

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Ames Laboratory	FY2019-KKOV	Rational Synthesis of Novel Non-Centrosymmetric Tetrel-Pnictide Intermetallics	10/1/2018	9/30/2020		0	157,011	157,011
Ames Laboratory	FY2019-LZHO	Controlling Magnetic Skyrmion, quasiparticles which have been predicted theoretically and observed experimentally in condensed matter systems, with External Strain	10/1/2018	12/31/2020		0	190,240	190,240
Ames Laboratory	FY2019-MBRY	Integrating cloud computing and the internet-of-things into a scientific work flow	3/1/2019	2/27/2022		0	42,750	42,750
Ames Laboratory	FY2019-MPER	New organolanthanide molecular quantum materials are within reach. Computationally study a series of new organolanthanide molecular quantum materials to help predict the effect on magnetic properties resulting from modifications to the lanthanide metal center or the ligands	1/2/2018	12/31/2020		0	129,743	129,743
Ames Laboratory	FY2019-NNUS	Development of Quantum Sensor based on single spins in diamond for quantum materials research	1/1/2019	9/30/2020		0	132,881	132,881
Ames Laboratory	FY2019-TKOB	Ultra-low Temperature Dynamic Nuclear Polarization Nuclear Magnetic Resonance Spectroscopy	10/1/2018	9/30/2020		0	75,379	75,379
Ames Laboratory	FY2019-TPRO	Development of Novel Correlative Approach to Analysis of Organic-Inorganic Interfaces. The project combines non-destructive high-resolution Analytical Electron Microscopy with (destructive) Atom Probe Tomography to provide a comprehensive understanding of role of organic/inorganic interfaces, including the elusive "buffer layer", thereby addressing a gap in their characterization.	10/1/2018	9/30/2020		0	8,700	8,700
Ames Laboratory	FY2020-FPER	Observing the Order and Dynamics of Heterogeneous Catalysts through Advanced Multidimensional Solid-State Nuclear Magnetic Resonance	10/1/2019	9/30/2020		0	46,326	46,326
Ames Laboratory	FY2020-FZHA	Precision synthesis of ordered functional materials through adaptive gradient processing	5/15/2020	9/30/2020		0	84,260	84,260
Ames Laboratory	FY2020-GAKO	Exploration of Complex Metal Pnictides Containing Refractory Metalloids, Boron and Carbon	10/1/2019	9/30/2021		0	224,971	224,971
Ames Laboratory	FY2020-INLE	Extracting of Lithium from Batteries via Accelerated Plating	6/10/2020	9/30/2020		0	65,248	65,248
Ames Laboratory	FY2020-ISLO	Catalytic Recovery of Ammonia from Agricultural Waste Streams	6/1/2020	9/30/2020		0	56,230	56,230
Ames Laboratory	FY2020-LQI	Algorithm-Enabled Smart and Autonomous Manufacturing of Chemicals	8/20/2020	7/31/2022		0	53,379	53,379
Ames Laboratory	FY2020-MKOL	Growth of Two - Dimensional materials by Graphene Intercalation	8/1/2020	7/31/2022		0	35,852	35,852
Ames Laboratory	FY2020-TPRO	Exploring the mobility, complexation, and clustering of rare earth elements in micas and synthetic layered silicates	5/15/2020	4/30/2021		0	88,129	88,129
Ames Laboratory	FY2020-VANT-01	Ab initio control of spin quantum noise	5/15/2020	9/30/2021		0	42,453	42,453
Ames Laboratory	FY2020-WHUA	Scaling-up Catalytic Process for Upcycling Waste Plastics	6/1/2020	9/30/2021		0	75,597	75,597
Ames Laboratory	FY2020-YMUD	Informed Discovery of Rare-Earth Materials	7/13/2020	9/30/2022		0	29,840	29,840
Argonne National Lab	2018-002	Development of a Hard X-ray Spectrometer Based on Transition Edge Sensors for Advanced Spectroscopy	4/1/2018	9/30/2020		0	175,250	175,250
Argonne National Lab	2018-016	Development of Zoom Optics Using Deformable Mirrors with in situ Wavefront Sensing and a Closed-loop Control System	1/1/2018	9/30/2020		0	189,506	189,506
Argonne National Lab	2018-019	Atomistically Informed Coherent Diffraction Imaging	10/1/2017	9/30/2020	N/A	0	93,329	93,329
Argonne National Lab	2018-027	Dark-Field Imaging of Multiscale Structures and Their Role at Phase Transition, Hysteresis, and Relaxation, Tuned by Magnetic Field and Temperature	3/1/2018	9/30/2020		0	249,290	249,290

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Argonne National Lab	2018-028	Integrated Approach to Unravel Four Dimensional Spatiotemporal Correlation in Highly Transient Phenomena: Ultrafast X-ray Imaging and High-Performance Computing	10/1/2017	9/30/2020	N/A	0	301,965	301,965
Argonne National Lab	2018-030	Novel Capabilities for Ultra-fast and Ultra-low-dose Three-dimensional Scanning Hard X-ray Microscopy	10/1/2017	9/30/2020	N/A	0	302,554	302,554
Argonne National Lab	2018-051	High-Efficiency, Low-cost Oxygen Reduction Reaction and Oxygen Evolution Reaction Catalysts Derived from Metal-Organic Frameworks	10/1/2017	9/30/2020	N/A	0	158,157	158,157
Argonne National Lab	2018-052	Exploring Lossy Quantum Computation	1/1/2018	9/30/2020		0	215,597	215,597
Argonne National Lab	2018-053	A High Pressure Xenon Gas Time Projection Chamber for Next Generation Neutrinoless Double Beta Decay Search Experiments	10/1/2017	9/30/2020	N/A	0	196,106	196,106
Argonne National Lab	2018-054	Development of a Compact 352-Megahertz High Efficiency Solid State Radio-frequency Amplifier System Utilizing Enhanced Digital Control	4/1/2018	9/30/2020		0	252,503	252,503
Argonne National Lab	2018-055	Variability and Trends in Land Surface Properties: Effects on boundary layer physics and Extremes Onset	12/1/2017	9/30/2020		0	139,227	139,227
Argonne National Lab	2018-058	Modeling and Quantifying Tradeoffs among Execution Time, Power, and Resilience of Parallel Application to Efficiently Exploit System Heterogeneity	1/1/2018	9/30/2020		0	382,121	382,121
Argonne National Lab	2018-089	Optimizing Urban Transportation Systems Energy Using Large-Scale Simulation and Machine Learning	5/1/2018	9/30/2020		0	196,726	196,726
Argonne National Lab	2018-097	Mission-Driven Unmanned Aerial System and Design Center. This project will establish a Mission-Driven Unmanned Aerial Systems Design Center bringing together critical resources and experience to address the interconnected technical challenges of energy consumption, noise, flight time, and payload by developing a tool to evaluate potential design options and optimizing the trade-offs through targeted aerodynamics design verification.	5/1/2018	9/30/2020		0	97,432	97,432
Argonne National Lab	2018-099	Syntheses and Evaluation of New Single Ion Electrolytes	6/1/2018	12/30/2020		0	234,843	234,843
Argonne National Lab	2018-100	High-Density Energy Storage in Solvent-Free Redox Flow Batteries for Flexible Electric Grid	6/1/2018	9/30/2020		0	239,130	239,130
Argonne National Lab	2018-104	Complex Fluids from Chemical Separations: A New Entry to Battery Electrolytes	6/1/2018	9/30/2020		0	216,991	216,991
Argonne National Lab	2018-105	Electrode Contamination Investigation to Advance Direct Recycling	7/1/2018	9/30/2020		0	77,743	77,743
Argonne National Lab	2018-109	High Precision Synthesis for Energy Conversion and Storage	5/1/2018	4/30/2021	N/A	0	240,168	240,168
Argonne National Lab	2018-110	Negative Capacitance in Ferroelectric Nanostructures	9/1/2018	5/31/2020		0	19,254	19,254
Argonne National Lab	2018-113	Precise Tailoring of an Electron Beam's Temporal Distribution	7/8/2018	6/30/2021		0	292,763	292,763
Argonne National Lab	2018-115	Health and Environmental Effects of Unconventional Natural Gas Development	7/1/2018	6/30/2021	N/A	0	(1)	(1)
Argonne National Lab	2018-118	Efficient Quantum Computing with Unreliable Quantum Hardware Facilitated by Lightweight Error Correction and Use of Multiple Quantum Processors	8/15/2018	7/31/2021		0	454,964	454,964
Argonne National Lab	2019-0004	Novel Methods for Three-Dimensional Integration of Superconducting Detectors and Readout	2/1/2019	9/30/2021		0	208,752	208,752

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Argonne National Lab	2019-0023	Novel Production of Theranostic Precious Metal Radionuclides at the Argonne Tandem Linear Accelerator System	10/1/2018	9/30/2020		0	136,855	136,855
Argonne National Lab	2019-0026	Establishment of an Electrospinning-based Nanofiber Manufacturing Platform using in situ Small Angle X-ray Scattering and Wide Angle X-ray Scattering Measurements	11/1/2018	9/30/2020		0	352,225	352,225
Argonne National Lab	2019-0028	Fast Current Modulation in Super Conducting Arbitrarily Polarizing Emitter Undulator for Fast Polarization Switching	11/1/2018	9/30/2020		0	255,229	255,229
Argonne National Lab	2019-0030	Probabilistic Forecasting of Extreme Weather Using Deep Learning	10/1/2018	9/30/2020		0	292,671	292,671
Argonne National Lab	2019-0034	Cooling the Cooler: Using Optical Stochastic Cooling to Prepare Cold Electrons for Cooling Hadrons in the Electron-Ion Collider	11/1/2018	9/30/2020		0	96,287	96,287
Argonne National Lab	2019-0050	Horn-Coupled Detectors for Future Cosmic Microwave Background Experiments	11/1/2018	9/30/2020		0	151,383	151,383
Argonne National Lab	2019-0062	Maximizing Cluster Cosmology with Next Generation Cosmic Microwave Background Surveys	11/1/2018	9/30/2021		0	165,629	165,629
Argonne National Lab	2019-0098	The Cosmic Lab of the Future. We propose to develop a pilot project that will provide innovative services for data access, interactions, and analysis at different levels. We will focus on cosmological simulation data generated with our high-performance Hardware/Hybrid Accelerated Cosmology Code.	12/1/2018	9/30/2021		0	97,252	97,252
Argonne National Lab	2019-0103	High-Resolution Cosmology: Extending the Reach of Clustering Measurements	11/1/2018	9/30/2021		0	123,185	123,185
Argonne National Lab	2019-0108	High-Pressure Diamond Anvil Cell with Nitrogen-Vacancy Center Based Magnetometry. We propose to develop a novel instrument that will enable highly sensitive magnetization measurements in a diamond anvil cell by incorporating nitrogen vacancy centers into the diamond anvil cell and using microwaves to excite the nitrogen vacancy centers so that resonances can be optically detected.	1/1/2019	12/30/2020		0	268,762	268,762
Argonne National Lab	2019-0109	Uncovering Dark Energy Physics through Forward-Modeling Galaxies into the Nonlinear Regime	11/1/2018	9/30/2021		0	180,172	180,172
Argonne National Lab	2019-0135	Atomic Synthesis of Artificial Lattices for Quantum Simulation	1/1/2019	9/30/2021		0	429,099	429,099
Argonne National Lab	2019-0157	Ultrafast Time-resolved Quantum Ghost Imaging	10/1/2018	9/30/2021	N/A	0	446,602	446,602
Argonne National Lab	2019-0202	Development and Application of Advanced Computing Technologies and Models for Hypersonic Combustion Applications	10/1/2018	9/30/2020		0	291,054	291,054
Argonne National Lab	2019-0205	Ion Transport in Heterogeneous Materials	11/1/2018	9/30/2020		0	707,397	707,397
Argonne National Lab	2019-0217	Establishing a Usable, Scalable, and Reproducible Computational Ecosystem for Dark Energy Science	1/1/2019	9/30/2021		0	171,246	171,246
Argonne National Lab	2019-0250	The Development of a High-throughput Mass Spec-based Method for Biocatalyst Engineering	10/1/2018	9/30/2020		0	196,072	196,072
Argonne National Lab	2019-0254	Near Real-Time Optimization of Manufacturing Processes via Machine Learning	10/1/2018	9/30/2020		0	332,492	332,492
Argonne National Lab	2019-0256	Advanced Characterization of Polytypic Silicon Carbide for Quantum Technologies	10/1/2018	9/30/2021	N/A	0	266,297	266,297
Argonne National Lab	2019-0258	Low-velocity High-gradient Accelerating Structures for Compact Carbon Therapy Linac	11/1/2018	9/30/2021	N/A	0	140,957	140,957
Argonne National Lab	2019-0259	MaterialEyes: A Reverse Image Search Tool for Materials Images	10/1/2018	12/30/2020		0	190,628	190,628

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Argonne National Lab	2019-0279	Develop Spectroscopy and Imaging Capabilities for Microfluidic Channels	10/1/2018	9/30/2020		0	192,634	192,634
Argonne National Lab	2019-0295	Universe as the Laboratory Mission-Critical Thin Film Materials. Our project will explore the applicability of novel thin-film synthesis techniques, such as ion-beam-assisted sputtering and impulse reactive magnetron sputtering, to improve our fundamental understanding and control of thin-film detector materials critical to the mission of Argonne's initiative called "The Universe Is Our Laboratory."	11/1/2018	9/30/2021		0	312,085	312,085
Argonne National Lab	2019-0300	Enabling Automatic Learning of Atmospheric Particles through the Advanced Photon Source Upgrade	10/1/2018	9/30/2020		0	214,989	214,989
Argonne National Lab	2019-0313	Neuromorphic Learning for Neuroimaging	10/1/2018	9/30/2020		0	140,834	140,834
Argonne National Lab	2019-0315	Developing Multiphoton-Lithography-based Three-Dimensional Nano-Printing: X-ray Corrective Lenses for the Advanced Photon Source Upgrade and Beyond	12/1/2018	9/30/2021		0	133,973	133,973
Argonne National Lab	2019-0328	Active Plasmonics using Epitaxial Thin Films of Dirac Semimetals. Our team will synthesize, pattern, and characterize plasmonic structures by using this novel class of materials, with the goal of enabling frequency-agile waveguides, sources, and high-sensitivity spectroscopic tools in the terahertz regime.	12/1/2018	9/30/2020		0	219,357	219,357
Argonne National Lab	2019-0330	Integrated Sensor Array and Modeling for Rapid Process Development in Chemical Vapor Deposition	11/1/2018	9/30/2020		0	78,369	78,369
Argonne National Lab	2019-0338	Advancing Pump-Probe X-ray Capabilities Toward the Advanced Photon Source Upgrade	12/1/2018	9/30/2021		0	211,578	211,578
Argonne National Lab	2019-0340	Design and Test Synthetic Pathways to Optimize their Effectiveness and Produce New Chemical Diversity	11/1/2018	9/30/2020		0	606,554	606,554
Argonne National Lab	2019-0349	Coherent Quantum Information Processing With Magnons Coupled Via Photons	4/1/2019	9/30/2021		0	230,496	230,496
Argonne National Lab	2019-0352	Macroscopic Quantum Entanglement Between Magnetization and Mechanical Motion	1/1/2019	12/31/2020		0	246,361	246,361
Argonne National Lab	2019-0358	A Scalable Toolkit for Noisy-Qubit Simulation	11/1/2018	9/30/2020		0	125,240	125,240
Argonne National Lab	2019-0360	Quantum State Engineering in Strong-Coupling Circuits using Floquet Theory	12/1/2018	9/30/2020		0	242,215	242,215
Argonne National Lab	2019-0375	Hybrid Quantum-Classical Computing Architectures. we are developing a hybrid quantum-classical computing program that leverages our classical supercomputing expertise. Many of the algorithms we are studying have applications relevant to Department of Energy missions.	1/1/2019	12/31/2020		0	251,015	251,015
Argonne National Lab	2019-0377	Long-Lived Erbium Qubits in Silicon-Based Semiconductor Materials. This erbium-on-silicon architecture enables scalable platforms for quantum information processing and storage.	2/1/2019	9/30/2020		0	239,056	239,056
Argonne National Lab	2019-0381	A Novel Readout for Large Arrays of Superconducting Nanowire Single Photon Detectors. We are developing a novel resonator-based readout for superconducting nanowire single photon detectors which are widely implemented as photodetectors for quantum information and sensing because of their low timing jitter, high quantum efficiency, and low dark count rate.	11/1/2018	9/30/2020		0	258,637	258,637

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Argonne National Lab	2019-0386	Mineralogy Inspires Physics. Mineralogical databases will be used to identify candidates for new quantum materials that display either quantum spin liquid behavior or unconventional superconductivity. By performing electronic structure calculations, which of these materials have the most potential to exhibit novel quantum behaviors for future studies will be identified.	1/1/2019	9/30/2020		0	346,322	346,322
Argonne National Lab	2019-0433	Coupling Data Science and in situ Multi-Modal Probes for Materials Synthesis. We choose the materials system to study here only to demonstrate the coupling of experimental, computational, and data science in order to develop a science of synthesis widely applicable to a universe of materials and their underlying formation and growth processes.	6/1/2019	9/30/2020		0	163,936	163,936
Argonne National Lab	2019-0438	Informed Images: X-ray Diffraction Vision for Fast Charging of Lithium Batteries	5/1/2019	3/31/2021		0	193,839	193,839
Argonne National Lab	2019-0441	Learning and differentiating: using Artificial Intelligence to image beyond the X-ray depth of focus limit	4/1/2019	3/31/2021		0	193,193	193,193
Argonne National Lab	2019-0442	Finding Critical Processes of Deformation in Structural Materials with Artificial Intelligence	5/1/2019	3/31/2021		0	210,906	210,906
Argonne National Lab	2019-0451	Artificial Intelligence guided metastable phase diagram of materials. We will move to synthesis through artificial intelligence and first-principles computations to discover metastable states and the locations of those states in phase space.	8/1/2019	3/31/2021		0	197,453	197,453
Argonne National Lab	2019-0453	Machine learning enabled advanced X-ray spectroscopy in the Advanced Photon Source Upgrade Era	4/1/2019	3/31/2021		0	245,403	245,403
Argonne National Lab	2019-0465	The Importance of Soil Water Content Heterogeneity for Determining Landscape Level Processes	4/1/2019	3/31/2022	N/A	0	283,483	283,483
Argonne National Lab	2019-0466	A User-Friendly Artificial Intelligence Software Toolkit for Molecular Modeling and Design of Quantum Materials	8/1/2019	9/30/2020		0	93,401	93,401
Argonne National Lab	2020-0009	Development of Accelerator for a Future Compact X-ray Laser	10/1/2019	9/30/2022	N/A	0	384,914	384,914
Argonne National Lab	2020-0012	Coded Apertures for Depth Resolved Diffraction	8/1/2020	9/30/2022		0	116,939	116,939
Argonne National Lab	2020-0020	Tomography at an Electron-Ion Collider: Unraveling the Origin of Mass and Spin	10/1/2019	9/30/2022	N/A	0	822,444	822,444
Argonne National Lab	2020-0038	A Workflow Combining the Use of Cryo-Nanoprobe and Cryo-Focused Ion Beam for High Resolution Three-Dimensional Imaging	8/1/2020	9/30/2022		0	23,032	23,032
Argonne National Lab	2020-0065	Conic Layered Focusing Optics for Nanometer Hard X-ray Spot Sizes	4/1/2020	9/30/2022		0	287,771	287,771
Argonne National Lab	2020-0071	Conic layered focusing optics for nanometer hard X-ray spot sizes	4/1/2020	3/31/2023		0	65,451	65,451
Argonne National Lab	2020-0090	Integration of a Wigner effect-based Energy Storage System with a Nuclear Micro-Reactor	10/1/2019	9/30/2021		0	280,204	280,204
Argonne National Lab	2020-0094	Enabling Predictive Simulations of Reacting Multiphase Flows via Data-Driven Emulation	11/1/2019	9/30/2021		0	263,086	263,086
Argonne National Lab	2020-0095	Micro Fission for Rest Stops	10/1/2019	9/30/2021		0	144,089	144,089
Argonne National Lab	2020-0108	Artificial Intelligence Assisted Safety Modeling and Analysis of Advanced Nuclear Reactors	10/1/2019	9/30/2021		0	205,729	205,729
Argonne National Lab	2020-0111	Printed Flexible Electronics for Highly Sensitive, Multiplexed, Miniaturized Biological/Chemical Integrated Sensors	10/1/2019	9/30/2021		0	379,591	379,591

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Argonne National Lab	2020-0112	Coupling a Self-Controlled Micro Reactor with Energy Storage System	10/1/2019	9/30/2021		0	283,506	283,506
Argonne National Lab	2020-0118	Low-Temperature Manufacturing of Durable Fiber-Reinforced Ceramic Composite Membranes	11/1/2019	9/30/2021		0	161,356	161,356
Argonne National Lab	2020-0126	Breakthrough Energy Storage Life Prediction which Enables Efficient Design Cycles via Machine Learning Analysis of Battery State of Health	10/1/2019	9/30/2021		0	331,022	331,022
Argonne National Lab	2020-0131	Scale-up of Multifunctional Membranes: Roll-to-Roll System Incorporating In Situ Monitoring and Machine Learning for Rapid Process Development	12/1/2019	9/30/2021		0	390,907	390,907
Argonne National Lab	2020-0145	Improved Large Scale Synthesis of Supported Catalysts	10/1/2019	9/30/2021		0	312,381	312,381
Argonne National Lab	2020-0148	Expedited Method for Development and Manufacturing of Advanced Fuel Cell Catalysts	11/1/2019	9/30/2021		0	339,804	339,804
Argonne National Lab	2020-0150	Advanced Empirical Technologies for Membrane Synthesis and Manufacturing	10/1/2019	9/30/2021		0	177,068	177,068
Argonne National Lab	2020-0152	Building Management Systems and Their Secure Inclusion Within Charging Infrastructure	11/1/2019	9/30/2022		0	125,819	125,819
Argonne National Lab	2020-0153	A Risk Assessment and Mitigation Framework for Fire Hazards Caused by Power Delivery Infrastructures	11/1/2019	9/30/2021		0	236,544	236,544
Argonne National Lab	2020-0162	An Additive Manufacturing Approach to On-Demand Single Photon Sources and Quantum Networks	11/1/2019	9/30/2022		0	3,408	3,408
Argonne National Lab	2020-0164	Accelerators Against Cancer	4/1/2020	9/30/2020		0	268,729	268,729
Argonne National Lab	2020-0165	Quantum Processors Based on Molecular Electron Spin Qubits	10/1/2019	9/30/2022	N/A	0	296,257	296,257
Argonne National Lab	2020-0166	Solid Electrolytes for Energy Storage	2/1/2020	1/31/2023	N/A	0	202,008	202,008
Argonne National Lab	2020-0167	In Situ Multi-Modal Study of Dynamic Surface State Passivation for High Quality Interfaces in Solar Energy Conversion and Quantum Computing	10/1/2019	9/30/2022	N/A	0	293,506	293,506
Argonne National Lab	2020-0168	Artificial Intelligence Robotics for Solution-Processable Materials	12/1/2019	9/30/2020		0	209,597	209,597
Argonne National Lab	2020-0169	Artificial Intelligence-driven Design of Controlled Phase Separation Mediated by Intrinsically Disordered Peptide Polymers	2/1/2020	9/30/2020		0	117,403	117,403
Argonne National Lab	2020-0170	Building an Autonomous Materials Discovery System for Metamaterials and the Associated Data Infrastructure	3/1/2020	9/30/2020		0	138,443	138,443
Argonne National Lab	2020-0171	Discovery of Novel Two-Dimensional Nanomaterials to Enable Optimum Gas and Water Sensing Performance in a Field-Effect Transistor Platform	4/1/2020	3/14/2023		0	205,636	205,636
Argonne National Lab	2020-0172	Computationally Evolved Two-Dimensional Peptide Assemblies	1/1/2020	9/30/2020		0	27,730	27,730
Argonne National Lab	2020-0173	Interlayer Films for Solid State Batteries	11/1/2019	9/30/2020		0	48,559	48,559
Argonne National Lab	2020-0174	Machine Learning Methods for Spectral Data from X-ray Transition Edge Sensor Arrays	2/1/2020	9/30/2020		0	24,109	24,109
Argonne National Lab	2020-0181	Advanced Method for Ultrahigh Sensitivity and Resolution At-Wavelength X-ray Optics Characterization	3/1/2020	9/30/2020		0	24,849	24,849
Argonne National Lab	2020-0182	In-situ Physics-of-Failure Analysis for Wide Bandgap Power Device for Aerospace and Defense Application	2/1/2020	9/30/2020		0	24,188	24,188
Argonne National Lab	2020-0185	In-situ Physics-of-Failure Analysis for Wide Bandgap Power Device for Aerospace and Defense Application	3/1/2020	2/28/2021		0	34,650	34,650
Argonne National Lab	2020-0194	Better Adversarial Machine Learning Through Robust Optimization	2/1/2020	9/30/2020		0	24,141	24,141
Argonne National Lab	2020-0196	Artificial Intelligence-based Local Downscaling of Global Coastal Flood Prediction	1/1/2020	9/30/2020		0	24,999	24,999

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Argonne National Lab	2020-0197	Statistics and Machine Learning to Enhance Reduced Order Models	2/1/2020	9/30/2020		0	24,606	24,606
Argonne National Lab	2020-0203	Modeling Dynamics of Complex Chemical Kinetics using Neural Ordinary Differential Equations	3/1/2020	9/30/2020		0	24,568	24,568
Argonne National Lab	2020-0204	Silicon and Germanium Delta-Doped Diamond Homoepitaxial Films	5/1/2020	9/30/2020		0	17,127	17,127
Argonne National Lab	2020-0205	Threadwork: A Framework for Representing the Relationships among Materials to Applications for the Hardware/Hybrid Accelerated Cosmology Code in the Area of Interconnects	2/1/2020	9/30/2021		0	177,713	177,713
Argonne National Lab	2020-0208	Low-Melting Oxide-Glass: A New Type of Solid-State Electrolytes	1/1/2020	9/30/2020		0	24,782	24,782
Argonne National Lab	2020-0214	Advanced Materials for Separations Technology via Electrospinning	2/1/2020	9/30/2020		0	39,428	39,428
Argonne National Lab	2020-0217	A Framework for Device and Architecture Co-Design via Hyperparameter Optimization and Backpropagation through Hardware	1/1/2020	9/30/2021		0	254,173	254,173
Argonne National Lab	2020-0218	Scalable Bayesian Calibration for Risk-Conscious Building Energy Modeling	2/1/2020	9/30/2020		0	2,414	2,414
Argonne National Lab	2020-0225	Evaluation of Precipitation Instrument Performance Across Rain Rates	2/1/2020	9/30/2020		0	21,243	21,243
Argonne National Lab	2020-0226	High-Energy X-ray Diffraction and Machine Learning Driven Molecular Dynamics Simulation Study of Molten Chloride Salts	2/1/2020	9/30/2020		0	36,353	36,353
Argonne National Lab	2020-0229	Developing Cathodes with Advanced Surface Treatment Towards Future Electron Sources	7/1/2020	9/30/2020		0	22,770	22,770
Argonne National Lab	2020-0230	Atom Scale Additive Nanofabrication for Microelectronics	4/1/2020	9/30/2021		0	265,060	265,060
Argonne National Lab	2020-0233	Advanced Algorithms for Optimizing Critical Infrastructure Systems Affected by High-Impact Rare Events	3/1/2020	9/30/2020		0	24,085	24,085
Argonne National Lab	2020-0250	High-Fidelity Multiphase Simulation of Steam Separators in a Light Water Reactor	4/1/2020	9/30/2020		0	48,174	48,174
Argonne National Lab	2020-0252	Slurry Based Flame Spray Pyrolysis for Catalyst Synthesis and Production	3/1/2020	9/30/2020		0	49,333	49,333
Argonne National Lab	2020-0253	Adaptive-Scale Multivariate Semi-Analytical Computation Approach for Transient Simulation of Networked Energy Systems in National Resilience Analysis	2/1/2020	9/30/2020		0	50,063	50,063
Argonne National Lab	2020-0269	Adsorption Strategies for Per- and Polyfluoroalkyl Substances	7/1/2020	9/30/2020		0	36,607	36,607
Argonne National Lab	2020-0270	Molecular Engineering of Field-effect Transistor Sensor for Ultrasensitive Detection of Per- and Polyfluoroalkyl Substances in Water	8/1/2020	9/30/2020		0	76,950	76,950
Argonne National Lab	2020-0271	Interoperability and Cybersecurity Assessment of Smart Charge Adapter	9/1/2020	9/30/2020		0	34,043	34,043
Argonne National Lab	2020-0279	Manufacture of Eco-Friendly Biomass-Based Plastic with Highly Reusable, Recyclable and Reproducible Properties	5/1/2020	9/30/2020		0	38,590	38,590
Argonne National Lab	2020-0281	Surrogate Fallout for Rad-Nuke Resuspension and Decontamination Studies	5/1/2020	9/30/2020		0	49,254	49,254
Argonne National Lab	2020-0284	Two-Dimensional Numerical Modeling of Tailings Dam Failures	5/1/2020	9/30/2020		0	49,049	49,049
Argonne National Lab	2020-0286	Incorporating Artificial Intelligence Capabilities to Support Critical Infrastructure Interdependency Analysis	7/1/2020	9/30/2020		0	46,701	46,701

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Argonne National Lab	2020-0290	Identify and Catalog Information Sources for Global Energy Security Database	8/1/2020	9/30/2020		0	39,070	39,070
Argonne National Lab	2020-0291	Millifluidic Optical Cell to Measure Uranium Hexafluoride Hydrolysis Reaction Dynamics	6/1/2020	9/30/2020		0	33,561	33,561
Argonne National Lab	2020-0298	Enhancing Capabilities of X-ray Diagnostics for Aerospace Propulsion	5/1/2020	9/30/2020		0	48,960	48,960
Argonne National Lab	2020-0300	Dichroic Ptychography for Mapping of Magnetic Domains and Orbital Anisotropies	5/1/2020	9/30/2020		0	49,513	49,513
Argonne National Lab	2020-0303	Artificial Intelligence Driven Development of a Compact Antimicrobial Resistance Prediction Platform Using the Cloud Lab	5/1/2020	9/30/2020		0	70,317	70,317
Argonne National Lab	2020-0304	Develop an Agent-Based Model Applicable for Simulating Coronavirus Disease Propagation and Interventions in an Urban Area	4/1/2020	9/30/2020		0	97,960	97,960
Argonne National Lab	2020-0471	Atmospheric Radiation Measurement program needs machine learning deployed to the edge	10/1/2019	9/30/2021		0	291,037	291,037
Argonne National Lab	2020-0473	Advanced Computing Expedition 2020	5/1/2020	9/30/2020		0	474,162	474,162
Argonne National Lab	2020-0474	Scalable Fabrication of Ortho-Mode Transducer-coupled millimeter-wave Bolometer Arrays	6/1/2020	9/30/2021		0	499,984	499,984
Argonne National Lab	P/ANL2017-093	Beehive: A Dynamic Execution Environment for Performance, Power, and Resilience on Extreme-Scale Computing Systems. We will develop a dynamic execution model, called "Beehive," that can balance performance, resilience, and power-awareness. The central idea of Beehive is based on over-decomposition. Beehive will utilize a combination of operating system and runtime techniques to expose such over-decomposition as distinct operating system processes. Thus, it will map almost directly to existing programming models and allow existing applications to benefit with minimal changes.	10/1/2016	3/31/2020	This is an LDRD project supporting a Named Fellow. The extension past three years is in support of maternity leave. The extension was approved by the Argonne DOE Site Office and DOE Headquarters on 2/14/19.	0	68,131	68,131
Argonne National Lab	P/ANL2017-157	Transport and Photophysical Processes in Hybrid Perovskites for Energy Applications. The focus of this project is to gain a fundamental understanding of the charge transport and photophysical characteristics in this emerging class of material, enabling further improvement of these materials for a variety of applications, such as in energy conversion and harvesting.	7/1/2017	6/30/2020	N/A	0	82,959	82,959
Argonne National Lab	P/ANL2017-158	Real-time Control of Urban Drainage Systems. This research will advance real time control of hydraulic systems by integrating hydraulic modeling with complex adaptive agent systems approaches, allowing for municipalities to diversify flow control capabilities and minimize the impact of combined sewer overflow events.	5/1/2017	4/30/2020	N/A	0	81,207	81,207
Brookhaven National Lab	BNL17-011	Engineered Protein Arrays for Structural and In-Operando Studies	6/1/2017	5/31/2020	N/A	0	37,788	37,788
Brookhaven National Lab	BNL17-015	National Synchrotron Light Source II High Brightness Upgrade Design Studies	2/1/2017	1/31/2020		0	77,257	77,257
Brookhaven National Lab	BNL17-016	Diffraction-limited and Wavefront Preserving Reflective Optics Development	5/1/2017	4/30/2020	N/A	0	82,228	82,228
Brookhaven National Lab	BNL17-023	Molecular Mechanisms of Alkane Hydroxylation	9/1/2017	8/31/2020	N/A	0	180,249	180,249
Brookhaven National Lab	BNL17-024	Development of a New Approach to Remotely Measure Limitations on Plant Growth	8/1/2017	7/31/2020	N/A	0	295,882	295,882

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Brookhaven National Lab	BNL18-002	Analysis on the Wire -Develop a hardware and software framework to enable specific forms of computation on streaming data while they are "on the wire," i.e., being transported in the network.	3/1/2018	2/28/2021	N/A	0	351,497	351,497
Brookhaven National Lab	BNL18-005	Provenance-enabled Sample Measurements and Tracking for Multi-modal Analysis and Predictive Synthesis	11/1/2017	10/31/2020	N/A	0	332,798	332,798
Brookhaven National Lab	BNL18-009	Visualization Toward White-Box Machine Learning for Image Registration in Multi-modal Imaging and Analysis	10/1/2017	9/30/2020	N/A	0	289,821	289,821
Brookhaven National Lab	BNL18-015	Operando Studies of Three-Dimensional Printing with Nanostructured Inks	12/1/2017	11/30/2020	N/A	0	91,284	91,284
Brookhaven National Lab	BNL18-017	Electrolyte Flow Battery for Smart Grid Application	4/1/2018	3/30/2021		0	583,881	583,881
Brookhaven National Lab	BNL18-020	Novel Development of Deep Learning and Radar Data Assimilation for Energy Resilience and Grid Reliability	3/1/2018	2/28/2021	N/A	0	154,950	154,950
Brookhaven National Lab	BNL18-026	Electron Beam Formation via Ionization Injection for Next Generation Accelerator Research and Development	7/1/2018	6/30/2021	N/A	0	132,455	132,455
Brookhaven National Lab	BNL18-033	Micro-pattern Gas Detectors. We intend to explore new technologies in all of these areas to develop a family of high-performance detectors with optimized spatial resolution, linearity of response and low channel count, as well as new software simulation tools, in order to improve the performance	2/1/2018	1/31/2021	N/A	0	367,362	367,362
Brookhaven National Lab	BNL18-036	Finding a Lifshitz Point with the Beam Energy Scan II	7/1/2018	6/30/2021	N/A	0	145,230	145,230
Brookhaven National Lab	BNL18-037	Forward and Backward Tracking at the Electron-Ion Collider Using Small Strip Thin Gap Chamber Detector	8/1/2018	7/31/2021	N/A	0	180,134	180,134
Brookhaven National Lab	BNL18-038	Ultra-fast High-Granularity Silicon Sensor Technology for Photon Science	3/1/2018	2/28/2021	N/A	0	278,344	278,344
Brookhaven National Lab	BNL18-039	Studying Confinement and Nuclear Structure through Correlations and Quantum Entanglement at an Electron-Ion Collider	7/1/2018	6/30/2021	N/A	0	181,132	181,132
Brookhaven National Lab	BNL18-044	Interplay of the Many Body Dynamics of Parton Spins with Gluon Saturation at Electron-Ion Collider	3/1/2018	2/28/2021	N/A	0	328,582	328,582
Brookhaven National Lab	BNL18-045	Jets at the Electron-Ion Collider. Collimated beams of sub-atomic hadrons called jets are a powerful diagnostic of the properties of matter produced at high energy colliders. This project explores the potential of jet measurements for a wide energy range at a future Electron-Ion Collider.	2/1/2018	1/31/2021	N/A	0	338,779	338,779
Brookhaven National Lab	BNL18-046	Enabling Sustainable Ammonia Synthesis through Ambient and High Pressure Synchrotron Techniques	10/1/2017	9/30/2020	N/A	0	172,594	172,594
Brookhaven National Lab	BNL19-001	Physics-Informed Autonomous Synthesis of Self-Assembling Materials. We propose to develop physics-informed autonomous synthesis for self-assembling materials. We will advance beyond existing work (by ourselves and other groups) by coupling the known physics of the material under study deeply into the autonomous experimental loop; in particular by using analytic field equations to capture equilibrium behavior, machine-learning approximants to estimate the role of non-equilibrium effects, and High Performance Computing modeling to capture the pathway-dependence of assembly.	5/1/2019	4/30/2022	N/A	0	305,115	305,115

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Brookhaven National Lab	BNL19-002	Physics-Guided Optimization of Quantum Gate Operations. We propose to study the optimization schemes that can reduce the number of gate operations while preserving the circuit outcome. This would in turn reduce the time required to perform certain critical algorithmic steps, analogous to a reduced number of Central Processing Unit instructions on a classical computer. We expect the optimization schemes to be explored, adjusted, and validated based on the underlying physics critical to quantum circuits.	2/1/2019	1/31/2022	N/A	0	331,473	331,473
Brookhaven National Lab	BNL19-003	Building an Integrative Forecast System to Address Challenges Facing Renewable Energy Forecast	6/1/2019	5/31/2022	N/A	0	338,027	338,027
Brookhaven National Lab	BNL19-008	Integrating Multimodal Experiments using Advanced Data Analytics Developed with Microscopic Theories for Quantum Materials	7/1/2019	6/30/2022	N/A	0	142,534	142,534
Brookhaven National Lab	BNL19-010	X-Ray Vision of Topological Bosons in Condensed Matter	12/1/2018	11/30/2021	N/A	0	176,164	176,164
Brookhaven National Lab	BNL19-013	In operando Imaging and Dynamics of Two-Dimensional High Temperature Superconductor Based, Dense Q-bit Arrays	9/1/2019	8/31/2022	N/A	0	139,477	139,477
Brookhaven National Lab	BNL19-014	Linking Experiments to Algorithms for Solving Single-Particle Cryo-Electron Microscopy Challenges	8/1/2019	7/31/2022	N/A	0	149,169	149,169
Brookhaven National Lab	BNL19-015	Triplet-Driven Solar Energy Capture	2/1/2019	1/31/2022	N/A	0	102,815	102,815
Brookhaven National Lab	BNL19-016	Demonstration of Feasibility of Sub-nanometer, Picosecond Electron Microscope for the Life Sciences	12/1/2018	11/30/2021	N/A	0	570,279	570,279
Brookhaven National Lab	BNL19-017	Beam Pipe Higher Order Mode Absorber	5/1/2019	4/30/2022	N/A	0	157,915	157,915
Brookhaven National Lab	BNL19-019	Varying Cross-Section Direct Wind Double Helix Coils	1/1/2019	12/31/2021	N/A	0	150,952	150,952
Brookhaven National Lab	BNL19-020	Cryo-Complementary Metal-Oxide-Semiconductor: Enabling Technology for Scalable Quantum Processors	11/1/2018	10/31/2021	N/A	0	326,397	326,397
Brookhaven National Lab	BNL19-021	Silicon Drift Detector with Internal Gain and Ultra-low Noise Charge Preamplifier for Single Photon Detection	4/1/2019	3/31/2022	N/A	0	380,139	380,139
Brookhaven National Lab	BNL19-022	Sensors and Electronics for Next-Generation Dark Energy Surveys	11/1/2018	10/31/2021	N/A	0	375,881	375,881
Brookhaven National Lab	BNL19-023	Development of Low Background Interconnections	2/1/2019	1/31/2022	N/A	0	373,514	373,514
Brookhaven National Lab	BNL19-024	Quantum Ultra-violet Sensors based on Superconducting Nanowire Single Photon Detector	4/1/2019	3/30/2022	N/A	0	207,729	207,729
Brookhaven National Lab	BNL19-026	Cathode Development and Deployment for Electron-Ion Collider	11/1/2018	10/31/2021	N/A	0	343,225	343,225
Brookhaven National Lab	BNL19-027	Real-time Particle Tracking with Deep Learning on Field Programmable Gate Arrays	8/1/2019	7/31/2022	N/A	0	307,591	307,591
Brookhaven National Lab	BNL19-028	High-Throughput Advanced Data Acquisition for Electron-Ion Collider, Particle Physics and Cosmology Experiments	7/1/2019	6/30/2022	N/A	0	386,970	386,970
Brookhaven National Lab	BNL19-029	Single Atom Barium -Identification for next Enriched Xenon Observatory using Electron Microscopy	4/1/2019	3/31/2022	N/A	0	378,689	378,689
Brookhaven National Lab	BNL19-030	Towards Stony Brook University – Brookhaven National Laboratory Scalable Quantum Processing and Network Enabled by Fast Imaging of Single Photons	10/1/2018	9/30/2021	N/A	0	398,209	398,209
Brookhaven National Lab	BNL19-035	Novel Approaches for Self-Assembly of Bio – Nanomaterials and Enabling their New Functions	2/1/2019	1/31/2022	N/A	0	189,731	189,731
Brookhaven National Lab	BNL20-002	Advancing Atmospheric Prediction Capabilities in Urban Areas for Energy Resiliency and National Security	12/1/2019	11/30/2022	N/A	0	187,144	187,144

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Brookhaven National Lab	BNL20-008	Power Efficient Plasma Device for removal of Polyfluoroalkyl Substances, 1,4-Dioxane and Other Contaminants of Emerging Concerns from Water Supply	1/1/2020	12/31/2022	N/A	0	185,971	185,971
Brookhaven National Lab	BNL20-010	Developing Sub-Picosecond Multi-Terawatt Carbon Dioxide Laser Capability	1/1/2020	12/31/2022	N/A	0	186,862	186,862
Brookhaven National Lab	BNL20-018	Building a Quantum Repeater Prototype Connecting Brookhaven National Laboratory to New York City	1/1/2020	12/31/2022	N/A	0	627,775	627,775
Brookhaven National Lab	BNL20-022	Topical Error Correcting Codes in the Noisy Intermediate-Scale Quantum Era	1/1/2020	12/31/2022	N/A	0	224,325	224,325
Brookhaven National Lab	BNL20-023	High-density Superconducting Interconnect for Quantum Control	11/1/2019	10/31/2022	N/A	0	190,374	190,374
Brookhaven National Lab	BNL20-024	Quantum Machine Learning for Dissipative Dynamics of Noisy Intermediate-Scale Quantum Devices	11/1/2019	10/31/2022	N/A	0	274,659	274,659
Brookhaven National Lab	BNL20-029	Unraveling the Elusive Active Site Structures of Membrane Bound Non-Heme Diiron Enzymes	4/1/2020	3/31/2023	N/A	0	24,198	24,198
Brookhaven National Lab	BNL20-030	Robust Physics-informed Machine Learning Applications in Spectro-imaging and Microscopy	6/1/2020	5/31/2022		0	112,973	112,973
Brookhaven National Lab	BNL20-031	Intelligent Quantum Dot Growbot for High Throughput Targeted Quantum Materials Discovery	6/1/2020	5/31/2023		0	119,177	119,177
Brookhaven National Lab	BNL20-032	Accelerating Materials Discovery with Total Scattering via Machine Learning	5/1/2020	4/30/2023		0	84,267	84,267
Brookhaven National Lab	BNL20-035	Storage Rings for Quantum Computing	12/1/2019	11/30/2021		0	187,562	187,562
Brookhaven National Lab	BNL20-036	Nanoscale Topological Insulators for Novel Quantum Materials	5/1/2020	9/30/2020		0	49,441	49,441
Brookhaven National Lab	BNL20-037	The Rice of the Future: How Growing Practices Can Decrease Human Exposure to Toxins	11/1/2019	10/31/2021		0	48,238	48,238
Brookhaven National Lab	BNL20-038	Machine Learning for Real-Time Data Fidelity, Healing, and Analysis for Coherent X-ray Synchrotron Data	5/1/2020	4/30/2023		0	83,466	83,466
Brookhaven National Lab	BNL20-039	Electrochemical Systems for Large Scale Energy Storage	12/1/2019	11/30/2022	N/A	0	420,896	420,896
Brookhaven National Lab	BNL20-040	Development of Machine Learning-based Capabilities for Aiding Data Analysis and Design of Sub-nanometer Catalysts	4/1/2020	9/30/2020		0	123,596	123,596
Brookhaven National Lab	BNL20-041	Conceptual Design Options for Future Upgrade of National Synchrotron Light Source II Facility	7/1/2020	6/30/2023		0	166,184	166,184
Brookhaven National Lab	BNL20-042	Marshalling Brookhaven National Laboratory's Expertise, Unique Facilities, and Other Key Science and Technology Resources in the Battle against Coronavirus Disease 2019	5/1/2020	9/30/2020		0	278,253	278,253
Brookhaven National Lab	BNL20-043	Designing Optimal Computational Campaigns for Complex Uncertain Systems	9/1/2020	9/30/2020		0	34,479	34,479
FERMI National Accelerator	FNAL-LDRD-2016-034	Instrumentation for the Initial set of Critical Scientific Experiments in Integrable Optics Test Accelerator and the Fermilab Accelerator Science and Technology Injector	11/26/2016	11/18/2019		0	(1,312)	(1,312)
FERMI National Accelerator	FNAL-LDRD-2017-003	Optical Microwave Kinetic Inductance Devices for future Cosmic Surveys	4/11/2017	4/3/2020		0	37,692	37,692
FERMI National Accelerator	FNAL-LDRD-2017-010	Training Deep Neural Networks for Neutrino Identification in the Cloud	3/27/2017	3/16/2020		0	369	369
FERMI National Accelerator	FNAL-LDRD-2017-011	Liquid Argon Charge Amplification Devices	12/11/2017	12/10/2021	This project relies on access to nano-f	0	24,899	24,899
FERMI National Accelerator	FNAL-LDRD-2017-014	Cryogenic photon sensors for the low mass frontier	6/11/2018	12/10/2021	This project includes procurement of	0	251,067	251,067
FERMI National Accelerator	FNAL-LDRD-2017-019	First demonstration of conduction cooled superconducting radio-frequency cavity	3/6/2017	2/28/2020		0	3,826	3,826
FERMI National Accelerator	FNAL-LDRD-2017-020	Development of next-generation niobium-3 tin superconductors for accelerator magnets	3/13/2017	3/12/2020		0	120,912	120,912

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FERMI National Accelerator	FNAL-LDRD-2017-038	Quantum computing using superconducting radio-frequency technology	3/28/2017	2/28/2020		0	(12,428)	(12,428)
FERMI National Accelerator	FNAL-LDRD-2018-003	A scintillating liquid argon bubble chamber for weakly interacting massive particles and coherent elastic neutrino nucleon scattering	4/20/2018	3/31/2021		0	218,500	218,500
FERMI National Accelerator	FNAL-LDRD-2018-006	Modeling Physical Systems with Deep Learning Algorithms	6/11/2018	6/4/2021		0	134,895	134,895
FERMI National Accelerator	FNAL-LDRD-2018-009	High Temperature Superconducting Magnet with Circular Coils	4/4/2018	3/26/2021		0	12,685	12,685
FERMI National Accelerator	FNAL-LDRD-2018-019	Broadband spectral sensitive graphene photodetector	6/25/2018	6/18/2021		0	1,985	1,985
FERMI National Accelerator	FNAL-LDRD-2018-020	Increasing the intensity of muon based experiments using wedge absorbers	3/15/2018	12/4/2020		0	43,432	43,432
FERMI National Accelerator	FNAL-LDRD-2018-025	Towards a Quantum Computing Science Center at Fermilab	5/14/2018	5/1/2021		0	139,281	139,281
FERMI National Accelerator	FNAL-LDRD-2018-037	Development of 10 kilogram Skipper Charge Coupled Device experiments	4/20/2018	4/16/2021		0	132,899	132,899
FERMI National Accelerator	FNAL-LDRD-2018-040	Dark Matter as Sterile Neutrinos Search Satellite	4/2/2018	3/26/2021		0	139,703	139,703
FERMI National Accelerator	FNAL-LDRD-2018-041	Quantum Networks Using Time-bin Photonic Qubits	7/16/2018	3/5/2021		0	34,488	34,488
FERMI National Accelerator	FNAL-LDRD-2018-049	A Quasi-Continuous Wave bunch-by-bunch H-Neutralization Laser System for Longitudinal Phase Collimation in Linacs and other Applications	5/14/2019	5/6/2022		0	51,743	51,743
FERMI National Accelerator	FNAL-LDRD-2018-052	Understanding Dark Matter with the Faintest Galaxies	9/9/2018	6/1/2021		0	596	596
FERMI National Accelerator	FNAL-LDRD-2018-053	Verification of Planck scale correlations in the reconfigured Fermi National Accelerator Laboratory Holometer	8/20/2018	11/2/2020		0	32,235	32,235
FERMI National Accelerator	FNAL-LDRD-2018-054	Single-electron experiments in the Fermilab Integrable Optics Test Accelerator ring - A small storage ring, the Integrable Optics Test accelerator is a 40-meter machine specifically designed to conduct accelerator physics research and will be capable of circulating electrons with energy of up to 150 mega-electronvolts. However, a single-electron mode of operation is not part of the Integrable Optics Test Accelerator commissioning plan, which focuses on bunches of 10 ⁹ electrons. This project would allow us to develop and commission a single-electron storage and detection capability.	8/10/2018	8/3/2020		0	6,745	6,745
FERMI National Accelerator	FNAL-LDRD-2019-010	Characterization and Development of Nanoscale Integrated Circuits for Quantum Systems and Deep Cryogenic Detectors	3/25/2019	3/24/2022		0	61,697	61,697
FERMI National Accelerator	FNAL-LDRD-2019-011	Pixel-Configurable Skipper Charge Coupled Devices for Cosmological Applications	5/27/2019	5/26/2022		0	68,847	68,847
FERMI National Accelerator	FNAL-LDRD-2019-017	Graph Neural Networks for Accelerating Calorimetry and Event Reconstruction	3/10/2019	3/9/2022		0	201,695	201,695
FERMI National Accelerator	FNAL-LDRD-2019-019	Accelerated superconducting magnet training by a Quench Current-Boosting device at quench current	3/10/2019	3/9/2022		0	217,887	217,887
FERMI National Accelerator	FNAL-LDRD-2019-020	Charge and Flux-insensitive Superconducting Quantum-bit Prototype	3/25/2019	3/24/2022		0	102,719	102,719
FERMI National Accelerator	FNAL-LDRD-2019-025	Quantum effects in undulator radiation	8/15/2019	3/3/2022	The proposal is to investigate the qua	0	67,390	67,390
FERMI National Accelerator	FNAL-LDRD-2019-027	Accelerator Control with Artificial Intelligence	4/8/2019	4/7/2022		0	207,435	207,435
FERMI National Accelerator	FNAL-LDRD-2019-031	Demonstration of the microwave quantum communication via "warm" channel between two ultracold quantum systems	4/8/2019	4/7/2022		0	165,820	165,820
FERMI National Accelerator	FNAL-LDRD-2019-033	Improving magnetic materials for Rapid Cycling Synchrotron cavity tuners	4/15/2019	4/14/2022		0	130,502	130,502

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FERMI National Accelerator	FNAL-LDRD-2019-039	Development of Microwave Readout Electronics for Massively Multiplexed Arrays of Transition-Edge Sensors	4/12/2019	4/11/2022		0	157,877	157,877
FERMI National Accelerator	FNAL-LDRD-2020-001	Superconducting undulator technology yoke development	3/1/2020	3/1/2022		0	83,357	83,357
FERMI National Accelerator	FNAL-LDRD-2020-005	Flexible array of accelerator magnet quench antenna channels for fast and precise quench detection and characterization	3/1/2020	2/28/2023		0	68,719	68,719
FERMI National Accelerator	FNAL-LDRD-2020-007	Development and Fabrication of 100 meter long iron based superconducting wires for High Field magnets	3/1/2020	2/28/2023		0	38,884	38,884
FERMI National Accelerator	FNAL-LDRD-2020-017	Development of a dedicated wake-building feedback system to study proton beam stability	3/1/2020	3/1/2022		0	32,711	32,711
FERMI National Accelerator	FNAL-LDRD-2020-020	Pion production target conceptual studies for considering an upgrade of the Fermi National Accelerator Laboratory Muon-to-Electron experiment	3/1/2020	2/28/2023		0	49,224	49,224
FERMI National Accelerator	FNAL-LDRD-2020-026	Accelerator-based dark matter initiatives at Fermilab	3/1/2020	2/28/2023		0	67,290	67,290
FERMI National Accelerator	FNAL-LDRD-2020-027	Study of liquid argon ultraviolet scintillation light detection with thin films of amorphous semiconductors	3/1/2020	2/28/2023		0	11,627	11,627
FERMI National Accelerator	FNAL-LDRD-2020-034	Developing small-pitch optical fiber positioners for massively parallel spectroscopy	3/1/2020	2/28/2023		0	11,185	11,185
FERMI National Accelerator	FNAL-LDRD-2020-035	Injection-molded plastic scintillator	3/1/2020	2/28/2023		0	40,484	40,484
FERMI National Accelerator	FNAL-LDRD-2020-037	Development of very thin-walled straws for an ultra-low mass charged particle detection system for future experiments in High Energy Physics	3/1/2020	2/28/2023		0	25,737	25,737
FERMI National Accelerator	FNAL-LDRD-2020-038	Development of Background-Limited Microwave Kinetic Inductance Detectors for Microwave Cosmology	3/1/2020	2/28/2022		0	35,326	35,326
FERMI National Accelerator	FNAL-LDRD-2020-039	A precision compass for the muon electric dipole moment	3/1/2020	2/28/2023		0	2,624	2,624
FERMI National Accelerator	FNAL-LDRD-2020-040	Developing electron-volt threshold microcalorimeters and single-photon detectors for low-mass dark matter searches	3/1/2020	2/28/2023		0	51,445	51,445
FERMI National Accelerator	FNAL-LDRD-2020-050	Numerical integration on graphical processing units	3/1/2020	2/28/2023		0	43,675	43,675
FERMI National Accelerator	FNAL-LDRD-2020-053	Software defined network architecture for quantum networks	8/17/2020	8/10/2023		0	5,652	5,652
FERMI National Accelerator	FNAL-LDRD-2020-055	Scalable cryo-electronics for beyond noisy intermediate scale quantum computing	8/17/2020	8/10/2023		0	45,669	45,669
FERMI National Accelerator	FNAL-LDRD-2020-056	Development of advanced superconducting undulator accelerator components	8/31/2020	8/24/2023		0	5,484	5,484
Idaho National Lab	I17P11-007FP	Coupling of Modeling and Experiment to Develop Predictive Models of the Mechanical Behavior of Nuclear Fuels and Materials	5/25/2017	4/30/2020		0	202,740	202,740
Idaho National Lab	I17P11-014FP	The influence of irradiation on the corrosion kinetics and hydrogen pickup of zirconium alloys	5/25/2017	4/30/2020		0	180,133	180,133
Idaho National Lab	I17P11-030FP	Investigation of Exciton Delocalization and Exciton Coherence in Chromophores and Acoustic Nanostructures	6/2/2017	5/30/2020		0	225,116	225,116
Idaho National Lab	I18A12-020FP	Real Time Transient Heating Measurements for Advanced Experiment Design and Model Validation	10/2/2017	1/31/2020	Several projects slated to hit the 36-m	0	227,403	227,403
Idaho National Lab	I18A12-029FP	Realizing Multidimensional Imaging and Machine Learning on the Scanning Transmission Electron Microscope	10/2/2017	9/30/2020		0	267,359	267,359
Idaho National Lab	I18A12-059FP	Modeling and Simulation for Nuclear Fuel Cycle Separations Using Modular Coupling	10/2/2017	9/30/2020		0	162,028	162,028
Idaho National Lab	I18A12-070FP	Electric Vehicle Wireless Charging Security	10/2/2017	9/30/2020		0	130,854	130,854
Idaho National Lab	I18A12-076FP	Novel Methods to Produce an Argon-37 Standard	10/2/2017	1/31/2021	Several projects slated to hit the 36-m	0	227,298	227,298

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Idaho National Lab	I18A12-080FP	Enabling Highly Scalable Multiphysics Simulation of Particulate Systems on Exascale Computing Architectures	10/2/2017	9/30/2020		0	327,639	327,639
Idaho National Lab	I18A12-082FP	Solvent Radiolysis Product Production using Preparative High Performance Liquid Chromatography	10/2/2017	9/30/2020		0	130,267	130,267
Idaho National Lab	I18A12-088FP	Thermomechanical Processing of Titanium Alloys for Improved Ballistic Performance	10/2/2017	9/30/2020		0	231,212	231,212
Idaho National Lab	I18A12-105FP	Advanced manufacturing for novel nuclear fuel and structural components	10/2/2017	1/31/2021	Several projects slated to hit the 36-m	0	519,219	519,219
Idaho National Lab	I18A12-107FP	Novel Synthesis of Neptunium Irradiation Targets Through Advanced Electrochemical Techniques	10/23/2017	9/30/2020		0	372,933	372,933
Idaho National Lab	I18A12-116FP	Boron Suboxide & Refractory Transition Metal Boride Fabrication by Spark Plasma Sintering	10/2/2017	1/31/2021	Several projects slated to hit the 36-m	0	730,665	730,665
Idaho National Lab	I18A12-130FP	Development of Advanced Three-Dimensional Printing Technologies for Cutting Edge Materials	10/2/2017	9/30/2020		0	155,104	155,104
Idaho National Lab	I18A12-131FP	Cyber-Secure Physical Layer Security in Millimeter Wave Communications	10/2/2017	9/30/2020		0	325,566	325,566
Idaho National Lab	I18A12-132FP	Dynamics of Multi-layer Complex Infrastructure Networks	10/2/2017	9/30/2020		0	149,319	149,319
Idaho National Lab	I18A12-150FP	Small scale tensile testing technique for measuring grain boundary strength of neutron-irradiated materials in focused ion beam systems	10/2/2017	9/30/2020		0	155,964	155,964
Idaho National Lab	I18A12-178FP	An Advanced Reactor Fuel Performance Tool Based on Coupled Bison (not acronym- name of which is a finite element-based nuclear fuel performance code) and Monte Carlo radiation transport code. The primary goal of the proposed work is to use the Multiphysics Object Oriented Simulation Environment and Multiphysics Object Oriented Simulation Environment wrapped application technology to couple Bison fuel performance code to the Monte Carlo radiation transport code.	10/2/2017	9/30/2020		0	217,354	217,354
Idaho National Lab	I18A12-201FP	Development of structural elements in Multiphysics Object-Oriented Simulation Environment	10/2/2017	9/30/2020		0	225,939	225,939
Idaho National Lab	I18A12-206FP	Development of an Advanced Method for Transient Reactor Test Facility Modeling and Simulation with Thermal Graphite Model Validation	10/2/2017	9/30/2020		0	322,400	322,400
Idaho National Lab	I18A12-210FP	Surface morphological patterning, structure-activity modeling, and aging analysis of catalyst materials to enhance oxidative dehydrogenation of ethane reaction conversion efficiency	10/2/2017	9/30/2020		0	270,210	270,210
Idaho National Lab	I18A12-212FP	High Performance Computing-based Dynamically Adaptive Protection Schemes for Electric Grid	10/2/2017	1/31/2021	Several projects slated to hit the 36-m	0	343,832	343,832
Idaho National Lab	I18A40-014FP	Accelerating irradiated fuel studies by advanced surrogate samples	7/23/2018	6/30/2021		0	45,984	45,984
Idaho National Lab	I18P37-001FP	In-Pile Investigation of Transient Boiling in the Transient Reactor Test Facility	5/16/2018	4/30/2021		0	1,101,127	1,101,127
Idaho National Lab	I18P37-007FP	Neutron Diffraction of Irradiated Nuclear Fuel	5/16/2018	5/31/2021	Several projects slated to hit the 36-m	0	455,292	455,292
Idaho National Lab	I18P37-008FP	Development of new experimental capability based on Focused Ion Beam micromachining and investigation of thermo-physical properties of nuclear materials at micro and mesoscale	5/16/2018	4/15/2021		0	243,137	243,137
Idaho National Lab	I18P37-030FP	Intelligent Additive Manufacturing	5/16/2018	5/30/2021	Several projects slated to hit the 36-m	0	462,291	462,291
Idaho National Lab	I18P37-031FP	Expanding photo-nuclear data via high-energy Linear Accelerator coupled with real time gaseous mass separation	5/16/2018	5/15/2021		0	673,762	673,762

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Idaho National Lab	I18P37-033FP	Robust Insulation For Resilient Transformers Against an Electromagnetic Pulse or Geomagnetic Disturbance	5/16/2018	4/30/2021		0	427,758	427,758
Idaho National Lab	I18P37-034FP	Ortho-phosphoric and/or phosphonic acid treatment of Aluminum cladding and Aluminum-fuel matrix spent nuclear fuel for long-term wet or dry storage technique development. The process uses orthophosphoric acid for the initial phosphotation and oxidation cleaning of a ships and yachts vessel's aluminum alloy surfaces. The result of the processes is the dissolution of the metal's surface followed by the formation of a hard and continuous precoat of aluminum phosphate on the surface of the Aluminum alloy. This is a preliminary treatment to develop a uniform protective layer in preparation for additional coatings, protection from seawater corrosion, and local penetration. This type of aluminum phosphate film is nearly chemically inert in the sea or freshwater and has very high thermal stability.	5/16/2018	9/30/2020		0	67,128	67,128
Idaho National Lab	I18P38-001FP	Radiation Chemical Kinetics of Actinide Redox Speciation	2/21/2018	9/30/2020		0	109,925	109,925
Idaho National Lab	I18P38-002FP	In-Situ Investigation of Bond-Structure and Local Chemistry in Molten Salts using Optical and Electrochemical Techniques	2/20/2018	9/30/2020		0	52,423	52,423
Idaho National Lab	I18P38-004FP	Feasibility Assessment of a Molten Salt Loop in the ATR (Deslonde DeBoisblanc Postdoctoral Award)	5/16/2018	4/15/2020		0	65,090	65,090
Idaho National Lab	I19A1045-017FP	Implementation of novel analytical procedures for quantification of fission products and impurities in nuclear fuels using a High Resolution Inductively Coupled Plasma Mass Spectrometer	4/25/2019	9/30/2020		0	94,827	94,827
Idaho National Lab	I19A39-012FP	Accelerated Nuclear Materials and Fuel Qualification by Adopting a First to Failure Approach	10/1/2018	9/30/2021		0	611,385	611,385
Idaho National Lab	I19A39-020FP	Liquid Scintillation Alpha Spectrometry for Nuclear Nonproliferation and Nuclear Forensics	10/1/2018	9/30/2021		0	247,620	247,620
Idaho National Lab	I19A39-023FP	An Innovative Secure millimeter wave Machine to Machine Communication Network for Operating Drones	10/1/2018	9/30/2021		0	434,540	434,540
Idaho National Lab	I19A39-024FP	Developing Multi-Scale, Rapid and Comprehensive Post-Irradiation Examination using the Focused Ion Beam Microscope	10/1/2018	9/30/2021		0	274,953	274,953
Idaho National Lab	I19A39-029FP	Seismic and Cost Assessment of Deeply Embedded or Buried Advanced Reactors with Seismic Isolation Strategies	10/1/2018	9/30/2021		0	418,118	418,118
Idaho National Lab	I19A39-056FP	Establishing Metrics for Measuring Firmware Construction Quality	10/1/2018	9/30/2020		0	48,107	48,107
Idaho National Lab	I19A39-059FP	Dissolution Phenomena of Used Nuclear Oxide Fuel in Molten Salt Systems	10/1/2018	9/30/2021		0	447,857	447,857
Idaho National Lab	I19A39-061FP	Determining the role of fission gas bubble pressure in fuel fragmentation during off-normal conditions: A separate effect study.	10/1/2018	9/30/2021		0	333,316	333,316
Idaho National Lab	I19A39-067FP	Multi-scale Modeling and Optimization of Additive Manufacturing Process for Nuclear Fuels	10/1/2018	9/30/2020		0	402,716	402,716
Idaho National Lab	I19A39-070FP	Moving beyond Displacements Per Atom: A new approach for rapidly quantifying radiation damage	10/1/2018	9/30/2021		0	361,873	361,873
Idaho National Lab	I19A39-071FP	Mitigating irradiation assisted stress corrosion cracking by rapid alloy design	10/1/2018	9/30/2021		0	620,919	620,919

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Idaho National Lab	I19A39-096FP	Effect of strong-coupled defects, structure, compositions and morphology of advanced energy materials on electrochemical performance: a case study of co-production of ethylene and specialty chemicals	10/1/2018	9/30/2021		0	432,881	432,881
Idaho National Lab	I19A39-099FP	A hyphenated separation technique for fuel analysis utilizing Gas Pressurized Extraction Chromatograph-Quadrupole-Inductively Coupled Plasma-Mass Spectrometer	10/1/2018	9/30/2020		0	269,098	269,098
Idaho National Lab	I19A39-100FP	Constituent Redistribution in Nuclear Fuels	10/1/2018	9/30/2021		0	370,130	370,130
Idaho National Lab	I19A39-103FP	Archiving Experimental Breeder Reactor-II Metallic Fuel Test Data Using Nuclear Data Management and Analysis System to Accelerate Fast Reactor Fuel Qualification	10/1/2018	9/30/2021		0	534,354	534,354
Idaho National Lab	I19A39-126FP	Electrochemical Co-Production of Ammonia and Ethylene using Ethane and Nitrogen at intermediate temperature (300-450 degrees Celsius)	10/1/2018	9/30/2020		0	351,810	351,810
Idaho National Lab	I19A39-130FP	Three-Dimensional Electrochemical Manufacturing and Sensing	10/1/2018	9/30/2021		0	437,336	437,336
Idaho National Lab	I19A39-137FP	Orthogonal frequency-division multiplexing -Compatible Underlay Communication Channel for Massive Machine-type Communications in fifth generation and Beyond	10/16/2018	9/30/2021		0	289,232	289,232
Idaho National Lab	I19A39-139FP	Carbon: Interfaces, structure and the impacts on performance	10/1/2018	9/30/2020		0	651,427	651,427
Idaho National Lab	I19A39-146FP	Design and Evaluation of a Nuclear Pumped Laser Detector for Reactor Power Indication	10/1/2018	9/30/2021		0	181,343	181,343
Idaho National Lab	I19A39-165FP	Task-Specific Ionic Compounds for In-Field Sample Preparation	10/1/2018	9/30/2020		0	195,470	195,470
Idaho National Lab	I19A39-185FP	Fundamental Liquid/Porous-Solid Interactions in High-Solids Slurry Processing	10/1/2019	9/30/2021		0	313,115	313,115
Idaho National Lab	I19A41-011FP	Generation and Radiolysis of Exotic Actinyl Oxidation States of Berkelium, Californium, and Einsteinium	2/18/2019	9/30/2020		0	48,556	48,556
Idaho National Lab	I19A41-025FP	Light Element Analysis of Nuclear Fuels by Electron Probe Micro Analysis	2/18/2019	9/30/2021		0	23,760	23,760
Idaho National Lab	I19A42-017FP	Development of a quantitative measurement technique for fission gas bubble pressure at nanoscale using advanced characterization and modeling techniques	2/18/2019	9/30/2020		0	63,521	63,521
Idaho National Lab	I19A42-024FP	Ontology for the Design of Innovative Nuclear Technologies	2/18/2019	9/30/2020		0	46,500	46,500
Idaho National Lab	I19P43-004FP	Studies of solubility and reactivity of fission products (Cesium, Isotope, Tellurium, and Barium) in primary sodium	2/18/2019	9/30/2020		0	93,755	93,755
Idaho National Lab	I19P43-006FP	Spectroscopic Studies of Covalency in Minor Actinide-Soft Donor Ligand Complexes	2/18/2019	9/30/2020		0	128,047	128,047
Idaho National Lab	I19P43-007FP	Optical Fiber-based Fabry-Perot Interferometry for Fission Gas Detection	2/18/2019	1/31/2021		0	83,506	83,506
Idaho National Lab	I19P43-009FP	Evaluating thermal properties of advanced materials	4/25/2019	9/30/2021		0	173,605	173,605
Idaho National Lab	I19P43-012FP	Probing Microstructure-induced Swelling and Thermal Property Changes in Ion-irradiated Oxide Fuels using Laser-generated Surface Acoustic Waves	5/1/2019	9/30/2021		0	109,195	109,195
Idaho National Lab	I19P43-013FP	Electronic and thermodynamic properties of selected uranium compounds at high magnetic fields	5/1/2019	9/30/2021		0	111,519	111,519
Idaho National Lab	I19P45-013FP	Intensified characterization and analysis of energy storage system to support integrated energy systems	3/7/2019	9/30/2021		0	991,207	991,207

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Idaho National Lab	I19P45-019FP	Beyond Nuclear Energy Materials: Utilizing Strong Spin Orbit Coupling and Topology in Actinides	3/26/2019	3/25/2022		0	60,702	60,702
Idaho National Lab	I19P45-020FP	Risk and Resilience Assessment of Cyberattacks on Electric Grids: Informing Risk Characterization using Dynamic Probabilistic Risk Assessment	3/25/2019	9/30/2021		0	548,389	548,389
Idaho National Lab	I19P45-028FP	Production of Scandium-47 for Potential Use as a Radiotheragnostic	5/1/2019	9/30/2020		0	516,845	516,845
Idaho National Lab	I19P45-031FP	Coupling of Spark Plasma Sintering with Advanced Modeling to Enable Process Scale-Up	5/7/2019	9/30/2021		0	485,371	485,371
Idaho National Lab	I20A1047-013FP	Coupled Multiphysics Simulation of Seismic Response of Degraded Concrete Dams	1/29/2020	9/30/2020		0	78,906	78,906
Idaho National Lab	I20A1047-015FP	Transient Spectrokinetic Reactor to Accelerate Development of Advanced Manufacturing Materials	1/23/2020	9/30/2021		0	104,771	104,771
Idaho National Lab	I20A1047-018FP	Innovative Materials and Coatings for Sweep Gas Membrane Distillation to Separate Bioethanol from Fermentation Broth	1/23/2020	1/22/2021		0	89,602	89,602
Idaho National Lab	I20A1047-025FP	Microalgae for Selective Concentration of Rare Earth Elements from Bioleachate Solutions	1/27/2020	9/30/2021		0	84,517	84,517
Idaho National Lab	I20A1047-029FP	Proton Recoil Effect on Light Output in Fast Neutron Scintillators	1/21/2020	1/22/2020		0	109,574	109,574
Idaho National Lab	I20A1047-034FP	A Longitudinal Finned Heat Exchanger for Subsurface Thermal Storage and Recovery	1/30/2020	8/1/2020		0	9,780	9,780
Idaho National Lab	I20A1047-038FP	Smart Contingency Analysis Neural Network for in-depth Power Grid Vulnerability Analyses	1/22/2020	1/23/2021		0	79,262	79,262
Idaho National Lab	I20A1047-039FP	Proof of Principle Experiments for a Pyrochemical Approach to Treatment of Used Advanced Test Reactor Fuel	1/21/2020	9/30/2021		0	79,374	79,374
Idaho National Lab	I20A1047-048FP	Additive Manufacturing Control of Defects	1/21/2020	9/30/2021		0	66,856	66,856
Idaho National Lab	I20A1049-002FP	Conception of an Enhanced Fast Neutron Test Capability in a Thermal Spectrum Reactor	4/3/2020	4/2/2021		0	90,726	90,726
Idaho National Lab	I20A1049-005FP	Detection of Cyber Physical Attack on Nuclear Compliance Monitoring Systems	4/16/2020	9/30/2020		0	109,506	109,506
Idaho National Lab	I20A1049-007FP	Macromolecule Radiolysis Using Radical Precursors	4/1/2020	3/31/2021		0	58,176	58,176
Idaho National Lab	I20A1049-008FP	Sensitive Methods for Organiodide Speciation	4/16/2020	4/15/2021		0	61,952	61,952
Idaho National Lab	I20A1049-012FP	Multiscale thermal properties prediction in the Multiphysics Object Oriented Simulation Environment via a general Boltzmann solver	4/3/2020	4/2/2021		0	42,109	42,109
Idaho National Lab	I20A1049-013FP	On-Demand Olefin Separations using Facilitated Transport Membranes	4/1/2020	9/30/2020		0	116,128	116,128
Idaho National Lab	I20A1049-015FP	Using Coupled Multiphysics Tools to Investigate Design-limiting Criteria for Molten Salt Reactors	4/1/2020	3/31/2021		0	83,190	83,190
Idaho National Lab	I20A1049-016FP	Fast, high resolution autoradiographic imaging of localized, small fission product containing samples for nuclear quality assurance, radiological emergency response, and nuclear forensics	3/31/2020	3/30/2021		0	45,289	45,289
Idaho National Lab	I20A1049-027FP	Investigation of Power Electronics and Control Systems for Nuclear/Renewable Energy Parks	4/1/2020	9/30/2020		0	128,130	128,130
Idaho National Lab	I20A1049-029FP	Solid State Chlorination of Waste Lithium Battery Scrap	4/1/2020	3/31/2021		0	40,484	40,484
Idaho National Lab	I20A1051-001FP	Dynamic Behavior of Nuclear Fuels in Hydrogen Coolant	3/24/2020	9/30/2020		0	212,628	212,628
Idaho National Lab	I20A1051-003FP	Rapid Design and Development of a Ventilator Exhaust Pathogen Deactivation Technology using Advanced Manufacturing Techniques	4/15/2020	9/30/2020		0	70,614	70,614

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Idaho National Lab	I20A1052-018FP	Ion-Solid Interactions in Focused Ion Beam/Secondary Ion Mass Spectrometry: Toward Nanoscale Trace Element and Isotopic Distribution Analysis in Irradiated Materials	7/8/2020	7/7/2021		0	25,727	25,727
Idaho National Lab	I20A1052-022FP	Heat Source Identification Using Inverse Optimization	7/16/2020	7/15/2021		0	61,615	61,615
Idaho National Lab	I20A1052-025FP	Development of an Innovative Testing Framework to Assess Crack Initiation Assisted by Corrosion-Fatigue	7/9/2020	7/8/2021		0	45,173	45,173
Idaho National Lab	I20A1052-027FP	Coordinated Examination of Microstructure and Thermal Properties of Gamma Uranium-zirconium Alloy in Volumetric Space	7/16/2020	7/15/2021		0	24,797	24,797
Idaho National Lab	I20A1052-028FP	Improving Cryptographic Algorithm Resistance to Side Channel Attack	7/9/2020	7/8/2021		0	35,059	35,059
Idaho National Lab	I20A1052-030FP	Ultrasonic fatigue lifetime measurements: A first step to developing a mechanistic understanding	7/14/2020	7/13/2021		0	30,844	30,844
Idaho National Lab	I20A44-003FP	Resilient Attack Interceptor for Intelligent Devices	10/1/2019	9/30/2022		0	213,533	213,533
Idaho National Lab	I20A44-011FP	Multi-Role High Entropy Alloys for Extreme Environments	10/1/2019	9/30/2022		0	247,450	247,450
Idaho National Lab	I20A44-025FP	Infrastructure expression	10/1/2019	9/30/2021		0	219,789	219,789
Idaho National Lab	I20A44-032FP	Protocol Analytics to enable Forensics of Industrial Control Systems	10/1/2019	9/30/2022		0	348,539	348,539
Idaho National Lab	I20A44-036FP	Demonstrate Viability of Accelerated Fuel Qualification Approaches	10/1/2019	9/30/2022		0	380,698	380,698
Idaho National Lab	I20A44-040FP	Switchable Solvent Water Extraction and Water Softening	10/1/2019	9/30/2021		0	612,573	612,573
Idaho National Lab	I20A44-041FP	Advanced Computational Modeling and Experimental Determination of the Thermophysical Properties of Molten Salt Systems applicable to Molten Salt Reactor Design	10/1/2019	9/30/2022		0	390,543	390,543
Idaho National Lab	I20A44-046FP	Combinatorial and High Throughput Materials Synthesis to Advance Nuclear Materials Discovery	10/2/2019	9/30/2022		0	544,121	544,121
Idaho National Lab	I20A44-050FP	A New Approach to Cathode Interface Structure/Activity with Transient Kinetics	10/1/2019	9/30/2021		0	228,419	228,419
Idaho National Lab	I20A44-058FP	Secure millimeter wave Spectrum Sharing with Autonomous Beam Scheduling	10/1/2019	9/30/2022		0	388,791	388,791
Idaho National Lab	I20A44-065FP	Advanced Manufacturing of Heat Pipes with Connectivity to Thermoelectrics	10/1/2019	9/30/2022		0	315,397	315,397
Idaho National Lab	I20A44-083FP	Fundamentals for the valorization of carbon dioxide towards integration to Nuclear Power Plants	10/1/2019	9/30/2022		0	490,454	490,454
Idaho National Lab	I20A44-089FP	Development of novel radiometal chelators for imaging and therapeutic nuclear medicine.	10/1/2019	9/30/2022		0	305,729	305,729
Idaho National Lab	I20A44-108FP	Automated Type and Data Structure Resolution	10/1/2019	9/30/2021		0	330,430	330,430
Idaho National Lab	I20A44-112FP	Real-time axial neutron flux profile measurement at the Advanced Test Reactor Critical facility	10/1/2019	9/30/2021		0	275,704	275,704
Idaho National Lab	I20A44-113FP	Additive Manufacture of multi-functional, large scale components	10/1/2019	9/30/2022		0	298,333	298,333
Idaho National Lab	I20A44-121FP	Modeling and characterization of alpha-uranium to accelerate metallic fuels development	10/1/2019	9/30/2022		0	283,439	283,439
Idaho National Lab	I20A44-126FP	Understanding salt chemistry and corrosion control of chloride salts for molten salt reactors	10/1/2019	9/30/2022		0	469,650	469,650
Idaho National Lab	I20A44-131FP	Direct integrated advanced manufacturing of multicomponent solid fuel systems with embedded sensors.	10/1/2019	9/30/2022		0	211,416	211,416
Idaho National Lab	I20A44-153FP	Development of a Streamlined Approach for Burnup and Microstructural Analysis of Nuclear Materials from Nanoscale to Mesoscale	10/1/2019	9/30/2021		0	329,255	329,255
Idaho National Lab	I20A44-155FP	Novel nanoindentation testing of creep properties for iron-chromium-aluminum alloy	11/6/2019	9/30/2022		0	294,458	294,458

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Idaho National Lab	I20A44-177FP	Develop High Fidelity Computation Models to Calculate the Effective Material Properties of Porous Cells	10/1/2019	9/30/2022		0	338,397	338,397
Idaho National Lab	I20A44-195FP	Automated Infrastructure & Dependency Detection via Satellite Imagery and Dependency Profiles	10/1/2019	9/30/2022		0	241,775	241,775
Idaho National Lab	I20A44-200FP	Flash Neutron Radiography at the Transient Reactor Test Facility to Examine Two-Phase Flow	10/1/2019	9/30/2022		0	363,143	363,143
Idaho National Lab	I20A44-203FP	Improving the Stability and Durability of Aptamer Based Smart-Materials Using Extremophiles.	11/6/2019	9/30/2021		0	239,894	239,894
Idaho National Lab	I20P1048-001FP	Probing in situ multi-property evolution during material processing using laser photoacoustics	11/25/2019	9/30/2021		0	118,518	118,518
Idaho National Lab	I20P1048-005FP	Development of a Simple Single Step Ultra Chemical Purification of Neptunium	4/28/2020	9/30/2021		0	99,915	99,915
Kansas City National Security	26361	Low Value Equipment Plant Directed Research Development Retort Furnace	2/25/2019	9/30/2020		-	213,113	213,113
Kansas City National Security	26390	Low Value Equipment Plant Directed Research Development Vapor Prime Oven	5/17/2019	9/30/2020		-	7,345	7,345
Kansas City National Security	26404	Low Value Equipment Plant Directed Research Development Spectrum Analyzer	5/24/2019	9/30/2020		-	263,392	263,392
Kansas City National Security	26421	Low Value Equipment Plant Directed Research Development Elite Auto	7/8/2019	9/30/2020		-	14,827	14,827
Kansas City National Security	26423	Low Value Equipment Plant Directed Research Development Glove box for Ceramic	6/27/2019	9/30/2020		-	50,655	50,655
Kansas City National Security	26427	Low Value Equipment Plant Directed Research Development Denton Desk	7/15/2020	9/30/2020		-	40	40
Kansas City National Security	26514	Low Value Equipment Sono-Tek (Company Name) Spray Pyrolysis	4/15/2020	9/30/2020		-	33,584	33,584
Kansas City National Security	26533	Low Value Equipment Polar Bear Plus GSM (Equipment Name) Versatile heating and cooling module	5/22/2020	9/30/2020		-	35,038	35,038
Kansas City National Security	26534	Low Value Equipment Universal Robotics (Company Name) UR5 (Arm Name)	6/2/2020	9/30/2020		-	43,030	43,030
Kansas City National Security	26535	Low Value Equipment Kardex (Company Name) Remstar (Equipment Name) Shuttle	5/28/2020	9/30/2020		-	89,856	89,856
Kansas City National Security	26538	Low Value Equipment Laser Source and Module	6/3/2020	9/30/2020		-	240,482	240,482
Kansas City National Security	26540	Low Value Equipment High Speed Camera System	6/12/2020	9/30/2020		-	34,615	34,615
Kansas City National Security	26541	Low Value Equipment Gocator 3504 (Snapshot Sensor Name)	6/16/2020	9/30/2020		-	20,966	20,966
Kansas City National Security	26544	Low Value Equipment Automatic Fusion	7/27/2020	9/30/2020		-	87,405	87,405
Kansas City National Security	26561	Low Value Equipment MFP-3D-Origin (Equipment Name) AtomicForce Microscopy	8/4/2020	9/30/2020		-	225,936	225,936
Kansas City National Security	26581	Low Value Equipment Photo Differential Scanning Calorimeter Attachment	8/19/2020	9/30/2020		-	50,059	50,059
Kansas City National Security	26582	Low Value Equipment Heidolph (Company Name) Carousel Reaction Station	8/21/2020	9/30/2020		-	17,970	17,970
Kansas City National Security	26583	Low Value Equipment HR 20 Discovery (Instrument Name) Hybrid Rheometer	8/20/2020	9/30/2020		-	154,697	154,697
Kansas City National Security	1021101	Capital Equipment Plant Directed Research Development EOS (company name) Ranger Selective Laser Sintering Printer	5/1/2018	9/30/2019		-	6,407	6,407
Kansas City National Security	1022701	Capital Equipment Plant Directed Research Development Research Platform	2/25/2019	9/30/2020		-	201,320	201,320
Kansas City National Security	1024901	Capital Equipment AJ5X 5Axis Aerosol Jet (Machine Name)	3/18/2020	9/30/2020		-	807,410	807,410
Kansas City National Security	24859E	Low Value Equipment _Fatigue Tester	11/13/2015	9/30/2020	Project did not exceed 3 years. This is	-	224	224
Kansas City National Security	25155	Low Value Equipment Excess 7201 Optomec Aerosol Jet (Machine Name)	7/21/2020	9/30/2020		-	6,708	6,708

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Kansas City National Security	26194	Low Value Equipment Plant Directed Research Development Grind and Mix Machine	10/1/2018	9/30/2020		-	81,833	81,833
Kansas City National Security	26388E	Low Value Equipment Fieldfox Portable Spectrum Analyzer	10/1/2019	9/30/2020		-	3,538	3,538
Kansas City National Security	26456	Low Value Equipment Deltech (Company Name) Furnace System	7/10/2020	9/30/2020		-	24,007	24,007
Kansas City National Security	26458	Low Value Equipment Entech (Company Name) Preconcentrator	5/12/2020	9/30/2020		-	47,941	47,941
Kansas City National Security	26459	Low Value Equipment Deep Learning Workstation	11/22/2019	9/30/2020		-	21,045	21,045
Kansas City National Security	26467	Low Value Equipment Pulse Pattern Generator	1/8/2020	9/30/2020		-	26,434	26,434
Kansas City National Security	26468	Low Value Equipment VarioScan (Company Name) Laser Optics	12/17/2019	9/30/2020		-	31,007	31,007
Kansas City National Security	26470	Low Value Equipment AON3D-M2 (Machine Name) Three Dimension Additive Manufacturing Printer	1/10/2020	9/30/2020		-	83,853	83,853
Kansas City National Security	26474	Low Value Equipment Metal Contamination Unit	2/17/2020	9/30/2020		-	21,766	21,766
Kansas City National Security	26476	Low Value Equipment ReactIR (Machine Name) Probe	2/17/2020	9/30/2020		-	35,401	35,401
Kansas City National Security	26487	Low Value Equipment Leica EM ACE600 (Machine Name) Sputter Coater	3/5/2020	9/30/2020		-	47,758	47,758
Kansas City National Security	26494	Low Value Equipment FaroArm (Machine Name) Quantum Axis	3/9/2020	9/30/2020		-	136,378	136,378
Kansas City National Security	26495	Low Value Equipment Box Desiccator Cabinet	3/10/2020	9/30/2020		-	3,345	3,345
Kansas City National Security	26500	Low Value Equipment Entech 3108D (System Name) Canister Cleaner	5/12/2020	9/30/2020		-	47,941	47,941
Kansas City National Security	26501	Low Value Equipment Bison (Company Name) 1000 DLP (Printer Name) Printer	4/7/2020	9/30/2020		-	23,707	23,707
Kansas City National Security	26502	Low Value Equipment Instron (Company Name) Advanced Video	4/2/2020	9/30/2020		-	54,369	54,369
Kansas City National Security	26536	Low Value Equipment Laser System Motion Controller	6/3/2020	9/30/2020		-	288,602	288,602
Kansas City National Security	26584	Low Value Equipment LabRAM II (Mixer Name) Acoustic Mix	8/24/2020	9/30/2020		-	64,444	64,444
Kansas City National Security	26586	Low Value Equipment 1800 Celsius Deltech Furnace	8/20/2020	9/30/2020		-	42,516	42,516
Kansas City National Security	26587	Low Value Equipment Deltech 1700 Celsius Furnace	8/20/2020	9/30/2020		-	24,007	24,007
Kansas City National Security	26588	Low Value Equipment Thickness Monitor	8/21/2020	9/30/2020		-	46,231	46,231
Kansas City National Security	26589	Low Value Equipment Lisa Sinterit PRO (Printer Name)	8/19/2020	9/30/2020		-	33,555	33,555
Kansas City National Security	26590	Low Value Equipment Tera hertz spectrometer from Bakman (Company Name)	8/19/2020	9/30/2020		-	67,789	67,789
Kansas City National Security	26593	Low Value Equipment Jubalo (Company Name) FL7006 (Pump Name) Recirculating Pump	8/26/2020	9/30/2020		-	21,983	21,983
Kansas City National Security	26595	Low Value Equipment Programming Computer	8/26/2020	9/30/2020		-	20,792	20,792
Kansas City National Security	26598	Low Value Equipment Profilometer/Microscope	8/31/2020	9/30/2020		-	123,162	123,162
Kansas City National Security	26601	Low Value Equipment Kistler Dynamometer	9/3/2020	9/30/2020		-	68,611	68,611
Kansas City National Security	704590x	Advanced Characterization and Predictive Modeling of the Test Cell	1/22/2014	9/30/2020	Project did not exceed 3 years. This is	-	5,797	5,797
Kansas City National Security	704775	Densification of Non-oxide Ceramics	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	(692)	(692)
Kansas City National Security	704777	Design and Manufacture of Cryogenic Systems	10/1/2016	5/7/2020	Project did not exceed 3 years. This is	-	702	702
Kansas City National Security	704784	Selective Laser Sintering Research and Development System	10/1/2016	7/14/2020	Project did not exceed 3 years. This is	-	(1,257)	(1,257)
Kansas City National Security	704789	Engineered Substrates with High Thermal Conductivity 7075 Aluminum Development for Electron Beam Melt	10/1/2016	8/5/2020	Project did not exceed 3 years. This is	-	3,624	3,624
Kansas City National Security	704800	Additive Manufacturing	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	3,394	3,394
Kansas City National Security	704804	X-Ray Analysis of Selective Laser Melting	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	35,306	35,306
Kansas City National Security	704806	Laser Oxidation for Wear Resistance and Lubrication	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	571	571

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Kansas City National Security	704814	Investigation of Conformal Cell Structures for Heat Transfer in Circular Pipes	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	1,885	1,885
Kansas City National Security	704820	Fixture Design and Damage Potential	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	26,601	26,601
Kansas City National Security	704827	Circular and Large Mass Reversible Helical Electromagnetic Launcher	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	(7,833)	(7,833)
Kansas City National Security	704831	Additive Manufacturing of Ceramic Composites	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	614	614
Kansas City National Security	704833	Non-contact Dimensional and Workmanship Inspection	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	(1,415)	(1,415)
Kansas City National Security	704837	Augmented Reality Advanced Inspection	10/1/2016	9/30/2020	Project Closed. This is a cost adjustment	-	70	70
Kansas City National Security	704842	Direct Write Electronics	10/1/2016	9/30/2020	Project Closed. This is a cost adjustment	-	56,763	56,763
Kansas City National Security	704843	Ceramic Additive Manufacturing Materials Characterization	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	(795)	(795)
Kansas City National Security	704844	Investigation of De-embedded Measurement Traceability	10/1/2016	9/30/2020	Project did not exceed 3 years. This is	-	(334)	(334)
Kansas City National Security	704852	Increasing Integrated Circuit Reverse Engineering Capabilities	10/1/2017	9/30/2019	Project did not exceed 3 years. This is	-	418	418
Kansas City National Security	704856	Future Glass Seals. University collaboration to assess laser heating of glass to formation of hermetic glass seals to 304L [Industry trade name].	10/1/2017	9/30/2020		-	1,278	1,278
Kansas City National Security	704870	Metal Filament Development	10/1/2017	9/30/2020		-	229,236	229,236
Kansas City National Security	704871	Hiperco Replacement - The scope of work for this project is to evaluate new materials in search of a replacement material for Hiperco (Iron-Cobalt). This project will develop an Integrated Computational Materials Engineering framework for the evaluation of magnetic and mechanical properties of materials, and leverage this framework to create new alloy designs for the purpose of similar magnetic performance to Hiperco, improved mechanical performance and other properties of interest.	10/1/2017	9/30/2020		-	392,855	392,855
Kansas City National Security	704880	Transport Phenomena. The comparison of theoretical models to experimental data for flow restriction	10/1/2017	9/30/2020		-	6,954	6,954
Kansas City National Security	704884	Active Record of Assembly Mistake Proofing	10/1/2017	9/30/2020		-	380	380
Kansas City National Security	704890	Trusted Additive Manufacturing	10/1/2017	9/30/2020		-	101,591	101,591
Kansas City National Security	704893	Tester Security - Identify Software/firmware/hardware in trusted base	10/1/2017	9/30/2020	This is a cost adjustment.	-	254	254
Kansas City National Security	704897	Multiaxial (6 degree of freedom) Vibration Test to Assess Durability of Electronic Systems and Components	10/1/2017	9/30/2020		-	207,142	207,142
Kansas City National Security	704898	Tailorable Resonant PlateShock	10/1/2017	9/30/2020		-	215,187	215,187
Kansas City National Security	704899	Validating New Instruments & Developing New Technology (Sounding Rockets)	10/1/2017	9/30/2020		-	368,739	368,739
Kansas City National Security	704903	Solid State Dual Neutron/X-Ray Detector Development	10/1/2017	9/30/2020		-	(144)	(144)
Kansas City National Security	704917	Automating Design for Manufacturability Analysis & Feedback	10/1/2017	9/30/2020		-	260,275	260,275
Kansas City National Security	704918	Augmented Reality Microscope. This project scope will investigate the capabilities of a reliable, accurate, and functional microscope integrated with augmented reality (Augmented Reality) technology. In more detail, the scope will only cover the physical components of the project and be integrated in such a way to successfully project an image/video within the microscope. This will easily allow the capability and functionality for Augmented Reality and deep learning in the future.	10/1/2017	9/30/2020		-	164,116	164,116

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Kansas City National Security	704919	Additively Manufactured Metals: A Continuing International Computational Materials Engineering approach at Kansas City National Security Campus	10/1/2017	9/30/2020		-	5,784	5,784
Kansas City National Security	704920	Investigation of Isogeometric Finite Element Analysis	10/1/2017	9/30/2020		-	375,707	375,707
Kansas City National Security	704921	Advanced Modeling and Simulations for Global Security Electronics X-Ray Inspection Shielding and Prediction	10/1/2017	9/30/2020		-	276,678	276,678
Kansas City National Security	704923	Simulation	10/1/2017	9/30/2020		-	24,579	24,579
Kansas City National Security	704927	Kansas City National Security Campus Policy Engagement and Training	10/1/2017	9/30/2020		-	101,483	101,483
Kansas City National Security	704928	Senior Design - Multiple universities require senior design projects in order for their engineering students to graduate. A call for projects was sent out to Honeywell Federal Manufacturing and Technologies employees, and engineers whose Plant Directed Research and Development projects were not selected were also approached and asked if it would be possible to rescope the project to be completed in a shorter amount of time by engineering students. All projects support Honeywell Federal Manufacturing and Technologies business in some way. These projects were sent out to Universities that we have partnered with in the past, and the projects selected by design teams will be completed with a Kansas City National Security Campus employee acting as a mentor to the senior design teams who selected their project.	10/1/2017	9/30/2020	Project closure/re-assignment to new	-	328,227	328,227
Kansas City National Security	704929	Innovation, Development, Experimentation, and Assessment Financial Year18	8/31/2017	9/30/2020	Project did not exceed 3 years. This is	-	(36)	(36)
Kansas City National Security	704933	Radar Consortium	10/1/2018	9/30/2020		-	2,122,573	2,122,573
Kansas City National Security	704934	Gallium Nitride Materials Research and Development	10/1/2018	9/30/2020		-	387,987	387,987
Kansas City National Security	704935	Programmable Device Data Extraction	10/1/2018	9/30/2020		-	327,220	327,220
Kansas City National Security	704936	Millimeter Wave Phased Array Modules	10/1/2018	9/30/2020		-	178,641	178,641
Kansas City National Security	704937	Submicron Photolithography	10/1/2018	9/30/2020		-	125,266	125,266
Kansas City National Security	704938	Efficient Ultrahigh Frequency Transmitter	10/1/2018	9/30/2020		-	(1,734)	(1,734)
Kansas City National Security	704941	Security Hardened Embedded Systems Counter-Measures	10/1/2018	9/30/2020	This is a cost adjustment.	-	159	159
Kansas City National Security	704944	Radiofrequency Remodulation	10/1/2018	9/30/2020		-	123,415	123,415
Kansas City National Security	704945	Electromagnetic Interference Susceptibility of Radio Frequency Integrated Circuits	10/1/2018	9/30/2020		-	456	456
Kansas City National Security	704946	Augmented Reality LookingGlass Transparent Identification	10/1/2018	9/30/2020		-	81,373	81,373
Kansas City National Security	704948	Logic Mapping and Focus Assist using Landslide susceptibility mapping	10/1/2018	9/30/2020		-	56,500	56,500
Kansas City National Security	704949	Three-Dimensional Printed Materials for Trust	10/1/2018	9/30/2020		-	26,304	26,304
Kansas City National Security	704950	Advanced Materials for Polymer Additive Manufacturing	10/1/2018	9/30/2020		-	790,233	790,233
Kansas City National Security	704951	Polymeric Nanocomposites	10/1/2018	9/30/2020		-	299,205	299,205
Kansas City National Security	704952	Material for Extreme Environment	10/1/2018	9/30/2020		-	573,735	573,735
Kansas City National Security	704953	Polymer Additive Manufacturing Material Feedstock	10/1/2018	9/30/2020		-	144,144	144,144
Kansas City National Security	704954	Laser Sintering	10/1/2018	9/30/2020		-	426,958	426,958
Kansas City National Security	704955	Ion Beam Assisted Thin Films	10/1/2018	9/30/2020		-	54,585	54,585
Kansas City National Security	704956	Variable Microwaves Alternative Cure	10/1/2018	9/30/2020		-	172,039	172,039
Kansas City National Security	704957	Diamond-like Composites	10/1/2018	9/30/2020		-	189,835	189,835
Kansas City National Security	704958	Metamaterial Radar and Supply Chain	10/1/2018	9/30/2020		-	229,387	229,387
Kansas City National Security	704959	Chip Slapper Process Enhance	10/1/2018	9/30/2020	Project did not exceed 3 years. This is	-	900	900

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Kansas City National Security	704960	Conformal Coating Tin Whiskers	10/1/2018	9/30/2020		-	220,853	220,853
Kansas City National Security	704961	Fuel Cell Feasibility	10/1/2018	9/30/2020		-	177,826	177,826
Kansas City National Security	704962	Atomic layer conformal coating	10/1/2018	9/30/2020		-	246,898	246,898
Kansas City National Security	704963	Two-Dimensional Electronic Material	10/1/2018	9/30/2020		-	414,608	414,608
Kansas City National Security	704965	Thin Film for Complex Shapes	10/1/2018	9/30/2020		-	53,996	53,996
Kansas City National Security	704966	Additive Manufacturing Composition Corrosion Advanced Aging	10/1/2018	9/30/2020		-	36,963	36,963
Kansas City National Security	704967	Wire-fed Electron Beam Additive Manufacturing Machine	10/1/2018	9/30/2020		-	806,163	806,163
Kansas City National Security	704968	Acceleration of Additive Manufacturing Chemistries	10/1/2018	9/30/2020		-	331,607	331,607
Kansas City National Security	704970	Frequency Inspection of Additive Manufacturing Parts	10/1/2018	9/30/2020		-	293,387	293,387
Kansas City National Security	704971	Advanced Support Removal Method. The scope of work for this project is to explore chemical methods to etch away and remove metal support structures from additively manufactured parts, which will save time and money from typical post-processing and also improve surface finish of the parts	10/1/2018	9/30/2020		-	244,511	244,511
Kansas City National Security	704972	Secure Assembly 2 (Classified)	10/1/2018	9/30/2020		-	400,294	400,294
Kansas City National Security	704973	Precision Machining Structures	10/1/2018	9/30/2020		-	130,140	130,140
Kansas City National Security	704974	Exploiting Collaborative Robot in Mechanism	10/1/2018	9/30/2020		-	169,942	169,942
Kansas City National Security	704975	Laminated Hiperco Prime Movers	10/1/2018	9/30/2020		-	600	600
Kansas City National Security	704976	Research Platform. Work with IPG Photonics (company name) to supply an open-architecture powder bed fusion additive manufacturing system.	10/1/2018	9/30/2020		-	126,627	126,627
Kansas City National Security	704977	Enhancements in heat exchanger	10/1/2018	9/30/2020		-	2,148	2,148
Kansas City National Security	704978	On Board Diagnostics Data Vehicle and Monitor	10/1/2018	9/30/2020		-	32,552	32,552
Kansas City National Security	704982	Collaborative Robotics	10/1/2018	9/30/2020		-	107,126	107,126
Kansas City National Security	704983	Secure Wireless Equip Sensors	10/1/2018	9/30/2020		-	121,502	121,502
Kansas City National Security	704984	Gallium Nitride Vibration Energy Harvester	10/1/2017	9/30/2020	Project did not exceed 3 years. This is	-	(92)	(92)
Kansas City National Security	704986	Safeguards Automatic Process Equipment	10/1/2018	9/30/2020		-	1,439	1,439
Kansas City National Security	704987	Radiofrequency Identification	10/1/2018	9/30/2020		-	33,247	33,247
Kansas City National Security	704989	Smart Surface Mount Technology Cleaning process	10/1/2018	9/30/2020		-	5,650	5,650
Kansas City National Security	704991	Application of Eye Tracking Technology	10/1/2018	9/30/2020		-	69,517	69,517
Kansas City National Security	704992	Miniature Mechanisms Testing - This will improve a) troubleshooting of other low margin tests and b) assist with identification of critical manufacturing parameters that will drive test results at higher levels.	7/1/2018	9/30/2020		-	83,712	83,712
Kansas City National Security	704993	Pick by Light System. Research Pick by Light Systems to meet Stores/National Nuclear Security Administration requirements.	10/1/2018	9/30/2020		-	181	181
Kansas City National Security	704994	Advanced Characterization of Additive Manufacturing Metals	8/30/2018	9/30/2020		-	176,601	176,601
Kansas City National Security	704995	Iowa State University Technical Fellowship	10/1/2018	9/30/2020		-	137	137
Kansas City National Security	704996	Auto Vehicle Design. In collaboration with the Bio Computation laboratory at the University of New Mexico this project targets research into physical Unmanned Autonomous Vehicles.	10/1/2018	9/30/2020		-	110,984	110,984
Kansas City National Security	705000	Improved Technical Agility	10/1/2018	9/30/2020		-	182,649	182,649
Kansas City National Security	705001	Distortion Analyses for Additive Manufacturing	10/1/2018	9/30/2020		-	28,155	28,155
Kansas City National Security	705002	Simulation Grain-level Laser Welding	10/1/2018	9/30/2019		-	220,049	220,049
Kansas City National Security	705003	Modeling Develop of Beta-Titanium	10/1/2018	9/30/2020		-	2,172	2,172
Kansas City National Security	705004	Additive Manufacturing Metal Cellular Structures	10/1/2018	9/30/2020		-	39,801	39,801
Kansas City National Security	705005	Polymer Constitutive Modeling	10/1/2018	9/30/2019		-	193,534	193,534
Kansas City National Security	705006	Model Based Quality Technology	10/1/2018	9/30/2020		-	380	380
Kansas City National Security	705007	Modeling, Aging, and Design Approach New Polymers	10/1/2018	9/30/2020		-	(6,930)	(6,930)

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Kansas City National Security	705009	Standard for the Exchange of Product Digital Authorization	10/1/2018	9/30/2020		-	(18,176)	(18,176)
Kansas City National Security	705011	Digital Protective Environment	10/1/2018	9/30/2020		-	263,221	263,221
Kansas City National Security	705012	Millimeter Wave Hazardous Imaging	10/1/2018	9/30/2020		-	382	382
Kansas City National Security	705015	Digital Radar Target Simulator	10/1/2018	9/30/2020		-	177,082	177,082
Kansas City National Security	705016	Test Engineering Modeling and Simulation	10/1/2018	9/30/2020		-	1,288	1,288
Kansas City National Security	705020	Smart System Ultra High Shock	10/1/2018	9/30/2019		-	288,116	288,116
Kansas City National Security	705021	FiscalYear19/FiscalYear20 Carryover Projects	10/1/2018	9/30/2019		-	165,683	165,683
Kansas City National Security	705022	Transmitter Surrogate	10/1/2019	9/30/2020		-	12,040	12,040
Kansas City National Security	705023	High Gravitational Acceleration Force and Programmable Shock	10/1/2019	9/30/2020		-	258,113	258,113
Kansas City National Security	705024	Evaluate the feasibility of existing vibration damage calculations within a system context	10/1/2019	9/30/2020		-	75,916	75,916
Kansas City National Security	705025	Second Order Effects Tester	10/1/2019	9/30/2020		-	160,661	160,661
Kansas City National Security	705026	Sensors for Rapid Acquisition of a Small Rocket	10/1/2019	9/30/2020		-	110,268	110,268
Kansas City National Security	705027	Electrical Chatter Testing - Open Principal Investigator Role	10/1/2019	9/30/2020		-	8,123	8,123
Kansas City National Security	705028	Cyber Physical Tester Security	10/1/2019	9/30/2020		-	68,160	68,160
Kansas City National Security	705029	Optical Measurement	10/1/2019	9/30/2020		-	387,106	387,106
Kansas City National Security	705030	Analytics for Tester Data	10/1/2019	9/30/2020		-	35,934	35,934
Kansas City National Security	705031	Deep Learning Assisted X-Ray Inspection	10/1/2019	9/30/2020		-	196,555	196,555
Kansas City National Security	705032	Tester 2025 Initiative	10/1/2019	9/30/2020		-	54,612	54,612
Kansas City National Security	705033	Polarization Depolarization Current / Time Domain Reflectometry Assembly Evaluation. (Possible Classification Implications)	10/1/2019	9/30/2020		-	5,766	5,766
Kansas City National Security	705034	Deep Neural Networks for Embedded Systems	10/1/2019	9/30/2020		-	2,737	2,737
Kansas City National Security	705035	Highly Accelerated Life Testing and Highly Accelerated Stress Screen hardware characterization study	10/1/2019	9/30/2020		-	128,877	128,877
Kansas City National Security	705036	Field Programmable Gate Array All-Programmable System on Chip	10/1/2019	9/30/2020		-	93,187	93,187
Kansas City National Security	705037	Distortion Analyses for Additive Manufacturing	10/1/2019	9/30/2020		-	230,724	230,724
Kansas City National Security	705038	Additive Manufacturing Metals: Integrated Computation Materials Engineering Approach	10/1/2019	9/30/2020		-	205,788	205,788
Kansas City National Security	705039	Electronics X-Ray Inspection	10/1/2019	9/30/2020		-	225,847	225,847
Kansas City National Security	705040	Full Field Dynamic Response	10/1/2019	9/30/2020		-	271,790	271,790
Kansas City National Security	705041	Sanitize Native Models for Digital Product Realization	10/1/2019	9/30/2020		-	146,362	146,362
Kansas City National Security	705042	Validation of Thermofluid Simulation	10/1/2019	9/30/2020		-	195,246	195,246
Kansas City National Security	705043	Sanitize Three Dimension Interactive Viewables for Digital Product Realization	10/1/2019	9/30/2020		-	75,058	75,058
Kansas City National Security	705044	Development of Beta-Titanium for Selective Laser Melting Year 2	10/1/2019	9/30/2020		-	8,989	8,989
Kansas City National Security	705045	Microstructure and Material Properties	10/1/2019	9/30/2020		-	95,680	95,680
Kansas City National Security	705047	Volume Data Recording Extended Reality Train	10/1/2019	9/30/2020		-	33,430	33,430
Kansas City National Security	705048	Trust Consortium	10/1/2019	9/30/2020		-	1,213,447	1,213,447
Kansas City National Security	705049	Additive Manufacturing Electronics Advancement	10/1/2019	9/30/2020		-	671,271	671,271
Kansas City National Security	705050	Secure LITE (Classified Project)	10/1/2019	9/30/2020		-	221,565	221,565
Kansas City National Security	705051	Physically Unclonable Function Noise Analysis	10/1/2019	9/30/2020		-	10,827	10,827
Kansas City National Security	705052	Advanced Micro Electronic Substrate Packaging	10/1/2019	9/30/2020		-	191,287	191,287
Kansas City National Security	705053	Fabricate Three Dimensional Modules	10/1/2019	9/30/2020		-	268,129	268,129
Kansas City National Security	705054	Memory Interrogation	10/1/2019	9/30/2020		-	254,499	254,499
Kansas City National Security	705055	Commercial Off The Shelf Software for Security	10/1/2019	9/30/2020		-	215,581	215,581
Kansas City National Security	705056	Rare Earth Magnet Alternatives	10/1/2019	9/30/2020		-	205,297	205,297
Kansas City National Security	705057	Next Generation Pore Formers	10/1/2019	9/30/2020		-	301,408	301,408
Kansas City National Security	705058	Next Generation Lightning Arrestor Connector Ceramics	10/1/2019	9/30/2020		-	197,854	197,854
Kansas City National Security	705059	Additive Manufacturing of Advanced Ceramics	10/1/2019	9/30/2020		-	378,718	378,718
Kansas City National Security	705060	Refractory Alloy Design	10/1/2019	9/30/2020		-	353,564	353,564

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Kansas City National Security	705061	Frangible Glass Development	10/1/2019	9/30/2020		-	353,491	353,491
Kansas City National Security	705062	New Polyurethane Development	10/1/2019	9/30/2020		-	383,184	383,184
Kansas City National Security	705063	Microstereolithography	10/1/2019	9/30/2020		-	75,245	75,245
Kansas City National Security	705064	Ultra High Temperature Ceramic	10/1/2019	9/30/2020		-	337,912	337,912
Kansas City National Security	705065	Metal Additive Manufacturing Post-Processing Coatings and Platings	10/1/2019	9/30/2020		-	60,904	60,904
Kansas City National Security	705066	Efficiency and Accurate testing for new mission work	10/1/2019	9/30/2020		-	39,435	39,435
Kansas City National Security	705067	Integrated Circuit Design for Printed Sensors	8/8/2019	9/30/2020		-	97,129	97,129
Kansas City National Security	705068	Radar Signal Processing	8/8/2019	9/30/2019		-	108,475	108,475
Kansas City National Security	705069	High Performance Recruiting	10/1/2019	9/30/2020		-	46,592	46,592
Kansas City National Security	705070	Developing Strengths	10/1/2019	9/30/2020		-	26,220	26,220
Kansas City National Security	705071	Microfluidics Consortium	10/1/2019	9/30/2020		-	403,820	403,820
Kansas City National Security	705072	Augmented Reality Collaboration	10/1/2019	9/30/2020		-	196,594	196,594
Kansas City National Security	705073	Pressure-Enhanced Selective Laser Melting	10/1/2019	9/30/2020		-	228,098	228,098
Kansas City National Security	705074	Characterization via Broadband Viscoelastic Spectrometer	10/1/2019	9/30/2020		-	141,911	141,911
Kansas City National Security	705075	Advanced Photon Source In Situ Monitoring Calibration	10/1/2019	9/30/2020		-	308,509	308,509
Kansas City National Security	705076	High Strain Rate Additive Manufacturing Materials	10/1/2019	9/30/2020		-	401,119	401,119
Kansas City National Security	705077	Material Risk Detection	10/1/2019	9/30/2020		-	175,760	175,760
Kansas City National Security	705078	In-Plant Tracking and Part Deoxyribonucleic Acid	10/1/2019	9/30/2020		-	193,460	193,460
Kansas City National Security	705079	Smart Surface-Mount Technology Cleaning Process	10/1/2019	9/30/2020		-	141,173	141,173
Kansas City National Security	705080	Active Design For Manufacturing Learning	10/1/2019	9/30/2020		-	76,072	76,072
Kansas City National Security	705081	Secure Augmented Training Head Mount Displays	10/1/2019	9/30/2020		-	51,142	51,142
Kansas City National Security	705082	Three Dimensional Automated Optical Inspection System Capability	10/1/2019	9/30/2020		-	35,058	35,058
Kansas City National Security	705083	Pick by Light System	10/1/2019	9/30/2020		-	74,794	74,794
Kansas City National Security	705084	Machine Capability Database	10/1/2019	9/30/2020		-	99,631	99,631
Kansas City National Security	705085	Drawing Requirement Extraction	10/1/2019	9/30/2020		-	52,536	52,536
Kansas City National Security	705086	In-situ Lathe Measurements	10/1/2019	9/30/2020		-	18,262	18,262
Kansas City National Security	705087	Augmented Reality Projection Mapping	10/1/2019	9/30/2020		-	145,405	145,405
Kansas City National Security	705088	Mixing of Solids and Liquids	10/1/2019	9/30/2020		-	63,328	63,328
Kansas City National Security	705089	Technology Assisted Workstation	10/1/2019	9/30/2020		-	40,273	40,273
Kansas City National Security	705090	Foam Removal with Water Blasting	10/1/2019	9/30/2020		-	125,200	125,200
Kansas City National Security	705091	User Interactions with Extended Reality Technology	10/1/2019	9/30/2020		-	126,009	126,009
Kansas City National Security	705092	Digital Frequency Memory Radio Frequency Delay Chassis	10/1/2019	9/30/2020		-	378,253	378,253
Kansas City National Security	705095	Ultrashort Pulse Laser Develop	10/1/2019	9/30/2020		-	854,254	854,254
Kansas City National Security	705096	Fiscal Year 20 Innovation, Development, Experimentation, and Assessment Projects	10/8/2019	9/30/2020		-	1,147,342	1,147,342
Kansas City National Security	705110	Financial Year18/19 Innovation, Development, Experimentation, and Assessment Carryover Project	8/1/2018	9/30/2019		-	(2,750)	(2,750)
Kansas City National Security	705111	FiscalYear19 Innovation, Development, Experimentation, and Assessment	10/1/2018	9/30/2019	Innovation, Development, Experimentation	-	239,529	239,529
L. Berkeley National Lab	LB18002	Toward Accurately Predicting California Hydroclimate by Cracking the Tropical Storm King	10/1/2017	9/30/2020		0	307,213	307,213
L. Berkeley National Lab	LB18004	In-situ Investigation of Chemical Precursor Transformation: Towards a Predictive Science of Synthesis	10/1/2017	9/30/2019		0	58,194	58,194
L. Berkeley National Lab	LB18007	A Neuroeconomics Experiment to Study Routine Transportation Decision-Making Processes and Drivers	10/1/2017	9/30/2019		0	140,629	140,629
L. Berkeley National Lab	LB18011	Isotopic Constraints on the Chemical and Thermal Conditions of Thermogenic Methane Formation	10/1/2017	9/30/2020		0	122,314	122,314
L. Berkeley National Lab	LB18013	Atomic Electron Tomography of Disordered Materials	10/1/2017	9/30/2019		0	38,003	38,003
L. Berkeley National Lab	LB18014	Agile Hybrid Materials for a Sustainable Future	10/1/2017	9/30/2020		0	280,944	280,944

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L. Berkeley National Lab	LB18020	Developing High-Resolution Optical Microscopy Methods for Imaging Plants and Microbes	10/1/2017	9/30/2020		0	274,616	274,616
L. Berkeley National Lab	LB18025	Unnatural Biosynthetic Pathways by Combining Biosynthetic Pathways with Artificial Metalloenzymes	12/7/2017	9/30/2020		0	312,396	312,396
L. Berkeley National Lab	LB18026	The Chemical Universe Through the Eyes of Generative Adversarial Neural Networks	12/7/2017	9/30/2019		0	206,596	206,596
L. Berkeley National Lab	LB18029	Diversity-Oriented Materials from Biogenic Feedstocks	12/7/2017	9/30/2019		0	194,254	194,254
L. Berkeley National Lab	LB18033	Ultrastable Superconducting Electron Microscope	6/1/2018	9/30/2019		0	191,971	191,971
L. Berkeley National Lab	LB18034	Computational Materials Discovery and Device Simulation	7/19/2018	9/30/2019		0	279,711	279,711
L. Berkeley National Lab	LB18035	Novel Electronic Nanostructured Materials for Low Power Electronics	7/19/2018	9/30/2019		0	284,160	284,160
L. Berkeley National Lab	LB18036	Post-Moore Architecture and Device Level Simulation and Exploration	7/19/2018	9/30/2019		0	274,178	274,178
L. Berkeley National Lab	LB18037	Understanding Fundamental Scientific Challenges in Scaling New Low Power Electronic Materials and Devices	7/19/2018	9/30/2019		0	283,151	283,151
L. Berkeley National Lab	LB18038	Improving Bioenergy Yield Under Drought Stress from Field to Lab	8/6/2018	9/30/2020		0	247,294	247,294
L. Berkeley National Lab	LB18039	Computational Design of Next Generation Materials for Quantum Sensing and Detection	8/20/2018	9/30/2020		0	274,390	274,390
L. Berkeley National Lab	LB19001	Qubit Synthesis Far from Equilibrium	10/1/2018	9/30/2020		0	248,108	248,108
L. Berkeley National Lab	LB19002	Fixed Field Magnets for Large Momentum Acceptance Ion Therapy Gantries	10/1/2018	9/30/2020		0	250,962	250,962
L. Berkeley National Lab	LB19003	A Self-Switching Metal-Insulator Coating for the Quench Protection of High-Temperature Superconducting Magnets	10/1/2018	9/30/2020		0	181,897	181,897
L. Berkeley National Lab	LB19004	"X-LAB": A System for Algorithmically Driven Synthesis of Semiconductors for Beyond Complementary Metal Oxide Semiconductor Technologies	10/1/2018	9/30/2020		0	258,686	258,686
L. Berkeley National Lab	LB19005	Developing New Hosts to Enable Effective Electrons-to-Biomass Conversion	10/1/2018	9/30/2020		0	240,130	240,130
L. Berkeley National Lab	LB19006	Laser-Accelerated Ion Beams: Evaluating Radiobiological Effects	10/1/2018	9/30/2020		0	276,842	276,842
L. Berkeley National Lab	LB19007	Managing Water Use to Reshape Electricity Loads: A User-Oriented Approach	10/1/2018	9/30/2020		0	254,653	254,653
L. Berkeley National Lab	LB19008	Climate and Hydrological Controls on Coastal Algal Blooms	10/1/2018	9/30/2020		0	290,536	290,536
L. Berkeley National Lab	LB19009	Enabling Energy-Water Decision Support Using Watershed-Scale Surrogate Models	10/1/2018	9/30/2020		0	298,080	298,080
L. Berkeley National Lab	LB19010	Multi-Tiered Iterative Projection Algorithms for Solving Inverse Problems for Imaging and Machine Learning	10/1/2018	9/30/2020		0	271,931	271,931
L. Berkeley National Lab	LB19011	Building and Benchmarking a Modular Deep Learning Framework for Encoding and Decoding Three-Dimensional Geometry of Atomic Systems	10/1/2018	9/30/2020		0	127,114	127,114
L. Berkeley National Lab	LB19012	Scalable Data Infrastructure for in-Field Experimental Instruments	10/1/2018	9/30/2020		0	159,023	159,023
L. Berkeley National Lab	LB19013	Statistical Mechanics for Interpretable Learning Algorithms	10/1/2018	9/30/2021		0	350,376	350,376
L. Berkeley National Lab	LB19014	Network Computing for Experimental and Observational Data Management	10/1/2018	9/30/2020		0	190,197	190,197
L. Berkeley National Lab	LB19015	Big Data Fusion for Smart and Sustainable Mobility	10/1/2018	9/30/2021		0	270,887	270,887
L. Berkeley National Lab	LB19016	Emerging TechnoEconomic Analysis	10/1/2018	9/30/2021		0	251,699	251,699
L. Berkeley National Lab	LB19017	Microbiology of Produced Water Recycling and Reuse	10/1/2018	9/30/2020		0	243,619	243,619

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L. Berkeley National Lab	LB19018	Platform for Services Exchange at the Edge of Low Inertia Grids	10/1/2018	9/30/2021		0	124,845	124,845
L. Berkeley National Lab	LB19019	Enabling Scalable High Temperature Energy Conversion and Storage with Novel Optical Spectroscopy	10/1/2018	9/30/2020		0	283,436	283,436
L. Berkeley National Lab	LB19020	Scanning Electron Beam Magnetic Probe	10/1/2018	9/30/2020		0	187,704	187,704
L. Berkeley National Lab	LB19021	Pore-Scale Investigation of Fracture Alteration in Multiphase Systems	10/1/2018	9/30/2020		0	281,143	281,143
L. Berkeley National Lab	LB19022	Engineering of Highly Selective Advanced Biogenics for Detection, Binding, and Control of Metal in the Environment	10/1/2018	9/30/2020		0	223,128	223,128
L. Berkeley National Lab	LB19023	Characterization of Biological 'Dark Matter'; Communities Through Integration of Metagenomics and Cryo-Electron Tomography Imaging	10/1/2018	9/30/2020		0	315,767	315,767
L. Berkeley National Lab	LB19024	Advanced Qubit Implementations	10/1/2018	9/30/2020		0	242,444	242,444
L. Berkeley National Lab	LB19025	Design, Synthesis, and Spectroscopic Studies of Photoactive Metal-Organic Frameworks for Solar Fuel Production	10/1/2018	9/30/2020		0	131,358	131,358
L. Berkeley National Lab	LB19026	Highly Efficient Advanced Thermal Energy Research for On-Demand Thermal Energy	10/1/2018	9/30/2021		0	296,737	296,737
L. Berkeley National Lab	LB19027	Density Fourier Transform Beyond Moore's Law: Extreme Hardware Specialization for the Future of High Performance Computing	10/1/2018	9/30/2020		0	271,388	271,388
L. Berkeley National Lab	LB19028	Ultrafast Electron Diffraction Studies of Quantum Materials	10/1/2018	9/30/2020		0	384,176	384,176
L. Berkeley National Lab	LB19029	Developing New Lattice Quantum Chromodynamic Methods for Neutrinoless Double Beta Decay and Nuclear Physics	10/1/2018	9/30/2021		0	224,983	224,983
L. Berkeley National Lab	LB19030	Enabling A Ton-Scale Germanium-76 Neutrinoless Double-Beta Decay Experiment	10/1/2018	9/30/2020		0	289,641	289,641
L. Berkeley National Lab	LB19031	Development of Integrated Frequency Domain Multiplexed Readout System for Next Generation Cosmic Microwave Background Experiment and Light Dark Matter Search Experiment	10/1/2018	9/30/2020		0	294,418	294,418
L. Berkeley National Lab	LB19032	Combining Data Driven and Science Based Generative Models	10/1/2018	9/30/2020		0	113,539	113,539
L. Berkeley National Lab	LB19033	The Duality of f-Electron Localization and Covalency in Lanthanide and Actinide Organometallics	10/1/2018	9/30/2020		0	152,313	152,313
L. Berkeley National Lab	LB19035	Correlation of Structural and Chemical Processes at Interfaces Under Operating Conditions Using Multimodal Ambient Pressure X-ray Photoelectron Spectroscopy and Surface X-ray Scattering	10/1/2018	9/30/2020		0	175,126	175,126
L. Berkeley National Lab	LB19036	Developing and Integrating Theoretical Modeling for Advanced Soft X-ray Spectroscopy of In-situ/Operando Electrochemistry	10/1/2018	9/30/2020		0	150,845	150,845
L. Berkeley National Lab	LB19037	Interactive Machine Learning for Tomogram Segmentation and Annotation	10/1/2018	9/30/2020		0	146,955	146,955
L. Berkeley National Lab	LB19038	Unmanned Aerial Vehicle-Mounted Passive ElectroMagnetic Sensor for Spatiotemporal Imaging of Shallow Subsurface Properties	10/1/2018	9/30/2021		0	222,941	222,941
L. Berkeley National Lab	LB19039	Preparing the Time Ordered Astrophysics Scalable Tools Cosmic Microwave Background High Performance Computing Framework for Cosmic Microwave Background-Stage 4 Data Synthesis and Reduction on National Energy Research Scientific Computing Center-9	10/1/2018	9/30/2021		0	322,767	322,767

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L. Berkeley National Lab	LB19042	Developing Third-Wave Machine Learning for the Biosciences	1/1/2019	9/30/2021		0	626,691	626,691
L. Berkeley National Lab	LB19043	Building Science-Based Methods to Quantify and Fortify Energy Resilience in Buildings	4/29/2019	9/30/2021		0	128,821	128,821
L. Berkeley National Lab	LB19044	Breakthrough High-performance Computational Solutions to Secure a Reliable Electric Vehicle-Connected Grid Future	7/1/2019	9/30/2019		0	284,743	284,743
L. Berkeley National Lab	LB19045	Approximate Unitary Matrix Decompositions for Quantum Circuit Synthesis	7/29/2019	9/30/2021		0	279,567	279,567
L. Berkeley National Lab	LB20001	Compact Laser-Based Positron Creation, Capture, and Cooling	10/1/2019	9/30/2021		0	155,192	155,192
L. Berkeley National Lab	LB20002	Designing Radio Frequency Cavity with Multi-Objective Genetic Algorithm	10/1/2019	9/30/2020		0	182,223	182,223
L. Berkeley National Lab	LB20003	Deep Learning Based Control for Ultrafast Lasers and Accelerators	10/1/2019	9/30/2021		0	289,412	289,412
L. Berkeley National Lab	LB20004	Electron Economical Carbon Dioxide Bioconversion	10/1/2019	9/30/2021		0	297,004	297,004
L. Berkeley National Lab	LB20005	AlphaBuilding: Machine Learning Based Advanced Building Controls	10/1/2019	9/30/2021		0	202,680	202,680
L. Berkeley National Lab	LB20006	Volatile Inference of Subsurface Interactions and the Biogeochemical Environment	10/1/2019	9/30/2021		0	196,865	196,865
L. Berkeley National Lab	LB20007	Process-Based Urban Hydro-Climate Modeling: Applications for Flood Risk Management and Ground Water Recharge in Cities	10/1/2019	9/30/2021		0	254,695	254,695
L. Berkeley National Lab	LB20008	Ultrafast Science Beyond Pump-Probe: Reconstructing Chemical Dynamics from Temporal Correlations in Multi-Pulse X-ray Spectroscopy	10/1/2019	9/30/2021		0	214,613	214,613
L. Berkeley National Lab	LB20009	Machine Learning with Advanced Feature Descriptors	10/1/2019	9/30/2021		0	197,381	197,381
L. Berkeley National Lab	LB20010	Network Dynamical Mechanisms Underlying Flexible and Self-Organized Brain Function	10/1/2019	9/30/2022		0	229,495	229,495
L. Berkeley National Lab	LB20011	Combining Probabilistic Graphical Models and Deep Learning to Advance Scientific Data Analysis	10/1/2019	9/30/2021		0	284,273	284,273
L. Berkeley National Lab	LB20012	Ionic Transport in Nanoconfined, Far-From-Equilibrium Fluids	10/1/2019	9/30/2021		0	123,494	123,494
L. Berkeley National Lab	LB20013	Deep Reinforcement Learning for Nondeterministic Polynomial Time-Complete Graph Problems in Scientific Computing	10/1/2019	9/30/2021		0	207,733	207,733
L. Berkeley National Lab	LB20014	Machine Learning through the Partial Differential Equation Lens: Design, Interpretability, and Efficiency	10/1/2019	9/30/2021		0	218,695	218,695
L. Berkeley National Lab	LB20015	Ion-Selective Inorganic Materials for Aqueous Environments	10/1/2019	9/30/2020		0	30,382	30,382
L. Berkeley National Lab	LB20016	Roots 2.0: Reimagining a Root System Optimized for Plant-Microbe Interactions	10/1/2019	9/30/2021		0	221,958	221,958
L. Berkeley National Lab	LB20017	Precision Manufacturing and Advanced Characterization of Optimized Solid-State Battery Components	10/1/2019	9/30/2021		0	228,629	228,629
L. Berkeley National Lab	LB20018	Low-Temperature Solution-Phase Synthesis of Sulfide Glass Composite Solid Electrolytes	10/1/2019	9/30/2021		0	283,844	283,844
L. Berkeley National Lab	LB20019	Ptychography of Diatoms	2/1/2020	9/30/2021		0	267,656	267,656
L. Berkeley National Lab	LB20020	Geoscience Quantum Sensing	10/1/2019	9/30/2021		0	313,317	313,317
L. Berkeley National Lab	LB20021	Extended Finite Volume Method for Coupled Processes in Complex Fractured Geological Systems	10/1/2019	9/30/2021		0	273,895	273,895
L. Berkeley National Lab	LB20022	Developing a Biological Three Dimensional Fabrication Platform for Synthesis of Complex Genome-Encoded Composites	10/1/2019	9/30/2021		0	290,919	290,919
L. Berkeley National Lab	LB20023	Organo-Ionic Frameworks as Solid-Ion Conductors with Tunable Chemomechanical Properties for Solid-State Batteries	10/1/2019	9/30/2021		0	253,988	253,988

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L. Berkeley National Lab	LB20024	Computational Tools for Extracting Macromolecular Conformational Dynamics from Diffraction and Imaging Data	10/1/2019	9/30/2021		0	157,510	157,510
L. Berkeley National Lab	LB20025	Tuning Interactions at Atomically Precise Interfaces for Controlling Quantum Coherent Phenomena in Nanoscale	10/1/2019	9/30/2021		0	273,862	273,862
L. Berkeley National Lab	LB20026	Modeling and Characterization of the Composite Cathode and Solid Electrolyte for All Solid-State Batteries	10/1/2019	9/30/2021		0	161,053	161,053
L. Berkeley National Lab	LB20027	Spatial-Temporal Imaging of Dirac Electron Dynamics	10/1/2019	9/30/2021		0	301,394	301,394
L. Berkeley National Lab	LB20028	Investigation of Interphase Formation Between Solid-State Electrolyte and Metal Anode	10/1/2019	9/30/2021		0	188,483	188,483
L. Berkeley National Lab	LB20029	Deep-Cryogenic Complementary Metal-Oxide-Semiconductor Application-Specific Integrated Circuit Development	10/1/2019	9/30/2021		0	347,723	347,723
L. Berkeley National Lab	LB20030	Extracting Quantum-Level Laws by Explainable Machine Learning and Automated Experiment Design	10/1/2019	9/30/2021		0	274,631	274,631
L. Berkeley National Lab	LB20031	Charm Physics with A Toroidal Large Hadron Collider Apparatus: From Charm Tagging to Measurements and Constraints on the Charm Parton-Distribution Function	10/1/2019	9/30/2022		-	123,188	123,188
L. Berkeley National Lab	LB20032	Exploring the Unknown Using the Higgs Boson with the A Toroidal Large Hadron Collider Apparatus Experiment at the Large Hadron Collider	11/1/2019	9/30/2022		-	123,144	123,144
L. Berkeley National Lab	LB20033	Fiber Robot Research and Development for Next Generation Dark Energy Research	10/1/2019	9/30/2021		-	193,468	193,468
L. Berkeley National Lab	LB20034	LightPix: Highly-Scalable Cryogenic Silicon Photomultiplier Readout Electronics for Neutrino Physics	10/1/2019	9/30/2021		-	182,179	182,179
L. Berkeley National Lab	LB20035	Field-Programmable Gate Array Based Network Processor Architectures and Applications Research	10/1/2019	9/30/2021		-	271,121	271,121
L. Berkeley National Lab	LB20036	Growth and In situ Characterization of Anisotropic Two Dimensional Layers and Heterostructures	11/17/2019	9/30/2021		-	145,558	145,558
L. Berkeley National Lab	LB20037	New Multiphysics Modeling of Next-Generation Electronic Devices	12/6/2019	9/30/2021		-	217,661	217,661
L. Berkeley National Lab	LB20038	Fiber Bragg Grating Sensors in Low and High Temperature Superconducting Magnets for Next Generation Particle Accelerators	5/1/2020	9/30/2020		-	46,123	46,123
L. Berkeley National Lab	LB20039	Deconvolving Social and Climatological Influences on Average Reproductive Number at the County Scale to Evaluate the Potential for Seasonal Cycles of Coronavirus-2019	5/1/2020	9/30/2021		-	101,839	101,839
L. Berkeley National Lab	LB20040	Accelerating Coronavirus-2019 Triage with Screening	5/1/2020	9/30/2021		-	113,060	113,060
L. Berkeley National Lab	LB20041	Aerosol and Indoor Air Quality Science to Strengthen the Understanding of Airborne Disease Transmission and Improve Guidance for Health Professionals and the Public	5/1/2020	9/30/2021		-	113,649	113,649
L. Berkeley National Lab	LB20042	Leveraging Knowledge Graphs and Machine Learning to Produce Actionable Knowledge for Coronavirus-2019 Response	5/1/2020	9/30/2020		-	115,965	115,965
L. Berkeley National Lab	LB20043	Coronavirus-2019 Scholar: Artificial Intelligence-Powered Rapid Data Gathering, Analysis, and Dissemination	5/1/2020	9/30/2021		-	114,633	114,633
L. Berkeley National Lab	LB20044	Non-Aqueous Flowable Electrodes for Enhanced Precious Metal and Nutrient Recovery from Chemical Waste and Concentrated Brine Solutions	5/1/2020	9/30/2020		-	77,294	77,294

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
L. Berkeley National Lab	LB20045	Microenvironments of Coronavirus-2019 in Droplets - Mass Spectrometry and Imaging with High Power Lasers	5/1/2020	9/30/2021		-	113,352	113,352
L. Livermore National Lab	17-ERD-010	Exploring Laser-Produced Relativistic Pair Plasma Jets	1/9/2017	4/8/2020	This project was extended because a	0	208,160	208,160
L. Livermore National Lab	17-ERD-029	Understanding Material Strength Variabilities and Uncertainties for Component Qualification	3/23/2017	3/22/2020		0	241,040	241,040
L. Livermore National Lab	17-ERD-031	Microbial Characterization of Combat-Patient Wounds to Improve Healing	3/21/2017	3/20/2020		0	225,800	225,800
L. Livermore National Lab	17-ERD-037	Rapid Closed-Loop Control of Additive Manufacturing with Machine Learning	11/30/2016	11/29/2019		0	43,970	43,970
L. Livermore National Lab	17-ERD-042	In Situ Diagnostics for Accelerated Fabrication and Manufacturing of Advanced Materials	3/20/2017	3/19/2020		0	217,470	217,470
L. Livermore National Lab	17-ERD-045	Probabilistic Predictions and Uncertainty Estimation for Radiological and Nuclear Effects Modeling	4/3/2017	4/2/2020		0	164,810	164,810
L. Livermore National Lab	17-ERD-059	Measuring Atmospheric Gas Using Small Satellites	10/1/2016	3/31/2020	This project was extended because th	0	61,070	61,070
L. Livermore National Lab	17-ERD-081	Simulations of Interpenetrating Plasmas	3/27/2017	6/26/2020	This project was extended because th	0	495,840	495,840
L. Livermore National Lab	17-ERD-117	A Quantitative Methodology for Measuring Cyber Risk to Critical Infrastructure	6/19/2017	6/18/2020		0	370,160	370,160
L. Livermore National Lab	17-ERD-118	Foams in Hohlräume	6/22/2017	6/21/2020		0	492,010	492,010
L. Livermore National Lab	17-ERD-119	Next-Generation Hohlräume for High Coupling Efficiency	5/26/2017	9/11/2020	This project was extended because of	0	316,660	316,660
L. Livermore National Lab	17-ERD-120	A Search for Intermediate-Mass Black Hole Dark Matter	5/26/2017	6/25/2020	This project was extended because of	0	272,000	272,000
L. Livermore National Lab	18-ERD-001	Accurate Temperature Determination from X-Ray Diffraction and Extended X-Ray Absorption Fine Structure Measurements	2/1/2018	4/30/2021	This project was extended because of	0	499,690	499,690
L. Livermore National Lab	18-ERD-002	High-Order Finite Elements for Thermal Radiative Transfer on Curved Meshes	10/1/2017	9/30/2020		0	504,270	504,270
L. Livermore National Lab	18-ERD-003	Next-Generation Debris Diagnostics	10/1/2017	6/30/2021	This project was extended because of	0	337,630	337,630
L. Livermore National Lab	18-ERD-004	Functional Photoresists for Energy Applications	10/1/2017	9/30/2020		0	830,570	830,570
L. Livermore National Lab	18-ERD-005	Anti-Reflective Meta-Surfaces for High-Power Lasers	10/1/2017	9/30/2020		0	513,010	513,010
L. Livermore National Lab	18-ERD-006	XPlacer: Extensible and Portable Optimizations of Data Placement in Memory	10/1/2017	9/30/2020		0	615,400	615,400
L. Livermore National Lab	18-ERD-007	Simulating Magnetized Particle Dynamics in Z-Pinch Plasmas	10/1/2017	9/30/2020		0	353,890	353,890
L. Livermore National Lab	18-ERD-008	Quantifying Uncertainties of Microscopic Nuclear Theories	10/1/2017	9/30/2020		0	198,210	198,210
L. Livermore National Lab	18-ERD-011	Longitudinal Monitoring of Ribonucleic Acid Content of a Live Cell with a Nanotube Pore Interface	10/1/2017	11/30/2020	This project was extended because of	0	391,320	391,320
L. Livermore National Lab	18-ERD-012	Probing Liquid Phases and f-Electron Systems at the Dynamic Compression Sector	10/1/2017	5/1/2021	This project was extended because of	0	401,540	401,540
L. Livermore National Lab	18-ERD-013	Developing Photonuclear Experimental Capabilities for Nuclear Science and Security	10/1/2017	9/30/2020		0	281,260	281,260
L. Livermore National Lab	18-ERD-014	X-Ray Optics Solutions for Studying Mesoscale Science	1/4/2018	9/30/2021	This project was extended because of	0	668,050	668,050
L. Livermore National Lab	18-ERD-015	Direct Measurement of Mass-Temperature Distributions in the Core of Implosions on the National Ignition Facility	10/1/2017	9/30/2020		0	252,270	252,270
L. Livermore National Lab	18-ERD-016	Pioneering Stable Isotope Signatures of Nuclear Proliferation	10/1/2017	9/30/2020		0	493,160	493,160
L. Livermore National Lab	18-ERD-017	Deep Multitask Learning for Predictive Oncology	10/1/2017	9/30/2020		0	573,510	573,510
L. Livermore National Lab	18-ERD-021	Methods for Explainable Artificial Intelligence	11/13/2017	11/12/2020		0	378,390	378,390
L. Livermore National Lab	18-ERD-024	Selective Removal of Ions from Aqueous Solutions	10/1/2017	9/30/2020		0	601,740	601,740
L. Livermore National Lab	18-ERD-025	Integration of Quantification of Margins and Uncertainties Methodology into Parallel Discrete Event Simulator Framework	10/1/2017	9/30/2020		0	19,980	19,980

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L. Livermore National Lab	18-ERD-027	Algebraic Multigrid Preconditioners for Scalable Simulation of Reservoir Geomechanics and Multiphase Flow	10/1/2017	9/30/2020		0	471,610	471,610
L. Livermore National Lab	18-ERD-028	The Next Breakthroughs in Neutrino Physics - We will explore detection schemes and a novel xenon production technique for use in next-generation experiments to uncover the underlying physics behind rare and subtle neutrino interactions. This research will have applications in nuclear reactor monitoring projects, forensics detection technology, and cross-section measurements relevant to national goals to reduce global nuclear security threats.	10/1/2017	12/30/2020	This project was extended because of	0	449,960	449,960
L. Livermore National Lab	18-ERD-029	Arbitrary Control and Characterization of Laser Waveforms and Interactions at Picosecond Resolution over Long Record Lengths	10/1/2017	9/30/2020		0	393,100	393,100
L. Livermore National Lab	18-ERD-031	Quantum Non-Equilibrium Dynamics of Electronic Transport in Nonlinear Regimes	10/1/2017	9/30/2020		0	421,790	421,790
L. Livermore National Lab	18-ERD-032	Porous Metals via Ice Templating	10/1/2017	11/13/2020	This project was extended because of	0	455,950	455,950
L. Livermore National Lab	18-ERD-033	Pressure Ionization in Ultra-High-Density Plasmas	10/1/2017	9/30/2020		0	374,670	374,670
L. Livermore National Lab	18-ERD-034	Construction of Genetic Sense-and-Respond Modules to Detect Viral Infection	10/1/2017	12/30/2020	This project was extended because of	0	443,640	443,640
L. Livermore National Lab	18-ERD-035	A Computational Approach to Improve Prediction of Off-Target Drug Binding Using Membrane Bilayer Effects	10/1/2017	9/30/2020		0	497,270	497,270
L. Livermore National Lab	18-ERD-038	Energy Scaling of Thin-Disk Lasers	10/1/2017	1/30/2021	This project was extended because of	0	373,910	373,910
L. Livermore National Lab	18-ERD-039	Predictive Modeling of Correlated Noise in Superconducting Circuits	10/1/2017	9/30/2020		0	417,450	417,450
L. Livermore National Lab	18-ERD-041	Stable Isotope Probing and Viromics: Quantifying Virus-Host and Carbon Cycling Dynamics in Soil with Isotope-Targeted Metagenomics	10/1/2017	12/30/2020	This project was extended because of	0	444,610	444,610
L. Livermore National Lab	18-ERD-042	Optical Interconnect for High-Density Neural Signals	10/1/2017	9/30/2020		0	424,540	424,540
L. Livermore National Lab	18-ERD-046	Plasma Photonics: Manipulating Light Using Plasmas	1/9/2018	1/8/2021		0	388,130	388,130
L. Livermore National Lab	18-ERD-049	Modeling Nuclear Cloud Rise and Fallout in Complex Environments	2/7/2018	2/6/2021		0	852,010	852,010
L. Livermore National Lab	18-ERD-052	Flash X-Ray Computed Tomography for Three-Dimensional Characterization of Explosive Performance	2/21/2018	2/20/2021		0	102,850	102,850
L. Livermore National Lab	18-ERD-053	The Development of High-Order Interface Tracking Schemes for the Simulation of Multiphase Flows	12/20/2017	4/14/2020		0	76,640	76,640
L. Livermore National Lab	18-ERD-054	Advancing Measurements and Understanding of the Rate and Structure of Atmospheric Warming	12/20/2017	9/30/2020		0	184,440	184,440
L. Livermore National Lab	18-ERD-057	Influence of Process Parameters and Alloy Composition on Crack Mitigation in Selective Laser Melting	1/29/2018	9/30/2020		0	203,350	203,350
L. Livermore National Lab	18-ERD-060	Metal Ejecta: Transport, Interaction, and Recollection	4/18/2018	4/17/2021		0	293,420	293,420
L. Livermore National Lab	18-ERD-062	Bioprinting Breast Cancer In Situ to Study Cell Communication in Disease Progression	6/6/2018	6/5/2021		0	161,700	161,700
L. Livermore National Lab	18-ERD-063	Imaging Dynamics of Defects Far from Equilibrium	7/27/2018	6/30/2021		0	197,950	197,950
L. Livermore National Lab	18-LW-039	Rapid Detection of Candidates for Vaccines Against Biothreat Agents	10/1/2017	2/14/2020		0	100,940	100,940
L. Livermore National Lab	18-LW-061	Probing Photon Fusion for New Physics at the Large Hadron Collider Using Proton Tagging	10/1/2017	9/30/2020		0	272,580	272,580
L. Livermore National Lab	18-SI-001	Developing and Characterizing New Tools for Actinide Processing Science	10/1/2017	9/30/2020		0	2,965,620	2,965,620
L. Livermore National Lab	18-SI-002	Learning-Based Predictive Models: A New Approach to Integrating Large-Scale Simulations and Experiments	10/1/2017	9/30/2020		0	2,994,350	2,994,350

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L. Livermore National Lab	18-SI-003	A New Science-based Paradigm Enabling Microstructure-Tailored Additive Manufacturing of Metals	10/1/2017	12/30/2020	This project was extended because of	0	2,311,570	2,311,570
L. Livermore National Lab	18-SI-004	Unlocking the Mysteries of High-Explosive Science	10/1/2017	12/30/2020		0	1,590,390	1,590,390
L. Livermore National Lab	19-DR-001	Climbing over Energy Barriers: A New Paradigm for Accelerating Kinetics	4/3/2019	3/30/2022		0	388,140	388,140
L. Livermore National Lab	19-DR-002	Advanced Manufacturing of Net-Shape Leading Edge Geometries for Hypersonic Flight	4/3/2019	3/30/2022		0	559,890	559,890
L. Livermore National Lab	19-DR-003	Hypothesis Testing via Artificial Intelligence: Generating Physically Interpretable Models of Scientific Data with Machine Learning	4/3/2019	3/30/2022		0	906,710	906,710
L. Livermore National Lab	19-DR-005	Nuclear Dynamics on a Quantum Chip	4/3/2019	3/30/2022		0	469,090	469,090
L. Livermore National Lab	19-DR-009	Thulium-Doped Yttrium Lithium Fluoride High-Energy Laser Demonstrator	4/3/2019	3/30/2022		0	717,770	717,770
L. Livermore National Lab	19-DR-011	Plasma Amplifiers to Enable Dramatic Increases in Laser Power and Energy to Access New Physical Processes	4/3/2019	3/30/2022		0	440,500	440,500
L. Livermore National Lab	19-DR-013	Beating Monte Carlo: The Polynomial Method in Lattice Problems	4/3/2019	3/30/2022		0	183,060	183,060
L. Livermore National Lab	19-DR-014	Vaccination on the Fly: The Use of Mosquitoes to Vaccinate Bat Populations That Harbor Human Pathogens	4/3/2019	3/30/2022		0	648,760	648,760
L. Livermore National Lab	19-DR-015	Compact High Efficiency Electrically Tunable Amplifier	4/3/2019	3/30/2022		0	627,000	627,000
L. Livermore National Lab	19-ERD-001	Germanium Photodiode Arrays for Hard X-Ray Imaging	10/1/2018	9/30/2021		0	738,310	738,310
L. Livermore National Lab	19-ERD-002	Micro-Resonators for Compact Optical Sensors	10/1/2018	9/30/2021		0	592,990	592,990
L. Livermore National Lab	19-ERD-003	Development of Novel Ligand-Based Systems to Study the Chemical Properties of the Transactinides	10/1/2018	9/30/2021		0	426,910	426,910
L. Livermore National Lab	19-ERD-004	Heterogeneous Computing Elements: A Quantitative Evaluation	10/1/2018	9/30/2021		0	563,540	563,540
L. Livermore National Lab	19-ERD-005	Transforming Living Materials into Chemical Reactors	10/1/2018	9/30/2021		0	530,660	530,660
L. Livermore National Lab	19-ERD-006	Gestalt Optics: Three-Dimensional Transparent Ceramics	10/1/2018	9/30/2021		0	338,770	338,770
L. Livermore National Lab	19-ERD-007	Next Generation Machine Learning	10/1/2018	9/30/2021		0	532,570	532,570
L. Livermore National Lab	19-ERD-008	Acoustic and Electromagnetic Characterization for Accelerated Development of Additive Manufacturing	10/1/2018	9/30/2021		0	467,890	467,890
L. Livermore National Lab	19-ERD-009	A Deep Bayesian Active Learning Framework for Temporal Multimodal Data	10/1/2018	9/30/2021		0	905,130	905,130
L. Livermore National Lab	19-ERD-010	Deeply Rooted: Evaluating Plant Rooting Depth as a Means for Enhanced Soil Carbon Sequestration	10/1/2018	9/30/2021		0	781,520	781,520
L. Livermore National Lab	19-ERD-011	Beta Decay at the Limits of Nuclear Stability: Integrating Ab Initio Calculations and Kinematically Complete Measurements	10/1/2018	9/30/2021		0	409,160	409,160
L. Livermore National Lab	19-ERD-012	Advanced Photopolymer Materials Engineering for Multiscale Additive Fabrication	10/1/2018	9/30/2021		0	997,280	997,280
L. Livermore National Lab	19-ERD-013	Expanding Control of Quantum Processor Units	10/1/2018	9/30/2021		0	1,562,390	1,562,390
L. Livermore National Lab	19-ERD-015	Scalable Computational Tools for Predicting Fluid-Structure Interactions in Laser Directed-Energy Applications	10/1/2018	9/30/2021		0	720,870	720,870
L. Livermore National Lab	19-ERD-016	Deployable, Automated Chemistry-on-a-Chip Platform for Nuclear Forensics	10/1/2018	9/30/2021		0	394,770	394,770
L. Livermore National Lab	19-ERD-017	Nuclear Reaction Theory for Astrophysics and Laboratory Applications	10/1/2018	9/30/2021		0	374,280	374,280
L. Livermore National Lab	19-ERD-018	Materials with Embedded Microstructural Logic	10/1/2018	9/30/2021		0	487,240	487,240
L. Livermore National Lab	19-ERD-019	Scalable Multilevel Training of Large Neural Networks	10/1/2018	9/30/2021		0	340,900	340,900
L. Livermore National Lab	19-ERD-020	Glass Inks for Three-Dimensional Printed Fiber Preforms and Telescope Optics	10/1/2018	9/30/2021		0	667,630	667,630

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L. Livermore National Lab	19-ERD-021	Industrial Control Systems Network Mapping and Data Analytics for Cybersecurity	10/1/2018	9/30/2021		0	495,610	495,610
L. Livermore National Lab	19-ERD-022	High-Resolution Three-Dimensional Imaging via X-Ray Reflectometry and Phase-Contrast Computed Tomography	10/1/2018	9/30/2021		0	464,610	464,610
L. Livermore National Lab	19-ERD-025	Advanced Physics Models for Particle-Particle Interactions	10/1/2018	9/30/2021		0	516,480	516,480
L. Livermore National Lab	19-ERD-026	Exascale-Ready Modeling to Predict Recrystallization in High-Temperature Materials	10/1/2018	9/30/2021		0	560,730	560,730
L. Livermore National Lab	19-ERD-027	The Physics of Confined Laser Ablation and Its Applications	10/1/2018	9/30/2021		0	553,710	553,710
L. Livermore National Lab	19-ERD-029	Tunable Optoelectronic Materials for Next-Generation Infrared Detectors	10/1/2018	9/30/2021		0	409,260	409,260
L. Livermore National Lab	19-ERD-030	High-Performance Parallel Simulations for Whole-Cell Modeling	10/1/2018	9/30/2021		0	399,430	399,430
L. Livermore National Lab	19-ERD-031	Unraveling the Physics and Chemistry of Water-Rich Mixtures at Extreme Pressures and Temperatures	2/1/2019	1/31/2022		0	567,550	567,550
L. Livermore National Lab	19-ERD-032	Interseasonal Prediction of Western United States Snowpack with Deep Learning	10/1/2018	9/30/2021		0	413,550	413,550
L. Livermore National Lab	19-ERD-035	Automatic Design of Transport Systems Through Topology Optimization on Adaptively Refined Computational Grids	10/1/2018	9/30/2021		0	622,910	622,910
L. Livermore National Lab	19-ERD-036	Investigating the Site of the Weak Rapid Neutron Capture Process	10/3/2018	9/30/2021		0	196,940	196,940
L. Livermore National Lab	19-ERD-038	Laser-Plasma Interactions in Magnetized Environments	11/9/2018	11/8/2021		0	150,530	150,530
L. Livermore National Lab	19-ERD-039	Photonic Transceivers for Secure Radio Frequency Communications and Radar	4/3/2019	4/30/2020		0	140,290	140,290
L. Livermore National Lab	19-FS-005	Hot Plasma Etching of Gallium Nitride	1/2/2019	12/31/2019		0	38,590	38,590
L. Livermore National Lab	19-FS-028	Establishing Hands-On Astrophysics at Lawrence Livermore National Laboratory	2/11/2019	12/31/2019		0	10,130	10,130
L. Livermore National Lab	19-FS-030	Enabling Optimized Charging of Electric Vehicles in Mobility Services	2/11/2019	12/31/2019		0	20,310	20,310
L. Livermore National Lab	19-FS-032	Assessment of Laser-Damage Performance of Meta-Surface Material to Enable High-Speed Laser Beam Control	2/11/2019	1/31/2020		0	22,550	22,550
L. Livermore National Lab	19-FS-034	Short-Pulse Interrogation for Detection of Special Nuclear Materials	2/11/2019	12/31/2019		0	20,040	20,040
L. Livermore National Lab	19-FS-035	Elucidating Algal-Bacterial Community Interactions by Tracking Volatile Biomarkers	2/11/2019	2/10/2020		0	49,990	49,990
L. Livermore National Lab	19-FS-037	Laser Powder Bed Fusion Additive Manufacturing In-Process Monitoring and Optimization Using Thermionic Emission Detection	4/8/2019	3/30/2020		0	40,210	40,210
L. Livermore National Lab	19-FS-044	Development of Multilayer Laue Lenses for 25 Kilo-Electronvolt X-Ray Imaging	2/11/2019	2/10/2020		0	33,800	33,800
L. Livermore National Lab	19-FS-045	Examining an On-the-Fly Movable Boundary Capability for Simulations of Unsteady High-Speed Aerothermodynamic Flows	2/11/2019	11/30/2019		0	20,040	20,040
L. Livermore National Lab	19-FS-056	New Experiment-Theory Capability for Atomic-Level Imaging of Interfaces in Solid-State Batteries	2/11/2019	2/10/2020		0	48,170	48,170
L. Livermore National Lab	19-FS-061	New Design for Low-Mode Asymmetry Mitigation in Inertial Confinement Fusion Implosions	12/17/2018	12/16/2019		0	18,680	18,680
L. Livermore National Lab	19-FS-064	Metamaterials for Mechanically Directing Cell Phenotype	4/8/2019	12/31/2019		0	20,490	20,490
L. Livermore National Lab	19-FS-067	Development of Beryllium Carbide Capsules for Inertial Confinement Fusion Implosions	4/8/2019	6/30/2020	This project was extended because of	0	24,620	24,620

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L. Livermore National Lab	19-FS-070	Using Microscale Models to Enhance Predictions of Damage to Soft Tissues	4/15/2019	12/31/2019		0	23,880	23,880
L. Livermore National Lab	19-FS-072	Quantum Leap for Fusion Energy Sciences	4/15/2019	4/14/2020		0	30,880	30,880
L. Livermore National Lab	19-FS-073	Time-Resolved Two-Dimensional Streak Camera	4/8/2019	4/30/2020	This project was extended because of	0	49,520	49,520
L. Livermore National Lab	19-LW-004	Connecting Nuclear Structure to Stellar Astrophysics: Neutron Skin in Tin Isotopes	10/1/2018	9/30/2020		0	284,590	284,590
L. Livermore National Lab	19-LW-006	Three-Dimensional Bioprinted Aneurysm for Intervention Modeling Validation	10/1/2018	9/30/2020		0	268,400	268,400
L. Livermore National Lab	19-LW-027	Using Moderately Volatile Elements to Understand the Origin of the Earth-Moon System	10/1/2018	9/30/2020		0	207,590	207,590
L. Livermore National Lab	19-LW-028	Metal-Phthalocyanine Superlattices: Exploring Quantum Devices as a New Paradigm for Sensing Applications and Information Storage	10/1/2018	9/30/2020		0	176,860	176,860
L. Livermore National Lab	19-LW-029	Antibacterial Minerals: A Geochemical Approach to Combating Antibiotic Resistance	10/1/2018	9/30/2020		0	262,150	262,150
L. Livermore National Lab	19-LW-033	Proliferation of Interstellar Plutonium into the Solar System	10/1/2018	9/30/2020		0	212,740	212,740
L. Livermore National Lab	19-LW-036	Dating Alluvial Landforms to Understand the Role of Climate in California's Water Supply	10/1/2018	9/30/2020		0	265,310	265,310
L. Livermore National Lab	19-LW-039	Discovering the Nature of Neutrinos: How Nuclear Theory Will Advance This Grand Endeavor	10/1/2018	9/30/2020		0	231,730	231,730
L. Livermore National Lab	19-LW-040	Unconventional Superconductivity in a Focused-Ion-Beam-Decorated Topological Insulator	10/1/2018	9/30/2020		0	263,170	263,170
L. Livermore National Lab	19-LW-044	Using Isotope Probing of Microbe-Microbe Interactions to Determine the Fate of Carbon and Impacts on Climate Change	10/1/2018	9/30/2020		0	271,490	271,490
L. Livermore National Lab	19-LW-046	Constraining the Origin of Earth's Water with Isotope Tracers in Astromaterials	10/1/2018	9/30/2020		0	247,050	247,050
L. Livermore National Lab	19-LW-048	Molecular Mechanisms of Bacterial Pathogenesis: Waging the Arms Race with Superbugs	10/1/2018	9/30/2020		0	287,310	287,310
L. Livermore National Lab	19-LW-056	Development of Additive-Manufacturing Inks with Embedded Electronics for Programmable Matter	10/1/2018	9/30/2020		0	265,090	265,090
L. Livermore National Lab	19-SI-001	Accelerating Feedstock Optimization Using Computer Vision, Machine Learning, and Data Analytic Techniques	10/1/2018	9/30/2021		0	2,389,230	2,389,230
L. Livermore National Lab	19-SI-002	Establishing a Laser-Driven Megaelectronvolt X-Ray and Neutron Radiographic Capability	10/1/2018	9/30/2021		0	2,425,140	2,425,140
L. Livermore National Lab	19-SI-003	Engineered and Instrumented Three-Dimensional Tumor-Immune Model System	10/1/2018	9/30/2021		0	2,517,740	2,517,740
L. Livermore National Lab	19-SI-004	Modeling and Analysis for Data-Starved or Ambiguous Environments	10/1/2018	9/30/2021		0	1,972,210	1,972,210
L. Livermore National Lab	19-SI-005	Manufacturing Molecules for the Carbon Economy	10/1/2018	9/30/2021		0	3,702,910	3,702,910
L. Livermore National Lab	20-ERD-001	Addressing Unresolved Questions About the Solar System with New Lunar Samples from the Apollo Missions	10/1/2019	9/30/2022		0	635,820	635,820
L. Livermore National Lab	20-ERD-002	Optimal High-Order Solvers	10/1/2019	9/30/2022		0	479,040	479,040
L. Livermore National Lab	20-ERD-003	Freeform Optics	10/1/2019	9/30/2022		0	1,015,270	1,015,270
L. Livermore National Lab	20-ERD-004	Delivering Ribonucleic Acid Vaccines Using Nanoparticles	10/1/2019	9/30/2022		0	684,640	684,640
L. Livermore National Lab	20-ERD-005	Narcissus-Enabled Compact Thermal Hyperspectral Imager	10/1/2019	9/30/2022		0	233,200	233,200
L. Livermore National Lab	20-ERD-006	High-Energy Advanced Thermal Performance	10/1/2019	9/30/2022		0	1,161,540	1,161,540
L. Livermore National Lab	20-ERD-007	Observing Atmospheric Gravity Waves from Space	10/1/2019	9/30/2022		0	554,270	554,270
L. Livermore National Lab	20-ERD-008	Improved Seismic Monitoring for National and Energy Security with Earth Models from Full Waveform Inversion	10/1/2019	9/30/2022		0	602,210	602,210

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L. Livermore National Lab	20-ERD-009	Profiling Neurological Consequences and Susceptible Populations of Chronic Opioid Use	10/1/2019	9/30/2022		0	658,950	658,950
L. Livermore National Lab	20-ERD-010	Characterizing Materials for Quantum Computing	10/1/2019	9/30/2022		0	400,120	400,120
L. Livermore National Lab	20-ERD-012	Glass Preforms for Next-Generation Fiber Lasers	10/1/2019	9/30/2022		0	545,440	545,440
L. Livermore National Lab	20-ERD-013	Bioprinting of Engineered Biofilms for Microbial Electrosynthesis	10/1/2019	9/30/2022		0	539,700	539,700
L. Livermore National Lab	20-ERD-014	Safe and Trustworthy Machine Learning	10/1/2019	9/30/2022		0	509,460	509,460
L. Livermore National Lab	20-ERD-018	Laser Processing of Solid-State Lithium Batteries	10/1/2019	9/30/2022		0	659,310	659,310
L. Livermore National Lab	20-ERD-019	High Energy Density Supercapacitors	10/1/2019	9/30/2022		0	637,620	637,620
L. Livermore National Lab	20-ERD-020	Modeling Complex Behavior of Lattices to Enable Multiscale Design	10/1/2019	9/30/2022		0	648,910	648,910
L. Livermore National Lab	20-ERD-021	Developing Compositional Control During Additive Manufacturing of Surrogate Debris Reference Materials and Microanalytical Standards	10/1/2019	9/30/2022		0	450,040	450,040
L. Livermore National Lab	20-ERD-022	Revealing the Physics of the Hot and Energetic Universe via Single-Photon-Counting Advanced X-Ray Microcalorimeter Systems	10/1/2019	9/30/2022		0	390,200	390,200
L. Livermore National Lab	20-ERD-023	Super-Strong, Micrometer-Thin Carbon Nanotube Yarns	10/1/2019	9/30/2022		0	538,660	538,660
L. Livermore National Lab	20-ERD-024	Defects Suppression in Process-Optimized High Power and Energy Multilayer Dielectric Coated Optics	10/1/2019	9/30/2022		0	560,890	560,890
L. Livermore National Lab	20-ERD-025	Asteroid Science in the Era of the Large Synoptic Survey Telescope	10/1/2019	9/30/2022		0	502,870	502,870
L. Livermore National Lab	20-ERD-026	Using Nano-Structured Targets and Ultra-Intense Lasers for Nuclear Science and Source Development	10/1/2019	9/30/2022		0	475,710	475,710
L. Livermore National Lab	20-ERD-027	Materials Response Under Hypersonic Flow Conditions Probed by Multimodal Diagnostics in a Benchtop Wind Tunnel	10/1/2019	9/30/2020		0	1,080,930	1,080,930
L. Livermore National Lab	20-ERD-028	Scalable Quantum Optimal Control	10/1/2019	9/30/2022		0	582,090	582,090
L. Livermore National Lab	20-ERD-029	Ultrathick Boron Carbide Coatings	10/1/2019	9/30/2022		0	738,190	738,190
L. Livermore National Lab	20-ERD-030	Deciphering Fingerprints of Stellar Nucleosynthesis Through Nuclear Reaction Rate Measurements and Isotopic Analyses of Stardust	1/8/2020	1/6/2023		0	302,160	302,160
L. Livermore National Lab	20-ERD-031	Fission Experiments in Laser-Generated Plasmas	10/1/2019	9/30/2022		0	275,120	275,120
L. Livermore National Lab	20-ERD-032	Active Learning for Rapid Design of Vaccines and Antibodies	10/1/2019	9/30/2022		0	1,349,630	1,349,630
L. Livermore National Lab	20-ERD-033	Robust Control of Scientific Simulations with Deep Reinforcement Learning	10/1/2019	9/30/2020		0	920,280	920,280
L. Livermore National Lab	20-ERD-034	Understanding Urban and Wildland Fire Dynamics	10/1/2019	9/30/2022		0	329,110	329,110
L. Livermore National Lab	20-ERD-035	Plasma Transport at the Nexus of Measurement and Modeling	3/2/2020	3/1/2023		0	193,040	193,040
L. Livermore National Lab	20-ERD-036	Accelerated Multi-Modal Manufacturing Optimization	10/1/2019	9/30/2022		0	1,052,620	1,052,620
L. Livermore National Lab	20-ERD-038	Scalable and Accurate Simulation of Magnetized Plasmas	10/1/2019	9/30/2022		0	587,160	587,160
L. Livermore National Lab	20-ERD-039	The Nuclear Science of Asteroid 16 Psyche	10/1/2019	9/30/2022		0	239,860	239,860
L. Livermore National Lab	20-ERD-041	Probing the Structure of a Perfect Liquid Using Jets and Machine Learning	10/1/2019	9/30/2022		0	395,610	395,610
L. Livermore National Lab	20-ERD-042	Mid- and High-Z Doping of High Purity, Density Tunable Amorphous Carbon Films on Complex Geometries	10/1/2019	9/30/2022		0	252,930	252,930
L. Livermore National Lab	20-ERD-043	Approximate High-Performance Computing: A Fast and Energy-Efficient Computing Paradigm in the Post-Moore Era	10/1/2019	9/30/2022		0	596,030	596,030
L. Livermore National Lab	20-ERD-044	Uncertainty Quantification and Experimental Design Using a Quantitative Forward Model for Kinematic X-Ray Diffraction	10/1/2019	9/30/2022		0	327,370	327,370

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L. Livermore National Lab	20-ERD-045	Nuclear Analytics: Enabling New Multimodal Approaches to Nuclear Threat Detection	10/1/2019	9/30/2022		0	411,240	411,240
L. Livermore National Lab	20-ERD-046	Next-Generation Beam Quality for Deployed Laser Systems	10/1/2019	9/30/2022		0	825,720	825,720
L. Livermore National Lab	20-ERD-048	Tailored Particle Sources Driven by Precision-Shaped Short-Pulse Laser Pulses	10/1/2019	9/30/2022		0	543,130	543,130
L. Livermore National Lab	20-ERD-049	Probabilistic Models for Dynamic Hypergraphs with Content	10/1/2019	9/30/2022		0	532,740	532,740
L. Livermore National Lab	20-ERD-050	Development of a Multidimensional, Holographic Velocity Interferometer System	10/1/2019	9/30/2022		0	549,020	549,020
L. Livermore National Lab	20-ERD-052	Sirius Mini: A Prototype Disruptive Accelerator Architecture for Next-Generation Inertial Confinement Fusion Systems	10/1/2019	9/30/2022		0	493,510	493,510
L. Livermore National Lab	20-ERD-053	Exploration of In-Memory Analytics	10/1/2019	9/30/2022		0	458,530	458,530
L. Livermore National Lab	20-ERD-054	Flexible and High-Density Nerve Interface for Peripheral Neuromodulation	10/17/2019	9/30/2022		0	417,980	417,980
L. Livermore National Lab	20-ERD-055	Understanding Carbon Accumulation Below Ground and the Role of Nutrients Under Rising Carbon Dioxide Levels	10/25/2019	9/30/2022		0	192,950	192,950
L. Livermore National Lab	20-ERD-056	Developing an Understanding and Control of Electrochemical Deposition Processes for Functional Coatings on Complex Three-Dimensionally Printed Substrates	12/20/2019	12/19/2022		0	927,320	927,320
L. Livermore National Lab	20-ERD-057	Ultrafast Plasma Optics for High-Power Coherent Light Sources	10/25/2019	9/30/2022		0	201,030	201,030
L. Livermore National Lab	20-ERD-058	Behavior and Utility of Flow or Turbulence in Compressing Plasma	10/25/2019	9/30/2022		0	173,030	173,030
L. Livermore National Lab	20-ERD-059	Magnetostrictive Materials for Enhanced Sensors and Electronic Components	4/1/2020	3/31/2023		0	240,280	240,280
L. Livermore National Lab	20-ERD-060	Improving Durability in the Next Generation of Photovoltaic Materials Through Discovery and Mitigation of Interface-Based Degradation Mechanisms	4/1/2020	3/31/2023		0	281,730	281,730
L. Livermore National Lab	20-ERD-061	Microbiome Controls on Harmful Algal Toxin Production in Lake Erie	4/1/2020	3/31/2023		0	243,930	243,930
L. Livermore National Lab	20-ERD-062	Rapid Computational Identification of Therapeutic Targets for Pathogens	3/18/2020	3/17/2023		0	453,590	453,590
L. Livermore National Lab	20-ERD-064	Building a Computational and Experimental Rapid Response Pipeline to Counter the Coronavirus Disease 2019 Outbreak and Emerging Biothreats	3/18/2020	3/17/2021		0	974,160	974,160
L. Livermore National Lab	20-ERD-065	Identifying Potential Antiviral Small Molecules Against the Coronavirus Disease 2019	3/24/2020	3/23/2021		0	1,229,020	1,229,020
L. Livermore National Lab	20-FS-001	Bioprinting Transgenic Plant Cells for Chemical and Biological Countermeasure Production	10/1/2019	9/30/2020		0	134,230	134,230
L. Livermore National Lab	20-FS-002	Addressing Qubits with a Software-Defined Radio Field Programmable Gate Array	10/9/2019	9/30/2020		0	64,930	64,930
L. Livermore National Lab	20-FS-004	Sculpting Non-Machinable Porous Materials	11/22/2019	9/30/2020		0	148,020	148,020
L. Livermore National Lab	20-FS-005	Floating Point Reproducibility for Accelerator-Based Systems	10/1/2019	9/30/2020		0	141,190	141,190
L. Livermore National Lab	20-FS-006	Imaging of Defects in Polymer Structures Using Water as a Detection Marker: The Search for Appropriate Illumination Sources and Signal Processing Methods	10/1/2019	9/30/2020		0	144,990	144,990
L. Livermore National Lab	20-FS-007	Nonlinear Manifold-Based Reduced Order Models	10/1/2019	9/30/2020		0	139,170	139,170
L. Livermore National Lab	20-FS-008	Vanishing Neural Probes - Chronic Implants on Resorbable Substrates	10/1/2019	9/30/2020		0	102,460	102,460
L. Livermore National Lab	20-FS-009	Synthetic Biology for Nuclear Activity Detection	10/1/2019	9/30/2020		0	107,070	107,070

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L. Livermore National Lab	20-FS-010	Machine Learning-Driven Dynamic Four-Dimensional X-Ray Computed Tomography Reconstruction	10/1/2019	11/30/2020	This project was extended because of	0	122,350	122,350
L. Livermore National Lab	20-FS-011	Beam Homogenization of Laser Drivers for High-Energy, Large-Aperture Optical Parametric Chirped-Pulse Amplification	1/17/2020	9/30/2020		0	120,590	120,590
L. Livermore National Lab	20-FS-012	Development of Operando Nuclear Magnetic Resonance Capabilities for Solid-State Battery Research	10/17/2019	9/30/2020		0	147,040	147,040
L. Livermore National Lab	20-FS-013	Generating Extreme Magnetic Fields by Engineering Short-Pulse Laser Targets	10/1/2019	9/30/2020		0	115,640	115,640
L. Livermore National Lab	20-FS-015	Optimizing Performance Through Parallelism-Aware Compilation	10/1/2019	9/30/2020		0	142,240	142,240
L. Livermore National Lab	20-FS-017	High-Fidelity, Scalable Quantum Qubit Control Signal Generation	10/1/2019	9/30/2020		0	148,370	148,370
L. Livermore National Lab	20-FS-018	Nonlinear Spatial Discretization Using Sparse Grids	10/1/2019	9/30/2020		0	160,150	160,150
L. Livermore National Lab	20-FS-019	Trustworthy Firmware Updates for Energy Control Systems	10/1/2019	9/30/2020		0	148,920	148,920
L. Livermore National Lab	20-FS-020	Learning Neural Activation Manifolds for Secure Artificial Intelligence	10/1/2019	9/30/2020		0	147,210	147,210
L. Livermore National Lab	20-FS-021	Functional Metal Coatings on Three-Dimensional Substrates	10/1/2019	9/30/2020		0	89,010	89,010
L. Livermore National Lab	20-FS-022	High-Flux Electrochemical Synthesis of Ammonia in Ionic Liquid	3/4/2020	3/3/2021		0	115,840	115,840
L. Livermore National Lab	20-FS-024	Utilizing Radioactive Isotopes Harvested at the Facility for Rare Isotope Beams for Neutron-Reaction Measurements	1/31/2020	1/30/2021		0	104,710	104,710
L. Livermore National Lab	20-FS-026	Extending the Reach of Extreme Ultraviolet Instruments: A New Method for Measuring the Refractive Index of Materials	1/17/2020	3/18/2021	This project was extended because of	0	107,480	107,480
L. Livermore National Lab	20-FS-028	Development of Secondary Toroidal Diamond Anvil Cell Gaskets for Highly Compressible Low-Z Sample Containment at Pressures Above 4 Megabars	1/22/2020	9/30/2020		0	130,630	130,630
L. Livermore National Lab	20-FS-029	Boot Camp Bugs: Microbiomes of US Infantry Trainees	1/17/2020	12/30/2020		0	127,070	127,070
L. Livermore National Lab	20-FS-032	Parallel Two-Photon Lithography Using a Metalens Array	1/17/2020	4/30/2021	This project was extended because of	0	38,020	38,020
L. Livermore National Lab	20-FS-034	Measuring the Interpolation Quality of Trained Neural Networks	1/17/2020	9/30/2020		0	147,290	147,290
L. Livermore National Lab	20-FS-035	Shape Changing of Responsive Elastomer Structures	1/31/2020	12/31/2020		0	114,710	114,710
L. Livermore National Lab	20-FS-037	Scalable Approximate Graph Clustering	1/17/2020	9/30/2020		0	151,070	151,070
L. Livermore National Lab	20-FS-039	Active Control of Turbulent Flows through Deep Learning	1/31/2020	9/30/2020		0	134,320	134,320
L. Livermore National Lab	20-FS-040	Persistent Concurrent Data Structures	1/17/2020	9/30/2020		0	142,000	142,000
L. Livermore National Lab	20-FS-041	Accelerated and Disaggregated Cognitive Simulation	1/17/2020	9/30/2020		0	111,930	111,930
L. Livermore National Lab	20-FS-042	Dual Wavelength Negative Imaging Digital Light Processing Stereo Lithographic Apparatus	1/17/2020	12/30/2020		0	106,950	106,950
L. Livermore National Lab	20-FS-044	Quantum Cascade Lasers with Submicrosecond Tuning Speed for the Detection of High Explosives and Chemical Warfare Agents	2/3/2020	12/30/2020		0	121,590	121,590
L. Livermore National Lab	20-FS-049	Per- and Polyfluoroalkyl Substances Removal from Water by Plasmonic-Photocatalysis	1/17/2020	12/31/2020		0	30,090	30,090
L. Livermore National Lab	20-LW-001	Two Nucleon Interactions and Their Effect on the Visible Universe and the Dark Universe	10/1/2019	9/30/2021		0	233,860	233,860
L. Livermore National Lab	20-LW-002	Using High-Dimensional Omics Data to Identify Therapeutic Strategies for Promoting Tissue Repair and Regeneration	10/1/2019	9/30/2021		0	279,070	279,070
L. Livermore National Lab	20-LW-006	A Search for Sterile Neutrino Dark Matter	10/1/2019	9/30/2021		0	268,130	268,130

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L. Livermore National Lab	20-LW-008	Constraining the Habitability of Mars When Water Flowed on Its Surface	10/1/2019	9/30/2021		0	242,170	242,170
L. Livermore National Lab	20-LW-015	Hydrogen Embrittlement-Resistant High-Entropy Alloys with High Strength and Ductility	10/1/2019	9/30/2021		0	258,850	258,850
L. Livermore National Lab	20-LW-017	Elusive Actinium: A First Glimpse into the Coordination Chemistry of Element 89	10/1/2019	9/30/2021		0	288,170	288,170
L. Livermore National Lab	20-LW-018	Toward Wearable Artificial Intelligence: Flexible Nanocrystal Memristors That Mimic Multilevel Synaptic Functions	10/1/2019	9/30/2021		0	213,460	213,460
L. Livermore National Lab	20-LW-020	Engineering Yeast Biosensors for Pathogen Detection	10/1/2019	9/30/2021		0	285,180	285,180
L. Livermore National Lab	20-LW-021	Capturing a New State of Matter: Relativistic Electron-Positron Plasma	10/1/2019	9/30/2021		0	255,220	255,220
L. Livermore National Lab	20-LW-024	Redefining the Geologic Timescale of the Solar System by Accurately Determining the Half-Life of Samarium-146 with Magnetic Microcalorimeters	10/1/2019	9/30/2021		0	261,430	261,430
L. Livermore National Lab	20-LW-027	Pattern Formation in Concurrent Multiscale Simulation: A Breakthrough in Understanding Metal Behavior	10/1/2019	9/30/2021		0	238,040	238,040
L. Livermore National Lab	20-LW-038	Incorporation of Carbon Electrodes on Flexible Microelectrode Arrays	10/1/2019	9/30/2021		0	198,290	198,290
L. Livermore National Lab	20-LW-039	Development of Magnetic Nanostructures and Their Composites for Efficacious and Lightweight Millimeter Wave Absorbers	10/1/2019	9/30/2021		0	264,660	264,660
L. Livermore National Lab	20-LW-040	Direct Visualization of Structural Maintenance of Chromosomes by Protein-Mediated Loop Extrusion Using High-Speed Atomic Force Microscopy	10/1/2019	9/30/2021		0	265,250	265,250
L. Livermore National Lab	20-LW-045	Understanding Angular Momentum in Nuclear Fission	10/1/2019	9/30/2021		0	269,990	269,990
L. Livermore National Lab	20-LW-046	Nuclear Reaction Theory in the Precision Era: Probing New Physics in the Early Universe	10/1/2019	9/30/2021		0	211,610	211,610
L. Livermore National Lab	20-LW-056	Ultrahigh-Resolution X-Ray Spectroscopy Using Cyclotron Radiation Emission	10/1/2019	9/30/2021		0	231,180	231,180
L. Livermore National Lab	20-SI-001	Advanced Quantitative Metrology and Characterization for Manufacturing	10/1/2019	9/30/2022		0	2,403,590	2,403,590
L. Livermore National Lab	20-SI-002	Magnetically Assisted Ignition	10/1/2019	9/30/2022		0	2,716,690	2,716,690
L. Livermore National Lab	20-SI-003	The Next Frontiers in Rare-Event Detection for Science and Security	10/1/2019	9/30/2022		0	1,990,970	1,990,970
L. Livermore National Lab	20-SI-004	Predicting and Controlling Corrosion	10/1/2019	9/30/2022		0	2,492,510	2,492,510
L. Livermore National Lab	20-SI-005	Decentralized Autonomous Networks for Cooperative Estimation	10/1/2019	9/30/2022		0	1,797,560	1,797,560
L. Livermore National Lab	20-SI-006	Identifying the Influence of Environmental Effects on Post-Detonation Chemistry and Debris Formation	10/1/2019	9/30/2022		0	2,688,030	2,688,030
Los Alamos National Lab	LANL-20170179ER	High Energy Lightning: Understanding Relations Between Energetic Particles and Lightning Discharges in Thunderclouds	10/1/2016	3/31/2020	This project deploys lightning sensors	0	86,030	86,030
Los Alamos National Lab	LANL-20170660PRD1	Neuromorphic Memcomputing via Interacting Nanomagnets	2/21/2017	2/20/2020		0	57,305	57,305
Los Alamos National Lab	LANL-20170661PRD1	Dark Matter and the Validity of Effective Field Theories	9/5/2017	9/4/2020		0	170,341	170,341
Los Alamos National Lab	LANL-20170662PRD1	First Principles Approach to Factorization Violation	1/9/2017	1/8/2020		0	45,458	45,458
Los Alamos National Lab	LANL-20170666PRD1	Jets in Strongly Interacting Plasmas	8/21/2017	8/20/2020		0	144,791	144,791
Los Alamos National Lab	LANL-20170667PRD1	A Gruneisen Approach to Quantum Criticality	4/17/2017	4/16/2020		0	27,399	27,399
Los Alamos National Lab	LANL-20170668PRD1	Impacts of Climate and Land Use on Global River Dynamics	4/3/2017	4/2/2020		0	20,060	20,060
Los Alamos National Lab	LANL-20170670PRD1	Toward Controlled Synthesis of Actinide Oxide Nanocrystals: A Theoretical Perspective	2/27/2017	2/7/2020		0	16,970	16,970

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Los Alamos National Lab	LANL-20170671PRD2	Developing a Unique Technology to Control Emerging Threats of Antibiotic-resistant Pathogens	4/3/2017	11/2/2019		0	10,190	10,190
Los Alamos National Lab	LANL-20170672PRD2	Valley Dynamics and Coherence in Atomically-Thin Semiconductors	9/25/2017	9/24/2020		0	50,509	50,509
Los Alamos National Lab	LANL-20170673PRD2	Forecasting Failure	7/3/2017	7/2/2020		0	29,497	29,497
Los Alamos National Lab	LANL-20170677PRD2	Prediction of Magnetic Properties of Actinide Complexes Using Ab Initio Methods	7/31/2017	7/30/2020		0	4,937	4,937
Los Alamos National Lab	LANL-20170688PRD3	Engineering Deoxyribonucleic Acid Protected Silver Nanoclusters via Doping and Alloying	9/5/2017	7/24/2020		0	103,404	103,404
Los Alamos National Lab	LANL-20170690PRD4	Epigenetic Control of Synchronized Proliferation in Harmful Algal Blooms	9/11/2017	10/15/2019		0	5,126	5,126
Los Alamos National Lab	LANL-20170691PRD4	Accelerated Discovery of New Nanocomposites for Energy Applications	10/30/2017	10/29/2019		0	7,938	7,938
Los Alamos National Lab	LANL-20170692PRD4	Molecular Basis of Ras-related Cancers	12/3/2018	12/2/2020		0	92,622	92,622
Los Alamos National Lab	LANL-20170693PRD4	Mega Electron Volt Gamma-Ray Astronomy: Exploring the Universe in the Nuclear Transition Region	10/23/2017	10/22/2020		0	60,323	60,323
Los Alamos National Lab	LANL-20170695PRD4	Excited State Dynamics for Photochemistry and Light-Matter Interactions	1/2/2018	1/1/2020		0	15,742	15,742
Los Alamos National Lab	LANL-20180005DR	Establishing a Radiotherapeutic Capability to Counter Biothreats	10/1/2017	9/30/2020		0	1,516,116	1,516,116
Los Alamos National Lab	LANL-20180007DR	Understanding Actinide-Water Interactions in High Pressure-Temperature Environments	10/1/2017	2/28/2021	Extended to mitigate Coronavirus (CC	0	1,506,796	1,506,796
Los Alamos National Lab	LANL-20180017ER	Effects of Cosmic Ray Neutrons on Modern High Performance Computing Components	10/1/2017	1/29/2021	Extended to mitigate Coronavirus (CC	0	335,248	335,248
Los Alamos National Lab	LANL-20180025DR	Uncovering the Role of 5f-electron Magnetism in the Electronic Structure and Equation of State of Plutonium	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	1,449,772	1,449,772
Los Alamos National Lab	LANL-20180026DR	Rational Design of Halide Perovskites for Next Generation Gamma-ray Detection	10/1/2017	1/31/2021	Extended to mitigate Coronavirus (CC	0	1,407,022	1,407,022
Los Alamos National Lab	LANL-20180033DR	Adaptation Science for Complex Natural-Engineered Systems	12/18/2017	12/17/2020		0	1,479,644	1,479,644
Los Alamos National Lab	LANL-20180038DR	Deepening Los Alamos National Laboratory's Neutrino Legacy	10/1/2017	9/30/2020		0	1,523,146	1,523,146
Los Alamos National Lab	LANL-20180040DR	Quantifying Effects of Magnetic Fields for Inertial Confinement Fusion/High-Energy-Density Plasmas with Instabilities and Turbulence	10/1/2017	9/30/2020		0	1,458,287	1,458,287
Los Alamos National Lab	LANL-20180045DR	Atomtronics: A New Approach to Sensing, Signal Processing, and Signal Analysis	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	1,503,315	1,503,315
Los Alamos National Lab	LANL-20180051DR	A Low Fuel Convergence Path to Inertial Confinement Fusion on the National Ignition Facility	10/1/2017	1/29/2021	Extended to mitigate Coronavirus (CC	0	1,555,216	1,555,216
Los Alamos National Lab	LANL-20180058ER	Imaging Neural Dynamics with Ultra-Low Field Magnetic Resonance Imaging	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	412,748	412,748
Los Alamos National Lab	LANL-20180062DR	Dominating the Electromagnetic Spectrum with Spatio-Temporal Modulated Metasurfaces	10/1/2017	1/31/2021	Extended to mitigate Coronavirus (CC	0	1,309,294	1,309,294
Los Alamos National Lab	LANL-20180066DR	The Fundamental Physical Interpretation and Exploitation of Stable Isotope Fractionation	10/1/2017	9/30/2020		0	1,496,409	1,496,409
Los Alamos National Lab	LANL-20180074ER	Nonlinear Dynamics of Cross-Beam Energy Transfer for Multi-Speckled Laser Beams	10/1/2017	9/30/2020		0	321,229	321,229
Los Alamos National Lab	LANL-20180078ER	Production of Shaped Electron Bunches with Diamond Field Emitter Array Cathodes	10/1/2017	4/30/2021	Extended to mitigate Coronavirus (CC	0	418,324	418,324
Los Alamos National Lab	LANL-20180097ER	Enabling Fast Disaggregation of Large Parameter Spaces	10/1/2017	9/30/2020		0	316,353	316,353
Los Alamos National Lab	LANL-20180098ER	Quantitative Understanding of Electronic Correlations in F-Electron Quantum Matter	10/1/2017	9/30/2020		0	276,218	276,218
Los Alamos National Lab	LANL-20180100DR	Boom or Bust? Predicting Explosive Safety under Impacts	10/1/2017	9/30/2020		0	1,516,697	1,516,697

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Los Alamos National Lab	LANL-20180114ER	Making the Unmakeable: Nanostabilized Magnetic Alloys	10/1/2017	9/30/2020		0	295,352	295,352
Los Alamos National Lab	LANL-20180125ER	Atomic Structure of Actinides	10/1/2017	9/30/2020		0	295,677	295,677
Los Alamos National Lab	LANL-20180128ER	Utilizing Crystalline Sponges to Perform Single Crystal X-ray Determination on Trace Amounts of Actinium Compounds	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	294,519	294,519
Los Alamos National Lab	LANL-20180129ER	Search for Axion-mediated Interactions with a Spin-exchange Relaxation-free Magnetometer	10/1/2017	9/30/2020		0	329,753	329,753
Los Alamos National Lab	LANL-20180137ER	Electronic Structure of Putative Topological Kondo Insulators	10/1/2017	2/26/2021	Extended to mitigate Coronavirus (CC	0	320,247	320,247
Los Alamos National Lab	LANL-20180139ER	Powering the Resolution Revolution with Multi-Resolution Algorithms: Merging Image Analysis, Molecular Simulation and Model Building	10/1/2017	9/30/2020		0	285,886	285,886
Los Alamos National Lab	LANL-20180151ER	Visualizing and Understanding Complex Fluid Transport in Three-Dimensional Microstructure	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	296,829	296,829
Los Alamos National Lab	LANL-20180154ER	Synthesizing Fokker-Planck and Navier-Stokes Methods for Strongly Coupled Hydrodynamics and Material Fields in Turbulent Mixing	10/1/2017	9/30/2020		0	280,389	280,389
Los Alamos National Lab	LANL-20180158ER	Geophysical Signatures of Changing Water Resources	10/1/2017	9/30/2020		0	300,229	300,229
Los Alamos National Lab	LANL-20180189ER	Visualizing Nanoscale Spatio-Temporal Dynamics in Single Quantum Systems	10/1/2017	1/30/2021	Extended to mitigate Coronavirus (CC	0	313,277	313,277
Los Alamos National Lab	LANL-20180197ER	Missing Physics behind X-ray Emission from High-Energy-Density Plasmas	10/1/2017	9/30/2020		0	308,167	308,167
Los Alamos National Lab	LANL-20180210ER	Properties of Medium Nuclei from First Principles	10/1/2017	9/30/2020		0	308,707	308,707
Los Alamos National Lab	LANL-20180213ER	Hamiltonian on Demand for Computational Materials Using Machine Learning	10/1/2017	9/30/2020		0	287,578	287,578
Los Alamos National Lab	LANL-20180220ER	Improved Biologically Friendly Polymer Drag Reducers From Novel Architectures	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	329,293	329,293
Los Alamos National Lab	LANL-20180228ER	Pinning Down the Neutrino-proton Process Importance in Heavy Element Production via Reaction Studies on Radioactive Nickel-56	10/1/2017	5/28/2021	Extended to mitigate Coronavirus (CC	0	363,947	363,947
Los Alamos National Lab	LANL-20180238ER	Proton Radiography for Advanced Cancer Therapy	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	281,117	281,117
Los Alamos National Lab	LANL-20180242ER	Ultrafast X-ray Imaging Using Slow, Visible Cameras	10/1/2017	1/31/2021	Extended to mitigate Coronavirus (CC	0	319,433	319,433
Los Alamos National Lab	LANL-20180244ER	OrganiCam: A High-Sensitivity Radiation-Hardened Imaging Organic Detector For Space and Programmatic Applications	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	388,067	388,067
Los Alamos National Lab	LANL-20180250ER	Next Generation Discrete Dislocation Dynamics Modelling for Materials Science Applications	10/1/2017	9/30/2020		0	287,569	287,569
Los Alamos National Lab	LANL-20180257ER	Ultra-Diffuse Galaxies, Tidal Streams and Dwarf Galaxies: The Low-Surface Brightness Frontier	10/1/2017	2/28/2021	Extended to mitigate Coronavirus (CC	0	417,085	417,085
Los Alamos National Lab	LANL-20180267ER	Preprocessing Algorithms for Boosting Quantum Annealing Scalability	10/1/2017	9/30/2020		0	278,652	278,652
Los Alamos National Lab	LANL-20180283ER	Dopant Profiling in Semiconductors by Scanning Frequency Comb Microscopy	10/1/2017	9/30/2020		0	304,603	304,603
Los Alamos National Lab	LANL-20180295ER	In Situ Characterization of Uranium Hydriding Corrosion	10/1/2017	12/31/2020	Extended to mitigate Coronavirus (CC	0	232,320	232,320
Los Alamos National Lab	LANL-20180360ER	Two-dimensional Nanostructure-Engineered Durable Supercapacitors	10/1/2017	9/30/2020		0	320,894	320,894
Los Alamos National Lab	LANL-20180369ER	Switchable Spin Crossover Explosives: Nitrogen-rich Iron (Fe II) Complexes for On-Demand Initiation Sensitivity	10/1/2017	9/30/2020		0	306,891	306,891
Los Alamos National Lab	LANL-20180372ER	Breaking the Efficiency Limits in Quantum Dot Emitters Using Dual-Band Metamaterials	10/1/2017	9/30/2020		0	295,644	295,644
Los Alamos National Lab	LANL-20180393ER	Removing and Swapping Photoreceptors in Algae to Improve Biomass Yield	10/1/2017	9/30/2020		0	276,834	276,834

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Los Alamos National Lab	LANL-20180428ER	Novel Algorithms for Large-Scale Ab-Initio Materials Simulations: Extending the Reach of Quantum Mechanics	10/1/2017	9/30/2020		0	322,263	322,263
Los Alamos National Lab	LANL-20180441ER	Methods and Algorithms to Account for Field Fluctuations Obtained by Homogenization in Solid Mechanics	10/1/2017	9/30/2020		0	291,935	291,935
Los Alamos National Lab	LANL-20180449ER	Next Generation Models for Radial Diffusion of Energetic Electrons in the Earth's Radiation Belts	10/1/2017	9/30/2020		0	303,210	303,210
Los Alamos National Lab	LANL-20180468ER	Optimization Aware Uncertainty Quantification in Non-Linear Networked Systems	10/1/2017	9/30/2020		0	288,977	288,977
Los Alamos National Lab	LANL-20180474DR	Properties, Theory, and Measurements for Understanding the Function of Heavy Elements	10/1/2017	9/30/2020		0	1,218,475	1,218,475
Los Alamos National Lab	LANL-20180475DR	Emerging Challenges in Space and Earth Science	10/11/2017	12/31/2020	Extended to mitigate Coronavirus (CO	0	1,931,297	1,931,297
Los Alamos National Lab	LANL-20180529ECR	Geospatial Change Surveillance with Heterogeneous Data	1/16/2018	1/14/2020		0	73,294	73,294
Los Alamos National Lab	LANL-20180535ECR	Integrated Study of X-ray Free-electron Lasers Performance with High Brightness Bunched Electron Beams	1/16/2018	1/14/2020		0	51,104	51,104
Los Alamos National Lab	LANL-20180549ECR	Advanced Understanding of Ocean Heat Storage by Coupling Large Eddy Simulation to a Global Ocean Model	1/16/2018	1/14/2020		0	51,579	51,579
Los Alamos National Lab	LANL-20180552ECR	Excited State Dynamics for Spin Systems	1/16/2018	1/14/2020		0	48,822	48,822
Los Alamos National Lab	LANL-20180573ECR	Critical Analysis of Neutrinoless Double Beta Decay with Effective Field Theories	1/16/2018	1/14/2020		0	51,450	51,450
Los Alamos National Lab	LANL-20180579ECR	Advancing Discrete Fracture Matrix Models using Topologically Driven System Reduction	7/2/2018	7/1/2020		0	153,143	153,143
Los Alamos National Lab	LANL-20180589ECR	Establishing a Scientific Understanding for the Generation of Radiofrequency Signals from High Explosives	1/16/2018	1/14/2020		0	47,705	47,705
Los Alamos National Lab	LANL-20180597ECR	Tracking Ultrafast Morphology Changes in Solid Explosives During a Detonation using Visible Laser Speckle	1/16/2018	1/14/2020		0	52,363	52,363
Los Alamos National Lab	LANL-20180607ECR	Robust Anomaly Detection in Complex Networks: Data Fusion and New-Link Prediction	1/16/2018	1/14/2020		0	50,880	50,880
Los Alamos National Lab	LANL-20180612ECR	Modeling Heterogeneous Surveillance Data for Adaptive Real-time Response to Epidemics	1/16/2018	1/14/2020		0	51,749	51,749
Los Alamos National Lab	LANL-20180613ECR	Hybrid Density Functional Theory	4/16/2018	4/14/2020		0	106,932	106,932
Los Alamos National Lab	LANL-20180618ECR	Probing Quantum Fluctuations via Thermal Expansion Measurements under Pressure	1/16/2018	1/14/2020		0	40,532	40,532
Los Alamos National Lab	LANL-20180621ECR	Joint Critical Thresholds and Extremes for Vulnerability Assessment of Regional Stability	2/26/2018	2/25/2020		0	84,387	84,387
Los Alamos National Lab	LANL-20180622ECR	New Physics at the Giga Electron Volt Scale, with Implications for the Strong Charge-conjugation x Parity Problem	1/16/2018	1/14/2020		0	51,324	51,324
Los Alamos National Lab	LANL-20180628ECR	Machine Learning of Quantum Computing Algorithms	10/1/2018	9/30/2020		0	205,893	205,893
Los Alamos National Lab	LANL-20180633ECR	Overdriven Shock and Initiation Effects on Detonator-Scale Energetic Materials	1/16/2018	1/14/2020		0	58,445	58,445
Los Alamos National Lab	LANL-20180700PRD1	Machine Learning the Physics of an Active Gold Mine	1/8/2018	1/7/2021		0	134,312	134,312
Los Alamos National Lab	LANL-20180702PRD1	Optimal Control of Quantum Machines	1/8/2018	1/7/2021		0	37,869	37,869
Los Alamos National Lab	LANL-20180703PRD1	Unusual Oxidation States and Covalency-Tuning in Transuranic Molecules	4/16/2018	7/30/2021	Extended to mitigate Coronavirus (CO	0	170,722	170,722
Los Alamos National Lab	LANL-20180705PRD1	New First Row Transition Metal Based Catalysts for Sustainable Energy Production	4/2/2018	4/1/2020		0	78,972	78,972
Los Alamos National Lab	LANL-20180709PRD1	Conformal Field Theories with the Bootstrap	10/1/2018	9/30/2020		0	106,168	106,168
Los Alamos National Lab	LANL-20180710PRD1	Design of State-of-the-art Flow Cells for Energy Applications	2/12/2018	2/11/2021		0	169,882	169,882

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Los Alamos National Lab	LANL-20180711PRD2	Atomic Layer Deposition of Templated Electrode Structures for Electrochemical Devices	3/12/2018	3/11/2020		0	7,359	7,359
Los Alamos National Lab	LANL-20180713PRD2	Exploration of New Topological States of Matter in Strongly Correlated Materials and in Ultra-high Magnetic Fields	3/26/2018	2/19/2021		0	69,651	69,651
Los Alamos National Lab	LANL-20180714PRD2	Shock-accelerated Variable-density Mixing in a Subsonic Cross Flow	3/26/2018	3/25/2020		0	45,390	45,390
Los Alamos National Lab	LANL-20180715PRD2	How Biological Communities Can Unlock Hidden Signatures of Environmental Change	4/16/2018	4/15/2020		0	106,524	106,524
Los Alamos National Lab	LANL-20180716PRD2	Extreme Radiation Magnetohydrodynamics Around Black Holes	5/21/2018	5/20/2020		0	58,224	58,224
Los Alamos National Lab	LANL-20180719ER	Rapid Response: Novel Computing	4/23/2018	9/30/2020		0	772,612	772,612
Los Alamos National Lab	LANL-20180744PRD3	Development of an Innovative Mechanical Testing System and Techniques for Characterizing Irradiated Advanced Cladding Concepts and Novel Materials	6/11/2018	10/23/2020		0	67,118	67,118
Los Alamos National Lab	LANL-20180745PRD3	Machine Learning of Membrane Transport of Signals and Drugs	9/4/2018	9/3/2020		0	59,389	59,389
Los Alamos National Lab	LANL-20180746PRD3	Principles for Optimal Establishment and Resilience of Microbial Communities	6/11/2018	6/10/2020		0	63,207	63,207
Los Alamos National Lab	LANL-20180747PRD3	Ferromagnetism and Spin Fluctuations in the Atomically-Thin Limit	8/13/2018	8/12/2020		0	98,334	98,334
Los Alamos National Lab	LANL-20180748PRD3	Unraveling Nature's Mysteries at the World's Highest Energy Colliders	6/25/2018	6/24/2020		0	78,692	78,692
Los Alamos National Lab	LANL-20180751PRD3	Improving Public Health by Linking Virus Genetic Evolution and Epidemic Spread	2/19/2019	2/18/2022		0	167,754	167,754
Los Alamos National Lab	LANL-20180753PRD3	An Atomtronic Rotation Sensor	7/30/2018	7/29/2020		0	83,055	83,055
Los Alamos National Lab	LANL-20180754PRD4	Doped Carbon Dots for Enhanced Fuel Cell Catalysis	12/3/2018	12/2/2020		0	41,617	41,617
Los Alamos National Lab	LANL-20180756PRD4	Conservative Slow-Manifold Integrators	1/7/2019	1/6/2022		0	180,205	180,205
Los Alamos National Lab	LANL-20180758PRD4	Overcoming the Curse of Dimensionality to Predict Chemical Reactivity	1/28/2019	1/27/2022		0	167,254	167,254
Los Alamos National Lab	LANL-20180759PRD4	Investigating Actinide-Based Molecular Magnetism with Electron Paramagnetic Resonance	1/28/2019	1/27/2021		0	129,041	129,041
Los Alamos National Lab	LANL-20190001DR	BioManufacturing with Intelligent Adaptive Control	10/1/2018	9/30/2021		0	1,601,856	1,601,856
Los Alamos National Lab	LANL-20190002DR	Hyperspectral X-ray Imaging: Nanochemical Analysis of Actinide and Explosive Materials	4/15/2019	3/31/2022		0	1,715,101	1,715,101
Los Alamos National Lab	LANL-20190005DR	Enabling Predictive Scale-Bridging Simulations through Active Learning	10/1/2018	9/30/2021		0	1,577,355	1,577,355
Los Alamos National Lab	LANL-20190020DR	Tensor Networks: Robust Unsupervised Machine Learning for Big-Data Analytics	10/1/2018	9/30/2021		0	1,535,983	1,535,983
Los Alamos National Lab	LANL-20190021DR	Nucleosynthesis Probes of Cosmic Explosions	10/1/2018	9/30/2021		0	1,525,616	1,525,616
Los Alamos National Lab	LANL-20190026DR	Driven Quantum Matter: A Route Towards Novel Phases	10/1/2018	9/30/2021		0	1,601,134	1,601,134
Los Alamos National Lab	LANL-20190033ER	Using Quarkonia to Probe Matter from the Early Universe	10/1/2018	9/30/2021		0	312,054	312,054
Los Alamos National Lab	LANL-20190034ER	Massively-Parallel Acceleration of the Dynamics of Complex Systems: a Data-Driven Approach	10/1/2018	9/30/2021		0	282,013	282,013
Los Alamos National Lab	LANL-20190041DR	The Neutron Electric Dipole Moment as a Gateway to New Physics	10/1/2018	9/30/2021		0	1,812,107	1,812,107
Los Alamos National Lab	LANL-20190043DR	Brighter, Faster, Tougher: Adaptive Co-design of Resilient Radiation Detector Materials	10/1/2018	9/30/2021		0	1,550,544	1,550,544
Los Alamos National Lab	LANL-20190048ER	Ultra-Cold Neutron Experiment for Proton Branching Ratio in Neutron Beta Decay	10/1/2018	9/30/2021		0	295,827	295,827
Los Alamos National Lab	LANL-20190057DR	Salts in Hot Water—Developing a Scientific Basis for Supercritical Desalination, Strategic Metal Recovery, and Industrial Water Treatment	10/1/2018	9/30/2021		0	1,556,750	1,556,750
Los Alamos National Lab	LANL-20190059DR	Machine Learning for Turbulence	10/1/2018	9/30/2021		0	1,543,441	1,543,441
Los Alamos National Lab	LANL-20190065DR	Taming Defects in Quantum Computers	10/1/2018	9/30/2021		0	1,510,521	1,510,521

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Los Alamos National Lab	LANL-20190066ER	Wideband Sub-Millimeter Source for Deployed Applications	10/1/2018	9/30/2021		0	313,207	313,207
Los Alamos National Lab	LANL-20190076ER	Tuning Functionality via Dimensionality in 4f-Based Nanowires	10/1/2018	9/30/2021		0	298,939	298,939
Los Alamos National Lab	LANL-20190084ER	Shockwave Metamaterials: Harnessing Structural Hierarchy for Tailorable Dynamic Response	10/1/2018	9/30/2021		0	307,248	307,248
Los Alamos National Lab	LANL-20190091ER	Chemistry of a New Oxidation State for the Early Transuranic Elements	10/1/2018	9/30/2021		0	323,492	323,492
Los Alamos National Lab	LANL-20190098DR	Convincing Search for Sterile Neutrinos at Lujan	10/1/2018	9/30/2021		0	1,757,706	1,757,706
Los Alamos National Lab	LANL-20190107ER	Early Detection of Explosive Volcanic Eruptions Using Very High Frequency Radiation from Vent Discharges	10/1/2018	9/30/2021		0	302,640	302,640
Los Alamos National Lab	LANL-20190113ER	Ultralight Bosonic Dark Matter Search with an Optically Pumped Magnetometer	10/1/2018	9/30/2021		0	340,405	340,405
Los Alamos National Lab	LANL-20190119ER	Air-Buoyant Vessel	10/1/2018	9/30/2020		0	324,461	324,461
Los Alamos National Lab	LANL-20190124ER	Hot Electron Beam Generation and Transport for Fast Ignition	10/1/2018	9/30/2021		0	327,985	327,985
Los Alamos National Lab	LANL-20190131ER	A New Computation Framework for the Nonlinear Beam Dynamics with Radiation Self-fields	10/1/2018	9/30/2021		0	321,235	321,235
Los Alamos National Lab	LANL-20190143ER	Objective Flow Topology	10/1/2018	9/30/2021		0	301,921	301,921
Los Alamos National Lab	LANL-20190153ER	Understanding and Predicting Hydrocarbon Behaviors in Nanopores of Tight Reservoirs	10/1/2018	9/30/2021		0	321,380	321,380
Los Alamos National Lab	LANL-20190167DR	A Clustered Regularly Interspaced Short Palindromic Repeats Future	10/1/2018	9/30/2021		0	1,614,509	1,614,509
Los Alamos National Lab	LANL-20190195ER	Towards Memristor Supremacy with Novel Machine Learning Algorithms	10/1/2018	9/30/2021		0	294,526	294,526
Los Alamos National Lab	LANL-20190206ER	The Influence of Multiple Scattering on the Opacities of Warm and Hot Dense Matter	10/1/2018	9/30/2021		0	299,703	299,703
Los Alamos National Lab	LANL-20190224ER	Strongly Interacting Polariton Condensates at Room Temperature	10/1/2018	9/30/2021		0	302,325	302,325
Los Alamos National Lab	LANL-20190227ER	Stable, Conservative, High-Order Numerical Methods for Direct Numerical Simulations in Complex Geometries	10/1/2018	9/30/2021		0	299,278	299,278
Los Alamos National Lab	LANL-20190228ER	Accelerated Aging of Crystalline Plutonium Compounds	10/1/2018	9/30/2021		0	305,064	305,064
Los Alamos National Lab	LANL-20190232ER	Quantum Dot Sunlight Collectors for Building-Integrated Photovoltaics	10/1/2018	9/30/2020		0	296,734	296,734
Los Alamos National Lab	LANL-20190236ER	Wavelength-Selectable, Electrically Driven Single-Photon Sources Operating at Room Temperature	10/1/2018	9/30/2021		0	303,738	303,738
Los Alamos National Lab	LANL-20190238ER	Boron and Ribose in Clay: a Precursor for Life on Earth and Mars?	10/1/2018	9/30/2021		0	323,106	323,106
Los Alamos National Lab	LANL-20190262ER	Using Solar Energetic Protons to Monitor the Outer Magnetosphere	10/1/2018	9/30/2021		0	297,169	297,169
Los Alamos National Lab	LANL-20190268ER	Reduced-profile Current-sheet Array Antenna with Simpler Drive and Better Antenna Efficiency	10/1/2018	9/30/2020		0	329,289	329,289
Los Alamos National Lab	LANL-20190294ER	A Non-Invasive Current Profile Diagnostic for Electron Bunches	10/1/2018	9/30/2021		0	337,991	337,991
Los Alamos National Lab	LANL-20190310ER	Innovating Wildfire Representation in Earth System Models	10/1/2018	9/30/2021		0	302,952	302,952
Los Alamos National Lab	LANL-20190334ER	Quantum Metrology with an Atom Superconducting Quantum Interference Device	10/1/2018	9/30/2021		0	349,749	349,749
Los Alamos National Lab	LANL-20190342ER	Thermally Expandable Microspheres for Plastic-bonded Explosive Properties Control	10/1/2018	9/30/2021		0	320,865	320,865
Los Alamos National Lab	LANL-20190351ER	Statistical Learning in Cyberphysical Systems	10/1/2018	9/30/2021		0	325,886	325,886
Los Alamos National Lab	LANL-20190360ER	Emergent Bogoliubov Fermi Surface in Unconventional Superconductors	10/1/2018	9/30/2021		0	348,124	348,124
Los Alamos National Lab	LANL-20190364ER	Illuminating Plutonium: Spectroelectrochemistry in High Temperature Molten Salts	10/1/2018	9/30/2021		0	309,567	309,567

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Los Alamos National Lab	LANL-20190372ER	Biogenic Uranium Isotope Fractionation for Biotechnology	10/1/2018	9/30/2021		0	328,180	328,180
Los Alamos National Lab	LANL-20190373ER	Novel, Fast Enhancements to Bragg Ptychography	10/1/2018	9/30/2021		0	280,229	280,229
Los Alamos National Lab	LANL-20190383ER	Origin of High-Energy Astrophysical Neutrinos: Multi-messenger Signals from Flares of Extragalactic Jets	10/1/2018	9/30/2021		0	353,140	353,140
Los Alamos National Lab	LANL-20190392ER	Viral Mosaic Biosensor	10/1/2018	9/30/2021		0	332,672	332,672
Los Alamos National Lab	LANL-20190420ER	Organic Molecular Electrocatalysts for Hydrogen Evolution Reaction	10/1/2018	9/30/2021		0	337,728	337,728
Los Alamos National Lab	LANL-20190430ER	Magnetization Fluctuation Spectroscopy as a Dynamic Probe of Emergent Magnetic Phases	10/1/2018	9/30/2021		0	332,819	332,819
Los Alamos National Lab	LANL-20190440ER	Mixed Conductors for Enhanced Fuel Cell Performance	10/1/2018	9/30/2021		0	299,819	299,819
Los Alamos National Lab	LANL-20190441ER	Understanding Glycan Dynamics and Heterogeneity for Effective Human Immunodeficiency Virus Vaccine Development	10/1/2018	9/30/2021		0	302,947	302,947
Los Alamos National Lab	LANL-20190463ER	Three-dimensional Printed Hierarchically Porous Heat Pipe Wicks	10/1/2018	9/30/2020		0	199,644	199,644
Los Alamos National Lab	LANL-20190494ER	Emulating Quantum Magnetism with Rydberg Atoms	10/29/2018	9/30/2021		0	372,196	372,196
Los Alamos National Lab	LANL-20190495DR	Theory and Computation on Quantum Systems	10/1/2018	9/30/2021		0	495,982	495,982
Los Alamos National Lab	LANL-20190496DR	The Dynamics of Systems Far From Equilibrium	10/1/2018	9/30/2021		0	505,212	505,212
Los Alamos National Lab	LANL-20190497ER	Theoretical and Experimental Materials Science	11/29/2018	9/30/2020		0	516,133	516,133
Los Alamos National Lab	LANL-20190498ER	Discovering the Three-dimensional Structure and Dynamics of the Sun-Interstellar Medium System on a Global Scale	10/16/2018	9/30/2021		0	240,686	240,686
Los Alamos National Lab	LANL-20190499ER	Evaluating and Increasing the Reliability of Supercomputer and Autonomous Vehicles (Rosen Scholar)	3/18/2019	12/31/2019		0	96,809	96,809
Los Alamos National Lab	LANL-20190505ER	Non-Destructive Analysis and Surveillance of Containers used for Nuclear Material Storage	11/26/2018	9/30/2020		0	176,101	176,101
Los Alamos National Lab	LANL-20190516ECR	Electronic Transport in Atomically Thin Materials at Far from Mechanical Equilibrium Conditions	1/15/2019	1/14/2021		0	176,123	176,123
Los Alamos National Lab	LANL-20190517ECR	High Efficiency Active Environmental Sampling of Chemical Traces	2/5/2019	2/4/2021		0	193,937	193,937
Los Alamos National Lab	LANL-20190519ECR	Numerical Methods for Radiation Hydrodynamics Simulations on Current and Future Advanced Parallel Architectures	1/15/2019	1/14/2021		0	174,703	174,703
Los Alamos National Lab	LANL-20190524ER	High Efficiency Automated Leaching of Gloveboxes	11/26/2018	9/30/2020		0	561,363	561,363
Los Alamos National Lab	LANL-20190528ER	Modeling an Artificial Radiation Belt of Ionized Fission Fragments After a High-altitude Nuclear Explosion	11/26/2018	9/30/2020		0	540,163	540,163
Los Alamos National Lab	LANL-20190529ECR	A Multidimensional Multiscale Vlasov-Fokker-Planck Algorithm for Modeling High Energy Density and Inertial Confinement Fusion Applications	6/3/2019	6/2/2021		0	185,633	185,633
Los Alamos National Lab	LANL-20190530ER	A Simplified Design and Advanced Manufacture for Expedited Explosive Hydrodynamic Testing and Equation of State Development using Extreme Scaling	11/29/2018	9/30/2020		0	424,108	424,108
Los Alamos National Lab	LANL-20190536ECR	Adaptive Process Control for Beyond-State-of-the-Art Alkali Antimonide Photocathodes	1/15/2019	1/14/2021		0	221,501	221,501
Los Alamos National Lab	LANL-20190541ER	Modeling Late-Time Electromagnetic Pulse and Its Disturbed Atmospheric Environment	11/26/2018	9/30/2020		0	541,821	541,821
Los Alamos National Lab	LANL-20190546ECR	Improving Predictions of Complex Systems with Predictive Discrepancy Models and Data Fusion	1/15/2019	1/14/2021		0	203,771	203,771
Los Alamos National Lab	LANL-20190552ECR	Illuminating the Subsurface with Nonlinear Behavior	1/15/2019	1/14/2021		0	196,306	196,306
Los Alamos National Lab	LANL-20190565ECR	Granddaughter Radiochronometry for Nuclear Forensics	1/15/2019	1/14/2021		0	116,512	116,512
Los Alamos National Lab	LANL-20190566ECR	Optimizing Scientific Codes in the Presence of Extreme Heterogeneity Using Machine Learning	1/15/2019	1/14/2021		0	205,286	205,286

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Los Alamos National Lab	LANL-20190568ECR	Understanding the Wave Mechanics of Micro-architected Waveguides to Design Acoustic Quick Response Codes	4/15/2019	4/14/2021		0	203,859	203,859
Los Alamos National Lab	LANL-20190570ECR	Molecular Multi-Actinide Cores to Model Surface Reactivity	10/1/2019	9/30/2021		0	225,094	225,094
Los Alamos National Lab	LANL-20190571ECR	Adaptive Framework for Enabling Real-time Feedback During Three-dimensional Mesoscale Microstructure Evolution Measurements	1/15/2019	1/14/2021		0	202,241	202,241
Los Alamos National Lab	LANL-20190574ECR	Nonlinear Photonics of Topological Phase Transitions in the Graphene Family	6/3/2019	6/2/2021		0	200,722	200,722
Los Alamos National Lab	LANL-20190580ECR	In-Process, Full Part Defect Detection for Additive Manufacturing	1/15/2019	1/14/2021		0	240,403	240,403
Los Alamos National Lab	LANL-20190581ECR	Accurate Model for Predicting Mosquito Population Response to Weather and Water Management	1/15/2019	1/14/2021		0	157,186	157,186
Los Alamos National Lab	LANL-20190588ECR	A Dual n-gamma Detector Array to Correct Neutron Transport Simulations	1/15/2019	1/14/2021		0	233,965	233,965
Los Alamos National Lab	LANL-20190590ECR	Discrete Optimization Algorithms for Provably Optimal Quantum Circuit Design	10/1/2019	9/30/2021		0	204,391	204,391
Los Alamos National Lab	LANL-20190595ECR	Persistent Signatures of Neutron Fluence in Structural Materials	1/28/2019	1/3/2020		0	50,599	50,599
Los Alamos National Lab	LANL-20190613PRD1	Perovskite-type Metal-Organic Framework with Strong Magnetoelectric Coupling	1/14/2019	1/13/2022		0	152,932	152,932
Los Alamos National Lab	LANL-20190614PRD1	Biophysical Interactions of Amphiphiles with Biomimetically Patterned Membranes	1/21/2019	1/20/2022		0	169,876	169,876
Los Alamos National Lab	LANL-20190616PRD1	Enabling Artificial Selection Programs through Characterizing the Lifecycle of Green Algae	1/14/2019	1/13/2021		0	109,183	109,183
Los Alamos National Lab	LANL-20190617PRD1	Matter and Nuclei at Neutron-Rich Extremes	2/18/2019	2/17/2021		0	110,322	110,322
Los Alamos National Lab	LANL-20190618PRD1	Disease Outcome Analysis for Improved Disease Interventions	2/11/2019	2/10/2021		0	65,240	65,240
Los Alamos National Lab	LANL-20190620PRD1	A Novel "Three-in-One" Metal Organic Framework-Based Platform For Nanoparticle Encapsulation and Organization	4/15/2019	4/14/2021		0	108,214	108,214
Los Alamos National Lab	LANL-20190622PRD2	State-of-the-Art Predictions for the Matter-Antimatter Asymmetry	8/26/2019	8/25/2021		0	132,138	132,138
Los Alamos National Lab	LANL-20190623PRD2	Novel X-ray Imaging to Unlock the Potential of Antiferromagnetic Materials	3/11/2019	3/10/2021		0	113,494	113,494
Los Alamos National Lab	LANL-20190624PRD2	Phase Diagrams and Conductivity in the Interiors of White Dwarf Stars	7/22/2019	7/21/2021		0	138,196	138,196
Los Alamos National Lab	LANL-20190625PRD2	Smart Mobile Sensor Platform Development for Radiological Mapping of Large-Scale Areas	9/9/2019	9/8/2021		0	123,123	123,123
Los Alamos National Lab	LANL-20190626PRD2	Searching for Dark Matter with Fixed Target Experiments	9/9/2019	9/8/2021		0	132,644	132,644
Los Alamos National Lab	LANL-20190639PRD2	In Situ Mesoscale Response under Combined Pressure-Shear Dynamic Loading	6/10/2019	6/10/2021		0	149,968	149,968
Los Alamos National Lab	LANL-20190640PRD3	Synthesis of Platinum-Rare Earth Intermetallic Fuel Cell Catalysts	6/10/2019	6/9/2021		0	169,465	169,465
Los Alamos National Lab	LANL-20190641PRD3	Development and Implementation of a Portable Microfluidic J-Coupled Spectrometer for Rapid Detection and Identification of Emerging Chemical Threats	6/10/2019	6/9/2021		0	147,554	147,554
Los Alamos National Lab	LANL-20190642PRD3	Ex Machina Hamiltonians for Next-Generation Molecular Simulations	6/10/2019	6/9/2021		0	112,907	112,907
Los Alamos National Lab	LANL-20190643DR	Novel in situ Probes of Mesoscale Materials Dynamics	6/10/2019	9/30/2020		0	925,641	925,641
Los Alamos National Lab	LANL-20190644PRD3	Multiscale Quantitative Description of Drug Resistance Mechanisms in Bacterial Systems	9/3/2019	9/2/2021		0	129,468	129,468

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Los Alamos National Lab	LANL-20190647PRD3	Designing New Ferroelectric Materials with Spin Crossover Transitions	7/8/2019	7/7/2021		0	132,342	132,342
Los Alamos National Lab	LANL-20190648PRD3	The Optoelectronic Device Applications of Two-Dimensional Interlayer Moiré Excitons	9/9/2019	9/8/2021		0	136,558	136,558
Los Alamos National Lab	LANL-20190649DR	Demonstration of Advanced Experimental and Theoretical Characterization of Hydrogen Dynamics and Associated Behavior in Advanced Reactors	6/10/2019	9/30/2020		0	775,010	775,010
Los Alamos National Lab	LANL-20190650DR	A Multidisciplinary Approach to Advance Our Understanding of Actinide-Bearing Molten Salt Systems	6/17/2019	9/30/2020		0	772,477	772,477
Los Alamos National Lab	LANL-20190651DR	Advanced Signatures, Processing, and Exploitation for Counter-proliferation	7/8/2019	9/30/2020		0	511,581	511,581
Los Alamos National Lab	LANL-20190653PRD4	Toward a Universal Description for Aqueous Solutions	9/9/2019	9/8/2021		0	133,287	133,287
Los Alamos National Lab	LANL-20190654PRD4	Exploration of Colossal Thermoelectric Power in Topological Magnets	9/9/2019	9/8/2021		0	121,069	121,069
Los Alamos National Lab	LANL-20190655PRD4	Unraveling Lipoprotein Signatures for Tick-Borne Pathogens	9/16/2019	9/15/2021		0	142,308	142,308
Los Alamos National Lab	LANL-20190656PRD4	Defect tolerant scintillators: Linking structure and performance via machine learning	9/16/2019	9/15/2021		0	133,115	133,115
Los Alamos National Lab	LANL-20190658PRD4	Development of Next Generation Microstructure-aware Burn Models for High Explosives	3/2/2020	3/1/2022		0	94,156	94,156
Los Alamos National Lab	LANL-20190659PRD4	Emergent Quantum Phenomena with Tensor Networks	11/18/2019	11/17/2021		0	118,204	118,204
Los Alamos National Lab	LANL-20200001CR	Machine Learning Enhanced Modeling	10/1/2019	9/30/2022		0	498,469	498,469
Los Alamos National Lab	LANL-20200002CR	Mechanistic Studies of Human Disease	10/1/2019	9/30/2022		0	609,590	609,590
Los Alamos National Lab	LANL-20200003ER	Atomic Magnetometry for the neutron Electric Dipole Moment Experiment (Rosen Scholar)	10/22/2019	9/30/2021		0	229,386	229,386
Los Alamos National Lab	LANL-20200015ER	Quantum Computing with Strontium Nuclear Qubits	10/1/2019	9/30/2022		0	336,873	336,873
Los Alamos National Lab	LANL-20200016DR	Optimizing Machine Learning for Science and Security	1/21/2020	9/30/2020		0	467,872	467,872
Los Alamos National Lab	LANL-20200022DR	A New Era of Nuclear Physics at the Electron-Ion Collider	10/1/2019	9/30/2022		0	1,594,110	1,594,110
Los Alamos National Lab	LANL-20200033DR	An Integrated Scaling Approach for Human, Mosquito, and Environment Toward Process-based Disease Prediction	10/1/2019	9/30/2020		0	502,528	502,528
Los Alamos National Lab	LANL-20200035DR	Hot Smoke-Dust Signatures to Predict Nuclear Fallout and Winter	10/1/2019	9/30/2022		0	1,559,987	1,559,987
Los Alamos National Lab	LANL-20200040DR	Dose and Signature Assessment for Triage Applications	10/1/2019	9/30/2020		0	498,232	498,232
Los Alamos National Lab	LANL-20200041ER	Topological Relation-Based Image Analysis using Graphs	10/1/2019	9/30/2022		0	406,641	406,641
Los Alamos National Lab	LANL-20200045ER	Direct Plutonium-239 Nuclear Magnetic Resonance: A Unique Tool for Understanding Plutonium	10/1/2019	9/30/2022		0	342,055	342,055
Los Alamos National Lab	LANL-20200056DR	Quantum Chemistry using Quantum Computers	10/1/2019	9/30/2022		0	1,510,716	1,510,716
Los Alamos National Lab	LANL-20200057DR	High-Gradient, High-Efficiency Radio-frequency Structures: Smart Design Based on Informed Break-down Suppression	10/1/2019	9/30/2022		0	1,696,914	1,696,914
Los Alamos National Lab	LANL-20200061DR	Prioritizing the Prior: Advanced Inversion Algorithms for Scientific Data Analysis	10/1/2019	9/30/2022		0	1,656,841	1,656,841
Los Alamos National Lab	LANL-20200065DR	In-Situ Inference: Bringing Advanced Data Science into Exascale Simulations	10/1/2019	9/30/2022		0	1,552,219	1,552,219
Los Alamos National Lab	LANL-20200073DR	Radiation Belt Remediation: A Complex Engineered System	10/1/2019	9/30/2022		0	1,627,411	1,627,411
Los Alamos National Lab	LANL-20200074ER	Effects of Strong Electronic Correlations on the Properties of Warm Dense Matter	10/1/2019	9/30/2022		0	319,373	319,373
Los Alamos National Lab	LANL-20200083DI	Beyond the Hugoniot: Dynamic Strength and Damage in Polymers	10/1/2019	9/30/2020		0	318,998	318,998

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Los Alamos National Lab	LANL-2020092DR	Basic Science Influencing Emplacement Signatures of Underground Nuclear Explosions	1/21/2020	9/30/2020		0	335,185	335,185
Los Alamos National Lab	LANL-20200104DR	Proximity Effects at Meso-, Nano-, and Atomic Scales: A new Path to Quantum Functionalities	10/1/2019	9/30/2022		0	1,548,744	1,548,744
Los Alamos National Lab	LANL-20200105ER	Passive MemComputing in Lithographic Arrays of Interacting Magnetic Nanoislands	10/1/2019	9/30/2022		0	343,002	343,002
Los Alamos National Lab	LANL-20200108DR	Predictive Understanding of Device Performance Through Innovative Measurement, Modeling, and Simulation on Radiochemical Dosimeters	10/1/2019	9/30/2022		0	1,711,379	1,711,379
Los Alamos National Lab	LANL-20200109DR	Directed Plant-Microbiome Evolution for Food and Biofuel Security	10/1/2019	9/30/2022		0	1,745,948	1,745,948
Los Alamos National Lab	LANL-20200111ER	Reshaping Bacterial Metabolic Output by Deciphering the Determinants of Messenger RiboNucleic Acid Decay	10/1/2019	9/30/2022		0	326,670	326,670
Los Alamos National Lab	LANL-20200116ER	Rare Earth Fission Product Element Separations by High Speed Counter-Current Chromatography	10/1/2019	9/30/2021		0	358,801	358,801
Los Alamos National Lab	LANL-20200121ER	The Genetic Patterns of Migration in Global Pandemics	10/1/2019	9/30/2022		0	283,507	283,507
Los Alamos National Lab	LANL-20200124ER	Superdetonation Shaped Charges	10/1/2019	9/30/2021		0	269,126	269,126
Los Alamos National Lab	LANL-20200125ER	Plutonium-239 Nuclear Magnetic Resonance Studies of Aging and Defects	10/1/2019	9/30/2022		0	327,145	327,145
Los Alamos National Lab	LANL-20200145ER	Exploration of Neutron-Star Crust Dynamics in the Era of Gravitational-Wave Astrophysics	10/1/2019	9/30/2022		0	303,787	303,787
Los Alamos National Lab	LANL-20200156ER	Dynamics of Quantum Phase Transitions	10/1/2019	9/30/2022		0	338,363	338,363
Los Alamos National Lab	LANL-20200161ER	Observing Life: Real-time Imaging of Transcription Using Unnatural Base-Pairs in Living Cells	10/7/2019	9/30/2022		0	302,914	302,914
Los Alamos National Lab	LANL-20200165ER	An Actinium-225/Bismuth-213 Generator Based on Millifluidics Controlled Electrodeposition for Radiopharmaceutical Applications	10/1/2019	9/30/2021		0	283,987	283,987
Los Alamos National Lab	LANL-20200180ER	Gossamer Radio Frequency Satellite Parabola Made by Additive Manufacturing	10/1/2019	9/30/2021		0	300,610	300,610
Los Alamos National Lab	LANL-20200182DR	Control Of Microstructural Instabilities in Composites: A Pathway to Realizing Damage Resistant Metals	10/1/2019	9/30/2022		0	1,600,129	1,600,129
Los Alamos National Lab	LANL-20200198ER	Plutonium Elasticity at Extreme Pressures using Gigahertz Ultrasound in a Diamond Anvil Cell	10/1/2019	9/30/2022		0	293,958	293,958
Los Alamos National Lab	LANL-20200200DR	Structured Electrodes for Energy Conversion, Energy Storage, and Ionic Separations	10/1/2019	9/30/2022		0	1,770,825	1,770,825
Los Alamos National Lab	LANL-20200201ER	Adaptive High-order Finite Element Arbitrary Lagrangian-Eulerian Methods for Multi-material Hydrodynamics	10/1/2019	9/30/2022		0	267,130	267,130
Los Alamos National Lab	LANL-20200209ER	Sampling the Unknown: Robust Modeling of Atomic Potentials	10/1/2019	9/30/2022		0	299,559	299,559
Los Alamos National Lab	LANL-20200213DR	Quantum Photonics with Semiconductor Nanocrystals	10/1/2019	9/30/2022		0	1,619,294	1,619,294
Los Alamos National Lab	LANL-20200222DR	Capturing the Origin and Evolution of Persistence Using Real-time, In vivo, Single Cell Transcriptomics	10/1/2019	9/30/2022		0	1,488,123	1,488,123
Los Alamos National Lab	LANL-20200225ER	Unlocking the Power of Tensor Cores with Mixed Precision Algorithms	10/1/2019	9/30/2022		0	270,414	270,414
Los Alamos National Lab	LANL-20200234ER	Predicting the Impact Sensitivity of New Explosives through Statistical Modeling	10/1/2019	9/30/2022		0	457,187	457,187
Los Alamos National Lab	LANL-20200240ER	Shedding Light on Quantum Phenomena in Topological Chiral Crystals	10/1/2019	9/30/2022		0	289,462	289,462
Los Alamos National Lab	LANL-20200252ER	Small Things Considered: Are Viruses as Important to Carbon Cycling in Soils as in Oceans	10/1/2019	9/30/2022		0	311,021	311,021
Los Alamos National Lab	LANL-20200270ER	Unveiling the Heating and Acceleration of Solar Wind by Touching the Sun with the Parker Solar Probe	10/1/2019	9/30/2022		0	303,913	303,913

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Los Alamos National Lab	LANL-20200274ER	Engineering green factories for the production of renewable chemicals	10/1/2019	9/30/2022		0	342,584	342,584
Los Alamos National Lab	LANL-20200276ER	Inverse Problem Approach to Spacecraft Charging Simulations	10/1/2019	9/30/2022		0	301,807	301,807
Los Alamos National Lab	LANL-20200278ER	Deep Learning Interferometric Synthetic-Aperture Radar	10/1/2019	9/30/2022		0	296,714	296,714
Los Alamos National Lab	LANL-20200285ER	Dielectric Antenna Array for Pinpoint Data/Energy Targeting	10/1/2019	9/30/2021		0	310,137	310,137
Los Alamos National Lab	LANL-20200287ER	Novel X-ray Free-electron Lasers Accelerator Architecture	10/1/2019	9/30/2022		0	280,158	280,158
Los Alamos National Lab	LANL-20200294ER	Transition Metal Nitrides for Efficient Nitrogen Electrocatalysis	10/1/2019	9/30/2022		0	329,607	329,607
Los Alamos National Lab	LANL-20200300ER	Nanotherapeutic Adjuvants for Sepsis	10/1/2019	9/30/2022		0	334,595	334,595
Los Alamos National Lab	LANL-20200311ER	The Role of Defects in Solid State Detonation Kinetics	10/1/2019	9/30/2022		0	334,145	334,145
Los Alamos National Lab	LANL-20200324ER	Understanding Mix in Fusion Implosions through Ion Temperature Imaging	10/1/2019	9/30/2022		0	325,199	325,199
Los Alamos National Lab	LANL-20200334ER	Particle Modeling of High-Altitude Nuclear Explosions	10/1/2019	9/30/2022		0	315,582	315,582
Los Alamos National Lab	LANL-20200338ER	Capturing the First Uranium Alkylidene Complex	10/14/2019	9/30/2022		0	318,784	318,784
Los Alamos National Lab	LANL-20200356ER	The Missing Link: Quantum Mechanics in Plasma Kinetic Modeling	10/1/2019	9/30/2022		0	290,305	290,305
Los Alamos National Lab	LANL-20200357ER	Design Principles for Skyrmions in f-electron Materials	10/1/2019	9/30/2022		0	337,083	337,083
Los Alamos National Lab	LANL-20200367ER	How do Pulsar Winds Shine in Tera Electron Volt	10/1/2019	9/30/2022		0	303,788	303,788
Los Alamos National Lab	LANL-20200375ER	Pushing Past the 100 Tesla Threshold: Designing a High Conductivity/High Strength Metallic Composite Conductor	10/1/2019	9/30/2022		0	343,831	343,831
Los Alamos National Lab	LANL-20200384ER	A Dynamical Approach to Low-Energy Fission	10/1/2019	9/30/2022		0	302,223	302,223
Los Alamos National Lab	LANL-20200393ER	Parallel Magnetic Resonance Imaging with a Multichannel Radio-frequency Atomic Magnetometer	10/1/2019	9/30/2022		0	364,063	364,063
Los Alamos National Lab	LANL-20200407ER	Emergent Infrared Localized Surface Plasmon Resonances in Doped Spinel Metal Oxide Nanomaterials	10/1/2019	9/30/2022		0	341,354	341,354
Los Alamos National Lab	LANL-20200410DI	Adaptive Machine Learning for Advanced Diagnostics and Autonomous Control of Particle Accelerators	12/13/2019	9/30/2020		0	311,038	311,038
Los Alamos National Lab	LANL-20200418ER	Measurement of Dynamic Friction via Kolsky Bar	10/1/2019	9/30/2022		0	337,738	337,738
Los Alamos National Lab	LANL-20200419ER	Broadband Terahertz Circular Dichroism Spectroscopy	10/1/2019	9/30/2022		0	290,295	290,295
Los Alamos National Lab	LANL-20200425ER	Defects and Functional Interfaces for Desalination	10/1/2019	9/30/2022		0	336,464	336,464
Los Alamos National Lab	LANL-20200435ER	Next Steps to Molecular Actinide Nitrides	10/1/2019	9/30/2021		0	98,492	98,492
Los Alamos National Lab	LANL-20200437MFR	Modernizing Detonator Production and Inspection: Robotics meets Additive and Digital Manufacturing	10/1/2019	9/30/2021		0	215,364	215,364
Los Alamos National Lab	LANL-20200439MFR	Superconducting Radio-frequency Cavities: Looking Beyond Niobium	10/1/2019	9/27/2020		0	200,720	200,720
Los Alamos National Lab	LANL-20200450MFR	Integrating Additive Manufacturing and Investment Casting for Complex Metal Architectures with Predictable Mechanics	10/1/2019	9/30/2021		0	212,884	212,884
Los Alamos National Lab	LANL-20200456MFR	Predictive Science for Inverse Problems in Non-proliferation	10/1/2019	9/27/2020		0	207,817	207,817
Los Alamos National Lab	LANL-20200461MFR	Special Carbide for Weapon Applications	10/1/2019	9/30/2021		0	158,574	158,574
Los Alamos National Lab	LANL-20200463MFR	The Use of Additive Manufacturing of High Explosives and its Application to Weapon Safety	10/1/2019	9/30/2021		0	220,020	220,020
Los Alamos National Lab	LANL-20200468MFR	Prompt, Photogated Negative Hydrogen Source	10/1/2019	9/30/2021		0	197,909	197,909
Los Alamos National Lab	LANL-20200470MFR	Glovebox Diagnostics to Support Plutonium Cleaning Operations	10/1/2019	9/27/2020		0	136,315	136,315
Los Alamos National Lab	LANL-20200474MFR	Understanding Homogenization Kinetics of As-Cast Plutonium Alloys to Improve Manufacturing of Weapons Components	10/1/2019	9/30/2021		0	186,379	186,379

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Los Alamos National Lab	LANL-20200481MFR	Rust, Dust, and a Passive Future - Resilient Actinide Materials	10/1/2019	9/30/2021		0	212,588	212,588
Los Alamos National Lab	LANL-20200485MFR	Toward Automated Interpretation of Large, High Resolution Computed Tomography Volumes	10/1/2019	9/30/2021		0	188,272	188,272
Los Alamos National Lab	LANL-20200488MFR	Solvent Anode Development for Electrorefining and Electromagnetic Isotope Separation	10/1/2019	9/27/2020		0	221,959	221,959
Los Alamos National Lab	LANL-20200495MFR	How Can the Granular Defects of Additive Manufacturing be Evaluated?	10/1/2019	9/30/2021		0	202,942	202,942
Los Alamos National Lab	LANL-20200496MFR	Revolutionary Separations for Efficient and Cost-Effective Americium-241 Production	10/1/2019	9/27/2020		0	221,590	221,590
Los Alamos National Lab	LANL-20200500MFR	In-Situ Ultrasound Grain Refinement in Electron Beam Additive Manufacturing for Improvement of High Strain-Rate Properties	10/1/2019	9/30/2021		0	217,440	217,440
Los Alamos National Lab	LANL-20200506MFR	Secure, Robust Multimedia Wireless Sensor Networks for Monitoring Critical Energy Infrastructure	10/1/2019	9/27/2020		0	215,424	215,424
Los Alamos National Lab	LANL-20200512ECR	Automatic Colormap Improvement in non-Euclidean Spaces	1/13/2020	1/12/2022		0	180,957	180,957
Los Alamos National Lab	LANL-20200529ECR	Using Thundercloud Illumination by Lightning to Understand Optical Signal Propagation in Nature	1/13/2020	1/12/2022		0	158,548	158,548
Los Alamos National Lab	LANL-20200539ER	Neutrino Physics with Short- and Long-baseline Experiments	12/9/2019	9/30/2022		0	448,915	448,915
Los Alamos National Lab	LANL-20200543ECR	Drug Discovery by Automated Adaptation of Chemical Structure and Identity	1/13/2020	1/12/2022		0	160,063	160,063
Los Alamos National Lab	LANL-20200554ECR	Studying Recombination in Ribonucleic Acid Viruses and its Implications for Outbreak Surveillance and Health Interventions	1/13/2020	1/12/2022		0	260,672	260,672
Los Alamos National Lab	LANL-20200555ECR	Understanding Optical Signatures from Natural and Artificial Aurora	1/13/2020	1/12/2022		0	60,620	60,620
Los Alamos National Lab	LANL-20200557ECR	Plutonium Defect Characterization through Mechanical Deformation	1/13/2020	1/12/2022		0	164,884	164,884
Los Alamos National Lab	LANL-20200561ECR	Photochemistry of Actinides in Ionic Liquids for Advanced Separations	1/13/2020	1/12/2022		0	142,047	142,047
Los Alamos National Lab	LANL-20200562ECR	Computational and Experimental Bioprospecting of Algae for Antimicrobial Compounds	1/13/2020	1/12/2022		0	159,660	159,660
Los Alamos National Lab	LANL-20200564ECR	Resolving Transport Processes in Multispecies Plasma Shock Waves	1/13/2020	1/12/2022		0	167,774	167,774
Los Alamos National Lab	LANL-20200570ECR	Exploring Inside the Los Alamos Neutron Science Center Hydrogen- Ion Source with Laser Absorption Techniques	1/13/2020	1/12/2022		0	121,827	121,827
Los Alamos National Lab	LANL-20200571ECR	Enhancing Bayesian Multivariate Adaptive Regression Spline Models Using Concepts from Deep Learning	7/1/2020	6/30/2022		0	36,292	36,292
Los Alamos National Lab	LANL-20200575ECR	Differentiable Programming: Bridging the Gap between Numerical Models and Machine Learning Models	6/8/2020	6/7/2022		0	71,041	71,041
Los Alamos National Lab	LANL-20200580ECR	Nitrogen: Abundant on Earth and Forgotten in Space	1/13/2020	1/12/2022		0	161,630	161,630
Los Alamos National Lab	LANL-20200584ECR	Quantum Chromodynamics Fragmentation Scaling Laws from Space-Time Reciprocity	6/29/2020	6/28/2022		0	56,989	56,989
Los Alamos National Lab	LANL-20200587ECR	Kinetic Study of a Magnetic-Mirror Wet-Wood-Burner Fusion Neutron Source	4/1/2020	3/31/2022		0	106,261	106,261
Los Alamos National Lab	LANL-20200588ECR	The Role of Defects in Mechanical Instabilities of Additively Manufactured Lattice Materials	1/13/2020	1/12/2022		0	160,299	160,299
Los Alamos National Lab	LANL-20200603ECR	Distributed Algorithms for Large-Scale Ordinary Differential/Partial Differential Equation Constrained Optimization Problems on Graphs	5/4/2020	5/3/2022		0	86,758	86,758
Los Alamos National Lab	LANL-20200604ER	Classical and Quantum Simulation of Physics	10/21/2019	9/30/2020		0	114,677	114,677
Los Alamos National Lab	LANL-20200614ER	Active Sensing for Short-Range Remote Detection and Characterization	1/13/2020	9/30/2020		0	753,171	753,171

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Los Alamos National Lab	LANL-20200620ER	Research into Advanced Methods for Sensitivity Analysis, Gap Analysis, and Experiment Optimization for Weapons, Nuclear Energy, and Global Security Applications	1/13/2020	9/30/2020		0	139,720	139,720
Los Alamos National Lab	LANL-20200621ER	Threat Quantity Indication of Special Nuclear Material	5/7/2020	9/30/2020		0	101,130	101,130
Los Alamos National Lab	LANL-20200625ER	Advanced Fusion Concept for National Security Applications	1/13/2020	2/28/2021		0	257,792	257,792
Los Alamos National Lab	LANL-20200628ER	Plutonium Gas Dynamics Using Small Samples and Laser Ablation Techniques	1/13/2020	9/30/2020		0	196,489	196,489
Los Alamos National Lab	LANL-20200632ER	Additive Manufacturing of Three Dimensional and Graded Density Explosive Structures	2/5/2020	2/28/2021		0	252,566	252,566
Los Alamos National Lab	LANL-20200633ER	Advancing Energetic Additive Manufacturing by Creating a New Class of Energetic Material	1/13/2020	9/30/2020		0	161,379	161,379
Los Alamos National Lab	LANL-20200641ER	In situ Characterization of Radiation-Induced Transport	1/13/2020	9/30/2020		0	188,988	188,988
Los Alamos National Lab	LANL-20200643ER	First Real-time Measurements of Quantum States of Ultracold Neutrons	1/13/2020	9/30/2020		0	89,835	89,835
Los Alamos National Lab	LANL-20200644ER	Synchrotron-based High-Energy Proton Radiography	1/13/2020	3/31/2021		0	49,732	49,732
Los Alamos National Lab	LANL-20200651ER	Machine Learning/Artificial Intelligence and Rich Sampling Campaign for Training a Practical In Silico Protein Folding Machine	4/9/2020	9/30/2020		0	118,943	118,943
Los Alamos National Lab	LANL-20200653ER	From One Dimensional Sequence to Three Dimensional Genomes: An Exascale Human Genome Project for the Next Generation of Biological Inquiry	1/21/2020	9/30/2020		0	237,302	237,302
Los Alamos National Lab	LANL-20200657ER	Two Level Systems by Design to Mitigate Decoherence in Superconducting Quantum Computers	1/21/2020	9/30/2020		0	219,033	219,033
Los Alamos National Lab	LANL-20200661ER	New Theoretical and Computational Capabilities for the Astrophysical Multi-Messenger Era	1/14/2020	9/30/2020		0	507,420	507,420
Los Alamos National Lab	LANL-20200663ER	Decoding the Function of Detonators	1/21/2020	9/30/2020		0	247,993	247,993
Los Alamos National Lab	LANL-20200664DI	Launch Vehicle Detection and Tracking System	1/14/2020	9/30/2021		0	448,912	448,912
Los Alamos National Lab	LANL-20200665DI	Design for Manufacture Pit Feasibility Study	1/9/2020	9/30/2021		0	1,659,876	1,659,876
Los Alamos National Lab	LANL-20200666DI	Trustworthy and Reliable Machine Learning	12/9/2019	9/30/2020		0	605,043	605,043
Los Alamos National Lab	LANL-20200667DI	Expedited High Explosive Formulation Through Processing-structure-property-performance Relationships	1/9/2020	9/30/2021		0	989,007	989,007
Los Alamos National Lab	LANL-20200668DI	Nuclear Material Control and Accounting /In-line Monitoring Capability (Dyanamic Materials Control)	3/2/2020	9/30/2021		0	495,311	495,311
Los Alamos National Lab	LANL-20200669DI	Artificial Intelligence for Sensing	2/18/2020	9/30/2021		0	443,384	443,384
Los Alamos National Lab	LANL-20200670DI	Advanced Algorithms for Multiphysics Applications on Modern Computer Architectures	2/13/2020	9/30/2020		0	783,785	783,785
Los Alamos National Lab	LANL-20200671DI	Quantum Algorithm Development for Optimization	12/13/2019	9/30/2021		0	292,990	292,990
Los Alamos National Lab	LANL-20200672DI	Hybrid Materials Architectures for Quantum Information Science	1/2/2020	9/30/2020		0	458,304	458,304
Los Alamos National Lab	LANL-20200674ER	Increasing Transport: The Next-Generation Electrolytic Oxide Reduction Cell	4/27/2020	9/30/2020		0	221,445	221,445
Los Alamos National Lab	LANL-20200676PRD1	Importance of Metal/Oxide Interfaces to Design and Tailor Composite Material Properties.	1/27/2020	1/26/2022		0	95,793	95,793
Los Alamos National Lab	LANL-20200677PRD1	Error Correction and Speed-up of Near-term Quantum Computing Architectures	1/27/2020	1/26/2022		0	94,098	94,098
Los Alamos National Lab	LANL-20200678PRD1	Quantum Simulation of Quantum Field Theories	9/7/2020	9/6/2022		0	7,283	7,283
Los Alamos National Lab	LANL-20200679ER	In Situ Methods to Inform Design of Additively Manufactured Lattice Structures	2/5/2020	9/30/2020		0	142,020	142,020
Los Alamos National Lab	LANL-20200680PRD1	Strain Susceptibility of Quantum Critical Fluctuations	3/30/2020	3/29/2023		0	88,126	88,126
Los Alamos National Lab	LANL-20200681PRD1	The Seismic Noise is the Signal: Applying Machine Learning to Earthquake Forecasting	3/9/2020	3/8/2023		0	100,705	100,705

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Los Alamos National Lab	LANL-20200682PRD1	Forecasting Valley Fever Disease Risk Using Machine Learning	2/18/2020	2/17/2022		0	89,793	89,793
Los Alamos National Lab	LANL-20200684PRD2	A Study of Diffusion Around Pulsar Wind Nebulae	3/2/2020	3/1/2022		0	71,825	71,825
Los Alamos National Lab	LANL-20200685PRD2	Electrically Pumped Laser Diodes Using Charged Colloidal Quantum Dots	4/6/2020	4/5/2022		0	65,835	65,835
Los Alamos National Lab	LANL-20200686PRD2	Design and Discovery of Novel, Two-Dimensional f-electron Quantum Materials	4/27/2020	4/26/2022		0	62,374	62,374
Los Alamos National Lab	LANL-20200687PRD2	Towards Data Science Driven Multi-physics Modeling to Probe Neutron Star Mergers	9/8/2020	9/7/2022		0	7,061	7,061
Los Alamos National Lab	LANL-20200688PRD2	Atomistic Modeling and Machine Learning for Bio-advantaged Polymer Design	6/1/2020	5/31/2022		0	42,310	42,310
Los Alamos National Lab	LANL-20200690ER	Detection and Attribution of No-Analog Fire	5/14/2020	9/30/2020		0	175,181	175,181
Los Alamos National Lab	LANL-20200691ER	Fundamentals of Chemical Exchange for Advanced Isotope Separations	6/9/2020	9/30/2020		0	240,818	240,818
Los Alamos National Lab	LANL-20200692ER	Development of Improved High Temperature Fuel and Cladding Materials for Advanced Reactors	4/14/2020	9/30/2020		0	288,629	288,629
Los Alamos National Lab	LANL-20200694ER	Tracking the Severe Acute Respiratory Syndrome-Coronavirus 2019 Epidemic Using the Evolutionary Rate	4/9/2020	9/30/2020		0	162,648	162,648
Los Alamos National Lab	LANL-20200695ER	Combating Antibiotic Resistance with Phage Therapy	4/1/2020	9/30/2020		0	222,058	222,058
Los Alamos National Lab	LANL-20200696ER	Investigation of Severe Acute Respiratory Syndrome-Coronavirus 2019 Interaction for Development of Lung-protective Therapies	4/9/2020	9/30/2020		0	118,692	118,692
Los Alamos National Lab	LANL-20200697ER	Informing Mitigation Strategies for Coronavirus 2019	3/23/2020	9/30/2020		0	219,567	219,567
Los Alamos National Lab	LANL-20200698ER	Modeling Hospital/Healthcare Surge Capacity in Response to Coronavirus 2019	3/23/2020	9/30/2020		0	126,539	126,539
Los Alamos National Lab	LANL-20200699ER	Developing a National Spatial-Temporal Epidemiology Model for Decision Support	3/26/2020	9/30/2020		0	121,654	121,654
Los Alamos National Lab	LANL-20200700ER	Forecasting Confirmed Cases and Deaths for Coronavirus 2019	3/23/2020	9/30/2020		0	142,750	142,750
Los Alamos National Lab	LANL-20200705ER	Design and Syntheses of Surface Epitope Peptides and Peptide Mimetic Motives for Pan-Corona Vaccines	4/9/2020	9/30/2020		0	26,501	26,501
Los Alamos National Lab	LANL-20200706ER	Strategies for Coronavirus Vaccines to Protect Against the Current Pandemic Strains and Emergent Zoonoses	3/26/2020	9/30/2020		0	125,534	125,534
Los Alamos National Lab	LANL-20200711ER	Phylogenetic Methods for Actionable Understanding of the Coronavirus 2019 Pandemic	4/9/2020	9/30/2020		0	123,692	123,692
Los Alamos National Lab	LANL-20200712ER	Designing Reusable Smart Personal Protective Equipment to Fight The Next Pandemic	4/9/2020	9/30/2020		0	109,506	109,506
Los Alamos National Lab	LANL-20200717ER	Rapid On-Demand Synthesis of Anti-Viral Favipiravir for the Treatment of Coronavirus 2019	4/9/2020	9/30/2020		0	200,851	200,851
Los Alamos National Lab	LANL-20200720ER	Leveraging Los Alamos National Laboratory Personal Protective Equipment Expertise to Inform Public Health Decisions Related to Coronavirus 2019	4/9/2020	9/30/2020		0	122,686	122,686
Los Alamos National Lab	LANL-20200721ER	Misinformation and Critical Disease Transmission Behaviors in Online Data	4/9/2020	9/30/2020		0	169,722	169,722
Los Alamos National Lab	LANL-20200722ER	Structural and Computational Identification of Potential Drugs Targeting Transmembrane Serine Protease 2, a Host Protease Crucial for Coronavirus 2019 Infection	4/9/2020	9/30/2020		0	146,105	146,105
Los Alamos National Lab	LANL-20200732ER	Multiplex Assay Design for Respiratory Pathogens: Increasing Coronavirus 2019 Testing Bandwidth	4/9/2020	9/30/2020		0	257,427	257,427
Los Alamos National Lab	LANL-20200733ER	Lifeline: an Extensible, Agent-Based Model for Critical Healthcare Supply Chains	4/9/2020	9/30/2020		0	122,371	122,371
Los Alamos National Lab	LANL-20200743ER	Quantifying the Within Host Dynamics of Severe Acute Respiratory Syndrome-Coronavirus 2019	4/9/2020	9/30/2020		0	127,345	127,345

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Los Alamos National Lab	LANL-20200747DI	Investigation of the Role of Actinides on the Local Structure of Molten Salts Using Neutron Pair distribution Function Analysis	5/28/2020	7/1/2021		0	48,633	48,633
Los Alamos National Lab	LANL-20200748DI	Atomic Armor Protecting Plutonium	5/21/2020	9/30/2020		0	245,108	245,108
Los Alamos National Lab	LANL-20200749DI	Accelerated Development of Additively Manufactured Uranium Oxide Fuels for Geometries Avoiding Fuel Lifetime-limiting Irradiation Swelling Using Bulk Neutron Characterization	5/22/2020	3/31/2021		0	53,555	53,555
Los Alamos National Lab	LANL-20200750DI	Formation of Actinide Amalgams from Ionic Liquids	5/21/2020	9/30/2020		0	164,364	164,364
Los Alamos National Lab	LANL-20200751ER	Developing Dark Matter Detectors from Novel Narrow Band Gap Materials	5/20/2020	9/30/2020		0	75,873	75,873
Los Alamos National Lab	LANL-20200752PRD3	The Next Generation of Aerosol Optical Models: Humidity Dependence and Chemical Processing	6/15/2020	6/14/2022		0	39,598	39,598
Los Alamos National Lab	LANL-20200753PRD3	Decipher the Coupled Plasma and Atomic Physics for Reactor Plasma Exhaust	8/3/2020	8/2/2022		0	20,607	20,607
Los Alamos National Lab	LANL-20200754DI	Ultrasonic Filtration: A Revolutionary Technology for Hydroxide Precipitation	6/3/2020	9/30/2020		0	72,597	72,597
Los Alamos National Lab	LANL-20200755PRD3	Design and Discovery of Novel High-entropy Alloys	9/14/2020	9/13/2022		0	5,044	5,044
Los Alamos National Lab	LANL-20200756PRD3	Topological Superconductivity in Van Der Waals Materials as a Platform for Qubits	6/15/2020	6/14/2022		0	35,936	35,936
Los Alamos National Lab	LANL-20200757PRD3	Electrically Driven Optoelectronic Plasmonic Nanodevice in Carbon Nanotubes	8/17/2020	8/16/2022		0	15,527	15,527
Los Alamos National Lab	LANL-20200761ER	A Rapid Intermediate-Fidelity Indoor Flow and Transport and Dispersion Model for Predicting the Transmission of Infectious Diseases	6/22/2020	9/30/2020		0	43,671	43,671
Los Alamos National Lab	LANL-20200763ER	A Catalytic Acetylcholine Reactivator as an Effective Countermeasure of Chemical Warfare Agent, Non-Traditional Agent, and Organophosphonate Exposures	7/6/2020	9/30/2020		0	15,973	15,973
Los Alamos National Lab	LANL-20200764ER	Path to High-energy Proton Radiography - Upgrade at the Los Alamos Neutron Science Center	6/16/2020	9/30/2020		0	44,479	44,479
Los Alamos National Lab	LANL-20200765ER	An Alternative Approach to Inertial Confinement Fusion Ignition and Burn Propagation at the National Ignition Facility	6/15/2020	9/30/2021		0	99,485	99,485
Los Alamos National Lab	LANL-20200766ER	Detonator Powder Pressing Study	7/6/2020	9/30/2020		0	29,412	29,412
Los Alamos National Lab	LANL-20200769PRD3	Geochemical-Geomechanical Feedback in Stressed Fracture Systems	8/31/2020	8/30/2022		0	9,835	9,835
Los Alamos National Lab	LANL-20200770DR	The Remote Elemental, Molecular, and Isotopic Camera	8/4/2020	9/30/2021		0	40,108	40,108
Los Alamos National Lab	LANL-20209999ER	Post-project Debits and Credits	10/1/2019	9/30/2020		0	42,050	42,050
National Renewable Energy	0600.10001.19.12.01	Elucidate Regulatory Network Connectivity to Enable Gene-Circuit Redesign for Electrosynthesis of Biofuels/Chemicals	10/1/2018	9/30/2020		0	253,583	253,583
National Renewable Energy	0600.10001.19.41.01	Cell-Free Electrocatalytic Conversion of Carbon Dioxide to Butanol Using Curtailed Electricity	10/1/2018	9/30/2020		0	265,115	265,115
National Renewable Energy	0600.10001.20.15.01	Quantum Spin Probes for Living Electronic Circuitry	10/1/2019	9/30/2021		0	253,574	253,574
National Renewable Energy	0600.10001.20.43.01	Imaging the Native Three Dimensional Structures of Biological Energy Conversion Complexes	10/1/2019	9/30/2021		0	239,296	239,296
National Renewable Energy	0600.10001.20.46.01	Towards Development of a Plastic-Degrading Fungal "Super Bug"	10/1/2019	9/30/2021		0	155,604	155,604
National Renewable Energy	0600.10001.20.72.01	Cyanobacteria that Sequester Phosphorus from Wastewater	1/10/2020	9/30/2020		0	17,271	17,271
National Renewable Energy	0600.10001.20.77.01	Developing Nuclear Magnetic Resonance-based Methods for Metabolic Flux Analysis of Clostridium thermocellum	10/1/2019	9/30/2020		0	42,136	42,136

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National Renewable Energy	0600.10002.18.33.01	Realistic, in-situ Modeling of Premier and Developing Catalysts for the Electrolysis of Water for the Hydrogen Economy	1/3/2018	1/2/2021		0	65,452	65,452
National Renewable Energy	0600.10002.19.12.01	Fast and Accurate Mesoscale Models for Bioenergy Conversion Processes	10/1/2018	9/30/2020		0	147,851	147,851
National Renewable Energy	0600.10002.19.13.01	Machine Learning to Enable Chemically Informative Atomistic Simulation in Complex Environments	10/1/2018	9/30/2020		0	206,468	206,468
National Renewable Energy	0600.10002.19.13.02	Physics-Informed Deep Learning to Enable Energy System Transformations	10/1/2018	9/30/2020		0	192,623	192,623
National Renewable Energy	0600.10002.20.13.01	Quantum Computing Algorithms for Clean Energy Systems Research	10/1/2019	9/30/2022		0	195,028	195,028
National Renewable Energy	0600.10002.20.13.02	Assessment of Reinforcement Learning for Model Problems	10/1/2019	9/30/2021		0	202,136	202,136
National Renewable Energy	0600.10002.20.13.03	Novel non-Platinum Group Metal Catalysts for Oxygen Evolution	10/1/2019	9/30/2021		0	267,249	267,249
National Renewable Energy	0600.10002.20.14.01	Uncertainty Visualization and Quantification for Energy Systems Decision Making	10/1/2019	9/30/2021		0	284,184	284,184
National Renewable Energy	0600.10002.20.72.01	Computational Modeling of Electrochemical Conversion of Carbon Dioxide	1/1/2020	9/30/2020		0	20,986	20,986
National Renewable Energy	0600.10002.20.73.01	Techno-Economic Analysis of a Novel Smart Home Optimal Control Framework based on Cloud Computing and Deep Reinforcement Learning	1/15/2020	9/30/2020		0	37,697	37,697
National Renewable Energy	0600.10002.20.75.01	Scalable Deep Reinforcement Learning through Derivative-Free Policy Search	1/15/2020	9/30/2020		0	40,560	40,560
National Renewable Energy	0600.10002.20.93.01	Framework for Quantum Computing in Condensed Phase	1/15/2020	9/30/2020		0	11,026	11,026
National Renewable Energy	0600.10004.19.11.01	Integrated Design and Analysis of Hybrid Power Plants	10/1/2018	9/30/2020		0	438,447	438,447
National Renewable Energy	0600.10004.20.71.01	Recyclable-by-Design Materials for Wind Turbine Composite Structures	11/1/2019	9/30/2020		0	107,867	107,867
National Renewable Energy	0600.10005.18.40.01	Tailoring the Active Site for Structure-Sensitive Electrocatalytic Carbon Dioxide Reduction through Nanoscaling, Alloying, and Ligand-Promoted Stabilization	1/2/2018	9/30/2020		0	247,732	247,732
National Renewable Energy	0600.10005.18.77.01	Phage-based Deoxyribonucleic Cargo Delivery Platform for Enhanced Strain Engineering	7/1/2018	9/30/2020		0	184,046	184,046
National Renewable Energy	0600.10005.19.12.01	Photo-Gated Covalent Organic Frameworks for Biomimetic Cascade Catalysis	10/1/2018	9/30/2020		0	379,509	379,509
National Renewable Energy	0600.10005.19.31.01	Catalytic Production of High-Value Chemicals from Waste Plastics: Depolymerization Through Carbon-Hydrogen Bond Activation and Cross Metathesis	1/7/2019	1/6/2022		0	99,605	99,605
National Renewable Energy	0600.10005.19.46.01	Nano-Catalysts for Converting Carbon Dioxide and Electrons to Fuels with Protonic Ceramic Electrolyzers	10/1/2018	9/30/2020		0	292,230	292,230
National Renewable Energy	0600.10005.20.12.01	Seawater Desalination in Novel Simulated Moving Beds	10/1/2019	9/30/2022		0	263,392	263,392
National Renewable Energy	0600.10005.20.44.01	Combined Capture and Electrochemical Conversion of Carbon Dioxide	1/10/2020	9/30/2020		0	7,252	7,252
National Renewable Energy	0600.10005.20.46.01	Polymer Recycling and Upcycling Via Catalytic Dehydrogenative Depolymerization	10/1/2019	9/30/2021		0	145,929	145,929
National Renewable Energy	0600.10005.20.92.01	Muconate as a Platform Molecule	2/20/2020	9/30/2020		0	19,242	19,242
National Renewable Energy	0600.10007.19.15.01	Transportation System Macro-Model	10/1/2018	9/30/2020		0	198,576	198,576
National Renewable Energy	0600.10007.20.10.01	Transformational Analysis through Behavioral Science	10/1/2019	9/30/2021		0	150,958	150,958
National Renewable Energy	0600.10007.20.31.01	In-Situ Investigations of Autoignition Linking Ignition Properties with Fuel Composition	10/21/2019	10/20/2022		0	133,605	133,605
National Renewable Energy	0600.10007.20.31.02	Enabling Agile Urban Planning on a Transparent and Robust Foundation	5/4/2020	5/3/2023		0	61,764	61,764

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
National Renewable Energy	0600.10007.20.91.01	Design Stage Project: Experimental Apparatus to Measure Laminar and Turbulent Flame Speeds	5/20/2020	9/30/2020		0	60,531	60,531
National Renewable Energy	0600.10008.18.33.01	Combined Thermal Energy Storage & Moisture Control using Salt Hydrates	8/20/2018	8/19/2021		0	148,888	148,888
National Renewable Energy	0600.10008.20.13.01	Super-Adsorbing Porous Thermo-Responsive Desiccants for Energy Efficiency and Thermal Comfort in Buildings	10/1/2019	9/30/2021		0	285,938	285,938
National Renewable Energy	0600.10008.20.13.02	Directional Heat Transfer and Thermal Management System for Buildings	10/1/2019	9/30/2021		0	232,137	232,137
National Renewable Energy	0600.10009.17.01.02	Developing Superlattices of Perovskites (Methylammonium Lead Iodide) Containing Lead Quantum Dots	1/3/2019	1/2/2020		0	18,743	18,743
National Renewable Energy	0600.10009.17.02.01	Synthesis and Characterization of Well-Defined Organic Supramolecular Structures with Size-Dependent Optoelectronic Properties	5/22/2017	5/21/2020		0	54,622	54,622
National Renewable Energy	0600.10009.18.11.02	Development of a Gradient Solid Electrolyte for All Solid-State Lithium-Ion Batteries	10/1/2017	9/30/2020		0	312,537	312,537
National Renewable Energy	0600.10009.18.12.02	Carbon Nanotube Electrodes for Perovskite Solar Cells	10/1/2017	9/30/2020		0	125,932	125,932
National Renewable Energy	0600.10009.18.40.01	Redox Activity of Single-Walled Carbon Nanotube-Clostridium Hybrid for Microbial Electrosynthesis	10/1/2017	3/1/2020		0	4,548	4,548
National Renewable Energy	0600.10009.19.12.01	Cost-Effective Three-Five Semiconductor/Silicon Integration Enabled by Thin-Film Vapor-Liquid-Solid Growth	10/1/2018	9/30/2020		0	212,765	212,765
National Renewable Energy	0600.10009.19.31.01	Driving Ion Transport with Liquid-Like Molecular Dynamics in Solid-State Electrolytes	12/17/2018	12/16/2021		0	138,844	138,844
National Renewable Energy	0600.10009.19.32.01	Solid-State Optoelectronic Devices Based on Low-Dimensional Perovskite Triplet Sensitization and Molecular Photon Upconversion	8/12/2019	8/11/2022		0	170,446	170,446
National Renewable Energy	0600.10009.19.33.01	Membrane Electrode Assembly Architecture Using Two-Dimensional Material to Mitigate Water Electrolysis Crossover	6/10/2019	6/9/2022		0	172,150	172,150
National Renewable Energy	0600.10009.19.34.01	Characterization and Modeling of Thermo-Radiative Cells for Thermal Energy Harvesting	9/9/2019	9/8/2022		0	169,773	169,773
National Renewable Energy	0600.10009.19.40.01	Facilitating Gas-Phase Electrochemical Carbon Dioxide Reduction	10/1/2018	9/30/2020		0	245,392	245,392
National Renewable Energy	0600.10009.19.43.01	Electrochemical Reduction of Gaseous Carbon Dioxide to Formate/Formic Acid	10/1/2018	9/30/2020		0	123,621	123,621
National Renewable Energy	0600.10009.20.15.01	Investigations and Improvements in Carbon-Carbon Coupling Electrocatalysis for Carbon Bond Forming Reactions from Common Carbon Feedstocks.	10/1/2019	9/30/2021		0	226,872	226,872
National Renewable Energy	0600.10009.20.31.01	Operando Ultrafast – Steady State Study of Mechanisms in Plasmonic Selectivity Enhancement of the Carbon Dioxide Reduction Reaction	3/1/2020	2/28/2023		0	86,520	86,520
National Renewable Energy	0600.10009.20.46.01	Surface and Reactor Engineering Electrochemical Carbon Dioxide Reduction	10/1/2019	9/30/2021		0	1,015,696	1,015,696
National Renewable Energy	0600.10009.20.75.01	Novel Cation Conducting Polymer Electrolytes with Extreme Acidity and Acid Density	3/1/2020	9/30/2020		0	29,948	29,948
National Renewable Energy	0600.10010.18.40.02	Autonomous Energy Systems	1/2/2018	9/30/2020		0	2,199,744	2,199,744
National Renewable Energy	0600.10010.91.01.01	Dynamic Thermal Emulator for non-Linear at-Scale Thermodynamic Analysis	7/10/2019	9/30/2020		0	152,208	152,208
National Renewable Energy	0600.10011.19.10.01	Infinite-Inertia Inverter-Dominant Power Systems	10/1/2018	9/30/2020		0	153,709	153,709
National Renewable Energy	0600.10011.19.14.01	Self-Evolving, Resilient Distribution Grids Using Dynamic Network Reconfiguration and Grid Edge Intelligence	10/1/2018	9/30/2020		0	257,483	257,483

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National Renewable Energy	0600.10011.19.31.01	Robust Data-Driven Framework for System Identification, Dynamic State Estimation, and Autonomous Control of Electric Power Systems Using the Koopman Operator Theory	5/27/2019	5/26/2022		0	139,891	139,891
National Renewable Energy	0600.10011.20.12.01	Autonomous Blackstart Using Inverter-based Resources	10/1/2019	9/30/2021		0	145,778	145,778
National Renewable Energy	0600.10011.20.31.01	Integrated Probabilistic Wind, Solar and Load Forecasting	6/1/2020	5/31/2023		0	45,071	45,071
National Renewable Energy	0600.10011.20.71.01	Predictive Energy Analytics for Knowledge Behind-the-Meter	2/19/2020	9/30/2020		0	55,037	55,037
National Renewable Energy	0600.10012.18.40.01	High Performance Perovskites: Nucleating United States Capability in Perovskite Science and Technology	1/2/2018	9/30/2020		0	266,419	266,419
National Renewable Energy	0600.10012.18.40.02	Advancing Beyond Density Functional Theory Methods and Application to Optoelectronic Perovskites	1/2/2018	9/30/2020		0	98,208	98,208
National Renewable Energy	0600.10012.18.90.01	Principal Investigator Initiated Innovative Idea	11/1/2018	9/30/2020		0	51,741	51,741
National Renewable Energy	0600.10012.19.40.01	Next-Generation Ion Batteries—From Materials to Manufacturing	10/1/2018	9/30/2021		0	729,242	729,242
National Renewable Energy	0600.10014.18.33.01	Precise Deposition of Novel Nitrides: Heteroepitaxial Integration with Existing Nitrides for Property Manipulation	5/29/2018	5/28/2021		0	95,510	95,510
National Renewable Energy	0600.10014.19.12.02	Efficient Carbon Nanotube-Based Exciton-Polariton Light Sources and Quantum Information Elements	10/1/2018	9/30/2020		0	225,807	225,807
National Renewable Energy	0600.10014.19.15.01	Controlling Structural and Electronic Phase Transitions in Novel Materials for Neuromorphic Applications	10/1/2018	9/30/2020		0	391,277	391,277
National Renewable Energy	0600.10014.20.12.01	Tuning Functionality in Quantum Materials	10/1/2019	9/30/2021		0	269,577	269,577
National Renewable Energy	0600.10014.20.12.02	Discover and Design of Material-Defect Systems for Quantum Applications	10/1/2019	9/30/2020		0	84,867	84,867
National Renewable Energy	0600.10014.20.14.01	Wide-Bandgap Oxide Materials for High-Temperature Electronic Devices	10/1/2019	9/30/2021		0	353,090	353,090
National Renewable Energy	0600.10014.20.31.01	Metal Halide Perovskite X-Ray Detectors	4/6/2020	4/5/2023		0	56,836	56,836
National Renewable Energy	0600.10014.20.72.01	Development of Current Focusing Architectures to Enable Electrically-pumped Perovskite Vertical Cavity Surface Emitting Lasers	3/1/2020	9/30/2020		0	31,319	31,319
National Renewable Energy	0600.10014.20.72.02	Atomic Layer Deposition of Zirconium Oxysulfide, A New Hole-Conducting Transparent Conductor	3/1/2020	9/30/2020		0	31,675	31,675
National Renewable Energy	0600.10014.20.72.03	Micro-Photoluminescence Capability in the Superconducting Magnet	3/1/2020	9/30/2020		0	44,643	44,643
National Renewable Energy	0600.10014.20.73.01	Corrosive Attack Resistant Boron-Nitride Synthesis	3/1/2020	9/30/2020		0	27,114	27,114
National Renewable Energy	0600.10016.19.14.01	Integrated Electricity Market Toolkit	10/1/2018	9/30/2020		0	394,618	394,618
National Renewable Energy	0600.10016.19.44.01	Prototype Scalable, Integrated Modeling Architecture	10/1/2018	9/30/2021		0	966,023	966,023
National Renewable Energy	0600.10016.20.14.01	Expanding the Scope: A Model for Intersectoral and Economy-Wide Impact Analysis	10/1/2019	9/30/2022		0	249,726	249,726
National Renewable Energy	0600.10016.20.14.02	Multi-Perspective Analysis of Future Energy System Structures	10/1/2019	9/30/2022		0	224,784	224,784
National Renewable Energy	0600.10016.20.15.01	Circular Economy Lifecycle Assessment and Visualization	10/1/2019	9/30/2022		0	308,570	308,570
National Renewable Energy	0600.10016.20.75.01	High Performance Computing for Food-Energy-Water Systems Modeling	1/15/2020	9/30/2020		0	50,370	50,370
National Renewable Energy	0600.10016.20.75.02	Negative Emissions Technologies	1/15/2020	9/30/2020		0	33,956	33,956
National Renewable Energy	0600.10016.20.91.01	A Novel Approach to Mitigating Environmental Impacts of Brine Discharge with Renewable Energy Systems	1/15/2020	9/30/2020		0	8,814	8,814
National Renewable Energy	0600.10016.20.92.01	High Penetration Renewable Systems: Societal Impacts and Social Acceptance	1/15/2020	9/30/2020		0	9,056	9,056

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National Renewable Energy	0600.10016.20.95.01	Effects of the Generator Operational Flexibility in Commercial Power and Industry Sectors on Emissions of Particulate Matter _{2.5} and its Precursors	1/15/2020	9/30/2020		0	13,420	13,420
National Renewable Energy	0600.10017.20.70.01	Co-Optimized Integration of Distributed Energy Resources	2/19/2020	9/30/2020		0	61,713	61,713
National Renewable Energy	0600.102020.02.01.03	Costs on Closed Projects	10/1/2019	9/30/2020		0	121,549	121,549
National Renewable Energy	0600.11543.20.40.01	The Polymers Initiative: Diels-Alder Crosslink for Diverse Thermoset Applications	10/1/2019	9/30/2021		0	299,093	299,093
National Renewable Energy	0600.11543.20.40.02	Technology Assessment of Novel Electricity Driven Reactor Systems	1/10/2020	9/30/2020		0	38,713	38,713
National Renewable Energy	0600.11543.20.40.03	Test Station Construction	2/12/2020	9/30/2020		0	546,132	546,132
National Renewable Energy	0600.11543.20.71.01	Techno-economic and Supply-chain Assessments of Plastics Collection and Processing for Chemical Recycling	1/10/2020	9/30/2020		0	34,853	34,853
National Renewable Energy	0600.11544.20.40.01	Science of Resilience for Energy Systems	10/1/2019	9/30/2022		0	877,154	877,154
National Renewable Energy	0600.11544.20.71.01	Immersive Virtual Reality for Energy Security and Resilience	2/19/2020	9/30/2020		0	50,589	50,589
Nevada National Security Site	J1701038	Single-crystal x-ray spectro-polarimeter	10/1/2017	9/30/2019		0	5,224	5,224
Nevada National Security Site	J1701139	Strength of shock-induced instabilities	10/1/2018	9/30/2020		0	29	29
Nevada National Security Site	J1701158	Strategic studies in dynamic material response	10/1/2017	9/30/2020		0	537,396	537,396
Nevada National Security Site	J1701260	Detector wall research for fast gamma signal detection	10/1/2019	9/30/2021		0	154,697	154,697
Nevada National Security Site	J1701B37	X-Ray Phase Contrast Imaging for Dynamic Material Mix Experiments - University Subcontracts	10/1/2018	9/30/2019		0	19,098	19,098
Nevada National Security Site	J1702016	A multi-axial time resolved spectroscopic technique	10/1/2015	9/30/2018		0	(2,843)	(2,843)
Nevada National Security Site	J1702050	Z-pinch and laser ablation driven high-yield neutron source	10/1/2019	9/30/2021		0	297,973	297,973
Nevada National Security Site	J1702059	Portable Neutron Imaging System	10/1/2018	9/30/2021		0	333,747	333,747
Nevada National Security Site	J1702077	Semiconductor-Based High-Yield X-Ray Photocathode	10/1/2016	9/30/2019		0	(3,361)	(3,361)
Nevada National Security Site	J1702A59	High-fidelity neutron radiography source development	10/1/2018	9/30/2020		0	62,620	62,620
Nevada National Security Site	J1703019	Dynamic measurements of the structural evolution	10/1/2018	9/30/2021		0	411,322	411,322
Nevada National Security Site	J1703030	Multi-layered avalanche diamond detector for fast neutron applications	10/1/2019	9/30/2021		0	299,977	299,977
Nevada National Security Site	J1703067	Dynamic Test Prediction and Characterization	10/1/2016	9/30/2019		0	3,913	3,913
Nevada National Security Site	J1703097	Man-Portable Dense Plasma Focus	10/1/2016	9/30/2019		0	13,869	13,869
Nevada National Security Site	J1703099	Equation of state properties of additively manufactured metals	1/2/2019	9/30/2020		0	17,261	17,261
Nevada National Security Site	J1703159	High-performance computational modeling of strong ground motion for seismic response analysis with implications for high-hazard and/or nuclear facilities and critical infrastructure	10/1/2018	9/30/2020		0	300,258	300,258
Nevada National Security Site	J1703200	Fast Methods for Geometric Inference in Limited-Angle Tomography	10/1/2019	9/30/2021		0	292,052	292,052
Nevada National Security Site	J1703300	Enhancing deep cavity detection using orthogonal measurement techniques	10/1/2019	9/30/2020		0	193,911	193,911
Nevada National Security Site	J1703496	Next-Generation Photo-Multiplier Detectors	10/1/2015	9/30/2018		0	(133)	(133)
Nevada National Security Site	J1703A97	Man-portable dense plasma focus for neutron interrogation applications	10/1/2018	9/30/2019		0	(68,254)	(68,254)
Nevada National Security Site	J1703B19	Dynamic measurements of the structural evolution - University Subcontracts	10/1/2018	9/30/2021		0	(13,039)	(13,039)
Nevada National Security Site	J1703B97	Man-portable dense plasma focus for neutron interrogation applications	10/1/2018	9/30/2019		0	(11,800)	(11,800)
Nevada National Security Site	J1703C49	Advanced Characterization of Spatial Aspects	10/1/2019	9/30/2021		0	280,451	280,451
Nevada National Security Site	J1704020	Incorporation of physics phenomenology into an adaptive algorithm framework	10/1/2019	9/30/2021		0	391,470	391,470

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Nevada National Security Site	J1704027	Algorithm Development for Targeted Isotopes	10/1/2016	9/30/2019		0	8,828	8,828
Nevada National Security Site	J1704060	Evaluating use of National Aeronautics and Space Administration Nowcast of Atmospheric Ionizing Radiation for Aviation Safety System	10/1/2019	9/30/2021		0	196,020	196,020
Nevada National Security Site	J1705020	Micro-Ion Traps for Real-Time Chemical Analysis in Harsh Environments	10/1/2019	9/30/2021		0	376,205	376,205
Nevada National Security Site	J1705027	Gas-Phased Ion-Neutral Interactions of Cerium Ions with Deuterium	10/1/2016	9/30/2019		0	54	54
Nevada National Security Site	J1705039	Compact heterodyne spectrometer for long-wavelength infrared detection	10/1/2018	9/30/2020		0	270,594	270,594
Nevada National Security Site	J1705069	Dual comb spectroscopy for definitive identification of gas	10/1/2018	9/30/2021		0	335,706	335,706
Nevada National Security Site	J1705080	Dynamic Sub-micron Particulate Behavior in Turbulent Media	10/1/2019	9/30/2021		0	395,587	395,587
Nevada National Security Site	J1705108	A spectral evaluation of the application of super-resolution imagery	10/1/2017	9/30/2020		0	320,772	320,772
Nevada National Security Site	J1705119	Millimeter wave imaging diagnostic for high-explosive fireball characterization	10/1/2018	9/30/2021		0	297,727	297,727
Nevada National Security Site	J1705120	High Energy Neutron Production in a Laser-Generated High Density Plasma	10/1/2019	9/30/2021		0	318,915	318,915
Nevada National Security Site	J1705129	Fast temperature measurements using dispersive time-domain spectroscopy	10/1/2018	9/30/2019		0	2,103	2,103
Nevada National Security Site	J1705139	Cognitive hybrid radio waveforms	10/1/2018	9/30/2020		0	333,984	333,984
Nevada National Security Site	J1705160	Unmanned aerial system sensors in difficult locations	10/1/2019	9/30/2021		0	518,282	518,282
Nevada National Security Site	J1705169	Phenomenology and node-level processing of sensor data across distributed sensor networks	10/1/2018	9/30/2021		0	670,021	670,021
Nevada National Security Site	J1705179	Imaging of bubble collapse effects in optically transparent high explosive as a method to study the detonation process	10/1/2018	9/30/2020		0	278,960	278,960
Nevada National Security Site	J1705250	Laser induced particle impact test and micro-pin investigation of ejecta / surface interactions	10/1/2019	9/30/2021		0	253,625	253,625
Nevada National Security Site	J1705369	Measurement of second shock ejecta with asymmetric groove shapes and sweeping shock waves	10/1/2018	9/30/2019		0	745	745
Nevada National Security Site	J1705370	Wrap around photonic Doppler velocimetry for measuring the impactor velocity history in high hazard plate impact experiments	10/1/2019	9/30/2020		0	206,516	206,516
Nevada National Security Site	J1705388	Improvised chemical device source term determinations	10/1/2017	9/30/2020		0	304,718	304,718
Nevada National Security Site	J1705397	Drone Video Platform	4/1/2016	9/30/2018		0	828	828
Nevada National Security Site	J1705429	Using coherent anti-Raman Stokes to determine the dynamic temperature of ejecta particles reacting with surrounding gas in a shock compression experiment	10/1/2018	9/30/2021		0	271,051	271,051
Nevada National Security Site	J1705B39	Cognitive hybrid radio waveforms - University Subcontracts	10/1/2018	9/30/2020		0	(750)	(750)
Nevada National Security Site	J1706229	Multi-modal, multi-energy approach for neutron interrogation of spent fuel	10/1/2018	9/30/2021		0	343,376	343,376
Nevada National Security Site	J1706260	Four-Dimensional Aggregate Deconvolution for Aerial Measurements	10/1/2019	9/30/2021		0	212,102	212,102
Nevada National Security Site	J1706B29	Improved topographic and altitude corrections for aerial measurement systems data	10/1/2018	9/30/2020		0	(10,763)	(10,763)
Nevada National Security Site	J170B059	High-fidelity neutron radiography source development	1/9/2019	9/30/2020		0	354,555	354,555
Nevada National Security Site	J170C059	Neutron radiography comparison simulation and modeling	1/9/2019	9/30/2020		0	49,243	49,243
Nevada National Security Site	J170FS29	Feasibility Study - Fielding High-Speed Photonic Doppler Velocimetry at the Omega laser	10/1/2018	9/30/2019		0	49	49

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Nevada National Security Site	J1170FS39	Feasibility Study - Non-Linear Mid-Infrared Detection	11/5/2018	9/30/2019		0	156	156
Nevada National Security Site	J1170FS50	Feasibility Study - Performance monitoring by simultaneously sensing of internal gas exchange and respiration patterns - Pythia	10/1/2019	9/30/2020		0	145,002	145,002
Oak Ridge National Lab	10000	First principles investigation of skyrmion formation in magnetic materials	3/6/2020	3/6/2023	NA	0	134,965	134,965
Oak Ridge National Lab	10002	Artificial Intelligence at the Edge for Scientific Research	1/7/2020	1/7/2023	NA	0	388,961	388,961
Oak Ridge National Lab	10004	Understanding Quantum Materials at the Nanoscale	1/22/2020	1/22/2023	NA	0	150,635	150,635
Oak Ridge National Lab	10007	Development of a computational fluid dynamics code based on new Diffuse Interface and Phase Field models for the direct numerical simulation of Two-Phase flow including Phase Changes	1/22/2020	1/22/2023	NA	0	235,104	235,104
Oak Ridge National Lab	10014	Developing a test platform for compact neutrino detectors for non-proliferation at High Flux Isotope Reactor	6/8/2020	6/8/2023	NA	0	161,682	161,682
Oak Ridge National Lab	10015	Direct photons as probes for new forms of quantum chromodynamic matter	2/7/2020	2/7/2023	NA	0	143,113	143,113
Oak Ridge National Lab	10018	The Search for Emergent Topological Quasiparticles in Condensed Matter	2/7/2020	2/7/2023	NA	0	213,492	213,492
Oak Ridge National Lab	10025	Scanning Transmission Electron Microscope for Atomic-Scale High Frequency Electrochemistry	4/6/2020	4/6/2023	NA	0	100,369	100,369
Oak Ridge National Lab	10045	Measurement of combustion instability of Pre-Chamber Spark Ignition systems using chemiluminescence diagnostics	5/12/2020	5/12/2023	NA	0	12,339	12,339
Oak Ridge National Lab	10061	Marine Engine Digital Twin Large Scale Simulation	5/12/2020	5/12/2023	NA	0	45,702	45,702
Oak Ridge National Lab	10062	Methanol synthesis from carbon dioxide hydrogenation over high-density-atomic copper-based catalysts in a membrane reactor	4/1/2020	4/1/2023	NA	0	191,167	191,167
Oak Ridge National Lab	10067	Liberating Rare Earth Elements from Mineral Captivity: A Molecular Recognition Approach	5/7/2020	5/7/2023	NA	0	162,669	162,669
Oak Ridge National Lab	10074	Computational Systems Biology for Viral Detection and Classification of Emerging Infections and Rapid Identification of Causal Agents and Mechanisms	3/10/2020	3/10/2023	NA	0	48,352	48,352
Oak Ridge National Lab	10076	Macromolecular Architectures and Deuteration: From Nanostructuring to Additive Manufacturing	4/13/2020	4/13/2023	NA	0	189,783	189,783
Oak Ridge National Lab	10080	Stable ionic oligomer membranes capable of learning and memory	6/8/2020	6/8/2023	NA	0	90,573	90,573
Oak Ridge National Lab	10085	Nanobody-based Detection and Therapeutics Against Coronavirus Disease 2019 or Severe acute respiratory syndrome	4/17/2020	4/17/2023	NA	0	178,825	178,825
Oak Ridge National Lab	10088	Tunable Amine Modified Porous Polymer for Carbon Dioxide Capture	6/8/2020	6/8/2023	NA	0	23,100	23,100
Oak Ridge National Lab	10100	Printed, Washable Ceramic Filter Respirator Mask Inserts	4/17/2020	4/17/2023	NA	0	190,644	190,644
Oak Ridge National Lab	10106	Experimental Ranking of Coronavirus Disease 2019 Protease Inhibitors Predicted by Molecular Docking	4/17/2020	4/17/2023	NA	0	170,697	170,697
Oak Ridge National Lab	10122	Tracking Coronavirus Disease 2019 in the absence of testing	4/17/2020	4/17/2023	NA	0	177,520	177,520
Oak Ridge National Lab	10124	Measuring shifts in the Coronavirus Disease 2019 Lung Microbiome/Viriome	4/17/2020	4/17/2023	NA	0	93,125	93,125
Oak Ridge National Lab	10125	Interactions of Coronavirus Disease 2019, Severe acute respiratory syndrome, E-protein and Biomembranes as a Therapeutic Target	4/17/2020	4/17/2023	NA	0	163,976	163,976
Oak Ridge National Lab	10126	Scalable computational biodefense for Coronavirus Disease 2019, and beyond	4/17/2020	4/17/2023	NA	0	189,596	189,596

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Oak Ridge National Lab	10135	Quantum Mechanics in Computational Drug Discovery	4/17/2020	4/17/2023	NA	0	48,856	48,856
Oak Ridge National Lab	10136	Radiation hard batteries for the final frontier	6/8/2020	6/8/2023	NA	0	105,458	105,458
Oak Ridge National Lab	10137	Coronavirus Disease 2019 Intervention Methods	5/12/2020	5/12/2023	NA	0	126,825	126,825
Oak Ridge National Lab	10145	Tailoring Morphology for a New Class of Carbon Fibers	6/30/2020	6/30/2023	NA	0	90,625	90,625
Oak Ridge National Lab	10146	Expanding the High-Level Synthesis Trust Zone	7/16/2020	7/16/2023	NA	0	42,821	42,821
Oak Ridge National Lab	10161	The Large Enriched Germanium Experiment for Neutrinoless Double Project	6/23/2020	6/23/2023	NA	0	91,969	91,969
Oak Ridge National Lab	10163	Bioinspired Growth of Robust Polymers for Enhanced Stability, Activity, and Reusability of Embedded Enzymes: Biological Carbon Dioxide Sequestration with Carbonic Anhydrase	7/16/2020	7/16/2023	NA	0	57,523	57,523
Oak Ridge National Lab	10164	Machine Learning Acceleration using Quantum Computing	7/16/2020	7/16/2023	NA	0	42,245	42,245
Oak Ridge National Lab	10165	Additive Manufacturing of Radiation Detectors using Laser-based Stereolithography Three-Dimensional Printing	7/16/2020	7/16/2023	NA	0	64,307	64,307
Oak Ridge National Lab	8522	Exploring thermal transport in nanostructured materials for thermal energy conversion and management	11/28/2016	11/28/2019	NA	0	3,246	3,246
Oak Ridge National Lab	8686	Computational Imaging for Neutron Bragg-Edge Tomography	2/24/2017	2/24/2020	NA	0	64,971	64,971
Oak Ridge National Lab	8773	Social and Physical Systems in Urban Environments	6/23/2017	6/23/2020	NA	0	85,025	85,025
Oak Ridge National Lab	8794	Pre-Exascale Structural Modeling and Drug Discovery Pipeline	10/26/2017	9/30/2020	NA	0	58,962	58,962
Oak Ridge National Lab	8828	A streamlined strategy for integrated collimator design and sample environment	10/26/2017	9/30/2020	NA	0	68,181	68,181
Oak Ridge National Lab	8832	Microbial Quantitative Trait Locus Mapping	10/26/2017	9/30/2020	NA	0	87,728	87,728
Oak Ridge National Lab	8833	Investigating the slow dynamics of materials using neutron spin Larmor labeling techniques	10/26/2017	9/30/2020	NA	0	69,727	69,727
Oak Ridge National Lab	8858	Obtaining atomistic insights into flexible biomolecular systems by data-driven integration of cryo-electron microscopy, neutron scattering and molecular simulations	10/26/2017	9/30/2020	NA	0	60,827	60,827
Oak Ridge National Lab	8866	A platform to identify and model genetic and phenotypic changes in cancer at the single cell level	10/26/2017	9/30/2020	NA	0	69,595	69,595
Oak Ridge National Lab	8910	Detecting Genome Modifications for Plant Biosecurity	10/26/2017	9/30/2020	NA	0	475	475
Oak Ridge National Lab	8949	Leveraging Computational Structure-Function Analyses to Reveal the Hidden Complexity of Biosystems	10/26/2017	9/30/2020	NA	0	74,865	74,865
Oak Ridge National Lab	8952	Interfacial Thermal Transport: Advanced First Principles Modeling and Ultrafast Thermal Spectroscopy	10/26/2017	9/30/2020	NA	0	73,182	73,182
Oak Ridge National Lab	8988	Hybrid quantum interfaces for dissipationless charge and spin transport	10/26/2017	9/30/2020	NA	0	174,303	174,303
Oak Ridge National Lab	9042	Designing entropy-stabilized oxides and other chemically disordered materials: A stochastic, first principles-finite temperature approach	10/26/2017	9/30/2020	NA	0	71,996	71,996
Oak Ridge National Lab	9207	Predicting Allosteric Drugs for Targeted Cancer Therapy through Computational Docking and Molecular Dynamics	1/30/2018	1/30/2021	NA	0	171,111	171,111
Oak Ridge National Lab	9584	A novel capability to support nuclear model validation and mapping of biases and uncertainties	3/19/2019	3/19/2022	NA	0	106,082	106,082
Oak Ridge National Lab	9612	Butanol as a value-added fuel additive to inhibit microbial degradation of fuels.	2/8/2019	2/8/2022	NA	0	48,853	48,853

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Oak Ridge National Lab	9756	Performant high-order lattice Boltzmann for exascale applications	10/7/2019	9/30/2022	NA	0	401,304	401,304
Oak Ridge National Lab	9774	Elucidation of Hypothetical Protein Function using Machine Learning	10/7/2019	9/30/2022	NA	0	393,995	393,995
Oak Ridge National Lab	9786	Chemical interaction and transport properties in deep eutectic electrolytes for low-temperature energy storage	11/25/2019	11/25/2022	NA	0	161,062	161,062
Oak Ridge National Lab	9791	Exascale graphics processing unit based particle in cell solver	10/7/2019	9/30/2022	NA	0	513,572	513,572
Oak Ridge National Lab	9797	The Halbach Ring, Alliance of Magnetism and Soft-Matter	10/7/2019	9/30/2022		0	529,535	529,535
Oak Ridge National Lab	9798	Investigating Lithium, Manganese Rich All-Solid-State Anode Free Batteries	10/7/2019	9/30/2022		0	925,866	925,866
Oak Ridge National Lab	9808	Bump-in-the-Wire Device Hot-Swapping under Adversarial Conditions	10/4/2019	9/30/2022	NA	0	531,302	531,302
Oak Ridge National Lab	9817	In-situ ultrasound spectroscopy for neutron scattering	10/7/2019	9/30/2022	NA	0	620,474	620,474
Oak Ridge National Lab	9818	Automatic Inference of Firmware Runtime Environments	10/7/2019	9/30/2022	NA	0	692,011	692,011
Oak Ridge National Lab	9820	Process Integrity through Side-Channel Enumeration of States	10/7/2019	9/30/2022	NA	0	856,560	856,560
Oak Ridge National Lab	9822	Federating Scientific Instruments via Software Defined Infrastructure	10/7/2019	9/30/2022	NA	0	664,328	664,328
Oak Ridge National Lab	9823	Novel Environment for Contactless Creep Measurement at High Temperature	10/7/2019	9/30/2022	NA	0	662,153	662,153
Oak Ridge National Lab	9824	Controlling Reversibility in Next-generation Upcycling Polymers	10/7/2019	9/30/2022	NA	0	790,775	790,775
Oak Ridge National Lab	9826	Secure biosystems design of plant and microbiome systems	10/7/2019	9/30/2022	NA	0	1,671,454	1,671,454
Oak Ridge National Lab	9831	Flexible privacy-enabled platform for sensitive applications	10/7/2019	9/30/2022	NA	0	529,695	529,695
Oak Ridge National Lab	9832	Evolution-guided gene functional analysis	10/7/2019	9/30/2022	NA	0	485,562	485,562
Oak Ridge National Lab	9848	Upcycling Waste Thermosets to Performance-Advantaged Polymers	10/7/2019	9/30/2022	NA	0	711,099	711,099
Oak Ridge National Lab	9852	Welding Interfaces for a New Plastics Economy	10/7/2019	9/30/2022	NA	0	509,015	509,015
Oak Ridge National Lab	9854	Radio Frequency-based large-volume fusion-grade neutron source	10/7/2019	9/30/2022	NA	0	480,128	480,128
Oak Ridge National Lab	9858	Automated and high-throughput plant functional genomics	10/7/2019	9/30/2022	NA	0	462,921	462,921
Oak Ridge National Lab	9873	Megabar neutron diffraction on metal-hydride superconductors	10/7/2019	9/30/2022	NA	0	503,987	503,987
Oak Ridge National Lab	9879	A Theory-Based Design Tool for Fusion Reactors	10/7/2019	9/30/2022	NA	0	510,666	510,666
Oak Ridge National Lab	9892	Understanding and predicting radiation-resistant piezoelectric materials	10/7/2019	9/30/2022	NA	0	490,553	490,553
Oak Ridge National Lab	9899	Surpassing Stiffness-Extensibility Trade-off in Elastomers	10/7/2019	9/30/2022	NA	0	342,421	342,421
Oak Ridge National Lab	9924	Artificial Intelligence Initiative	10/7/2019	9/30/2022	NA	0	2,733,481	2,733,481
Oak Ridge National Lab	9925	Distribution Management System Testbed for Power Systems Research and Cyber-vulnerability Evaluation	10/7/2019	9/30/2022	NA	0	519,304	519,304
Oak Ridge National Lab	9933	Development of Temperature-sensitive Paints for Energy Storage Systems and Electric Vehicles	10/17/2019	9/30/2022	NA	0	177,960	177,960
Oak Ridge National Lab	9935	Analysis Framework for Inelastic Neutron-Scattering Spectra	10/7/2019	9/30/2022	NA	0	189,803	189,803
Oak Ridge National Lab	9940	Deconstruction of plastics into useful fuels using single atom catalysts	10/9/2019	9/30/2022	NA	0	171,760	171,760
Oak Ridge National Lab	9954	Scalable Graph Neural Networks for Domain Science	10/22/2019	9/30/2022	NA	0	92,451	92,451

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Oak Ridge National Lab	9955	Sparse optimization techniques for sensor placement and parameter learning	10/21/2019	9/30/2022	NA	0	319,644	319,644
Oak Ridge National Lab	9958	Geochemical regulation of ecosystem carbon storage	10/4/2019	9/30/2022	NA	0	568,285	568,285
Oak Ridge National Lab	9960	Whole Environment Asynchronous Virtual Bus Ledger Ecosystem	1/28/2020	1/28/2023	NA	0	56,581	56,581
Oak Ridge National Lab	9963	Automated Intelligent Generative Design for Scientific and Engineering Applications - Heat Exchanger	1/7/2020	1/7/2023	NA	0	138,058	138,058
Oak Ridge National Lab	9969	Tomato Power: Generation of electricity from biogenic volatile organic compounds emitted by indoor cultivation facilities	4/6/2020	4/6/2023	NA	0	44,269	44,269
Oak Ridge National Lab	9972	Detection of Nephrons in Low Field Renal Magnetic Resonance Imaging Leveraging Deep Learning Model-Based Iterative Reconstruction	11/25/2019	11/25/2022	NA	0	189,994	189,994
Oak Ridge National Lab	9976	Human-Microbial Induced Metabolic Dynamics	3/6/2020	3/6/2023	NA	0	194,595	194,595
Oak Ridge National Lab	9977	Design Fundamentals of Cracking Resistant Graded Materials for Nuclear Reactor Application	12/2/2019	12/2/2022	NA	0	164,841	164,841
Oak Ridge National Lab	9983	Understanding Topological Superconductors for Quantum Information Science Applications Through the Lens of the Electronic Structure	11/25/2019	11/28/2022	NA	0	318,997	318,997
Oak Ridge National Lab	9984	Scalable Bayesian uncertainty quantification for neural networks	12/4/2019	12/4/2022	NA	0	276,092	276,092
Oak Ridge National Lab	9985	Safe Hydrogen Extraction via Hydrophobic-Sieving Bifunctional Membranes	1/7/2020	1/7/2023	NA	0	99,851	99,851
Oak Ridge National Lab	9995	Multiscale Computational Methodologies for Materials Properties/Processes	12/16/2019	12/16/2022	NA	0	157,909	157,909
Oak Ridge National Lab	ORNL19-9340	Advanced Dynamic Design of Catalytic Polymers Aided by Neutron Scattering	10/2/2018	9/30/2021	NA	0	453,851	453,851
Oak Ridge National Lab	ORNL19-9350	Distributed Agent-Based Modeling for Sensor-Limited Data in Materials	10/11/2018	9/30/2021	NA	0	369,359	369,359
Oak Ridge National Lab	ORNL19-9361	Next Generation Radiotherapeutics and Bioassessment Platforms	10/23/2018	9/30/2021	NA	0	557,808	557,808
Oak Ridge National Lab	ORNL19-9369	Chemical Kinetic Model Construction for Reacting Flow Simulations using Massively Parallel Computing	10/9/2018	9/30/2021	NA	0	450,686	450,686
Oak Ridge National Lab	ORNL19-9370	Novel Wide Bandgap Gallium Oxide Based Power Electronic Devices	10/10/2018	9/30/2021	NA	0	338,033	338,033
Oak Ridge National Lab	ORNL19-9371	Guided Whole Cell Printing of Bio-Derived Composites	10/9/2018	9/30/2021	NA	0	412,362	412,362
Oak Ridge National Lab	ORNL19-9374	A robust and computationally efficient algorithm for fast time-to-solution Density Functional Theory calculations on Graphics Processing Unit-based parallel computers	10/9/2018	9/30/2021	NA	0	394,909	394,909
Oak Ridge National Lab	ORNL19-9376	Development and Demonstration of a Real-Time Mobility Control and Visualization System for Connected and Automated Vehicles	10/10/2018	9/30/2021	NA	0	249,921	249,921
Oak Ridge National Lab	ORNL19-9383	A Connected Vehicle Research Environment to Decrease Energy Use and Emissions through Scalable Cooperative Control Mechanisms	10/10/2018	9/30/2021	NA	0	373,038	373,038
Oak Ridge National Lab	ORNL19-9401	Synthesis During Flow--An Enabling Approach toward Challenging Molecules	10/11/2018	9/30/2021	NA	0	339,666	339,666
Oak Ridge National Lab	ORNL19-9410	Probing quantum entanglement using neutron scattering and magnetic Wollaston prisms.	10/9/2018	9/30/2021	NA	0	338,298	338,298
Oak Ridge National Lab	ORNL19-9412	Intelligent Streaming Data and Event Analysis for Sensors	10/11/2018	9/30/2021	NA	0	500,121	500,121
Oak Ridge National Lab	ORNL19-9415	New Paradigms for Understanding Ionic Transport in Polymer Electrolytes	10/23/2018	9/30/2021	NA	0	348,798	348,798

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Oak Ridge National Lab	ORNL19-9427	Rational clustered, regularly interspaced, short palindromic repeats design for ecological engineering of microbiomes	10/9/2018	9/30/2021	NA	0	454,409	454,409
Oak Ridge National Lab	ORNL19-9436	Establishing the High Flux Isotope Reactor as a unique nuclear data measurement facility	10/23/2018	9/30/2021	NA	0	516,160	516,160
Oak Ridge National Lab	ORNL19-9438	Designing polymers with excessive free volume for enhanced molecular and ion transport	10/10/2018	9/30/2021	NA	0	387,010	387,010
Oak Ridge National Lab	ORNL19-9442	Establishing a cross-kingdom gene regulation capability to enhance fungal nutrient uptake	10/11/2018	9/30/2021	NA	0	401,098	401,098
Oak Ridge National Lab	ORNL19-9445	Rapid Detection and Classification of Global Positioning System Interference	10/11/2018	9/30/2021	NA	0	290,983	290,983
Oak Ridge National Lab	ORNL19-9458	Molecular Understanding of Soft Matter Flow and Deformation with Neutrons	10/23/2018	9/30/2021	NA	0	308,682	308,682
Oak Ridge National Lab	ORNL19-9463	A Scalable Math Library for Efficient Higher-Dimensional Hierarchical Tensor Representations and Simulations at Exascale	10/2/2018	9/30/2021	NA	0	434,798	434,798
Oak Ridge National Lab	ORNL19-9478	Scalable Coarse Mesh computational fluid dynamics Solver for Large Scale Nuclear System Simulations	10/23/2018	9/30/2021	NA	0	331,032	331,032
Oak Ridge National Lab	ORNL19-9479	Cross-kingdom mapping and functional validation of life's essential protein motifs	10/11/2018	9/30/2021	NA	0	244,808	244,808
Oak Ridge National Lab	ORNL19-9488	Data-driven Biomass Prediction Models from Multispectral Images of Nitrogen-Stressed Plants	10/23/2018	9/30/2021	NA	0	379,821	379,821
Oak Ridge National Lab	ORNL19-9494	A Semantic Graph Approach to Monitoring the Biological Literature for Biosecurity Applications	10/9/2018	9/30/2021	NA	0	387,425	387,425
Oak Ridge National Lab	ORNL19-9498	From can't to CAN: Attack prevention & in-situ detection of advanced attacks on controller area networks	10/19/2018	9/30/2021	NA	0	419,635	419,635
Oak Ridge National Lab	ORNL19-9502	Development of a Land Model Testbed for Rapid Assessment and Benchmarking of Multiscale Complex Biogeochemistry in Earth System Models	10/12/2018	9/30/2021	NA	0	376,943	376,943
Oak Ridge National Lab	ORNL19-9505	Integrated Wireless Charging and Grid Interface Energy Storage Platform	10/12/2018	9/30/2021	NA	0	336,561	336,561
Oak Ridge National Lab	ORNL19-9507	An Advanced Waveguide for Spatially Distributed Monitoring of In-Core Temperatures Based on Ultrasonic Guided Waves	10/23/2018	9/30/2021	NA	0	508,125	508,125
Oak Ridge National Lab	ORNL19-9509	Ammonia synthesis over Two-Dimensional electrified-based catalysts at ambient pressure and low temperature	10/19/2018	9/30/2021	NA	0	408,075	408,075
Oak Ridge National Lab	ORNL19-9511	Implementation and Development of an Electric and Magnetic Field Diagnostic for Direct Validation of Magnetic Fusion Energy Physics and Exascale Computational Models	10/3/2018	9/30/2021	NA	0	483,433	483,433
Oak Ridge National Lab	ORNL19-9515	Three-Dimensional-Printing Shape Memory Ceramics for Complex Casting Applications	10/9/2018	9/30/2021	NA	0	258,725	258,725
Oak Ridge National Lab	ORNL19-9533	Accelerating Discovery, Synthesis, and Control of Topological Quantum Materials	10/31/2018	9/30/2021	NA	0	490,102	490,102
Oak Ridge National Lab	ORNL19-9538	Multi-port solid-state transfer to enable extreme fast charging	10/19/2018	9/30/2021	NA	0	418,478	418,478
Oak Ridge National Lab	ORNL19-9541	Machine Learning Based Multi-Physics Nuclear Reactor Core Simulations of Molten Salt Reactors	10/10/2018	9/30/2021	NA	0	387,691	387,691
Oak Ridge National Lab	ORNL19-9546	Semi-Automated Discovery of a Digital Twin of a Programmed Logic Controller	10/19/2018	9/30/2021	NA	0	415,339	415,339
Oak Ridge National Lab	ORNL19-9555	Bridging the Gap: Modern Computational Design & Vapor Synthesis of Ultra High Temperature Structural Ceramics for Energy, Transportation & Defense	10/31/2018	9/30/2021	NA	0	1,001,321	1,001,321

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Oak Ridge National Lab	ORNL19-9573	Developing Red Team Capabilities for Challenging Machine Learning-Based Defenses for Cyber-Physical Systems	10/3/2018	9/30/2021	NA	0	689,839	689,839
Oak Ridge National Lab	ORNL19-9574	Application of Digital Twin Techniques to Operational Assets	10/2/2018	9/30/2021	NA	0	485,539	485,539
Oak Ridge National Lab	ORNL19-9613	Artificial Intelligence Initiative to develop a research capability in artificial intelligence and machine learning and apply this capability to science and engineering challenges. Research will focus on areas that distinguish the laboratory mission space from that of either industry or academia and will be demonstrated in two application areas, including biosciences and additive manufacturing.	10/9/2018	9/30/2021	NA	0	62,039	62,039
Oak Ridge National Lab	ORNL19-9614	Use existing metabolite-gene association networks in black cottonwood (<i>Populus trichocarpa</i>) as a foundation to rapidly link genotype and phenotype at the molecular level, and thereby discover novel enzymes and biochemical pathways that are relevant to biofuels, materials science, and plant secondary metabolism	10/19/2018	9/30/2021	NA	0	208,533	208,533
Oak Ridge National Lab	ORNL19-9618	Accuracy and Stability Enhancing Techniques for Non-Linear Evolution Equations	5/10/2019	5/10/2022	NA	0	199,766	199,766
Oak Ridge National Lab	ORNL19-9646	A new paradigm in sensing: A quantum enabled standoff chemical and biological sensor	12/14/2018	12/14/2021	NA	0	75,994	75,994
Oak Ridge National Lab	ORNL19-9687	Development of Whole Core Simulation Capability for Pebble Bed Reactors	2/8/2019	2/8/2022	NA	0	56,813	56,813
Oak Ridge National Lab	ORNL19-9691	Learning the meaning of code to assist the human analyst in finding software vulnerabilities	1/18/2019	1/18/2022	NA	0	298,515	298,515
Oak Ridge National Lab	ORNL19-9693	Measurement of Neptunium-238 capture/fission cross section and fission yields in the High Flux Isotope Reactor	6/6/2019	6/6/2022	NA	0	72,379	72,379
Oak Ridge National Lab	ORNL19-9697	Advanced Genetic Techniques to Identify Radiotherapy and Chemical Responses	11/2/2018	11/2/2021	NA	0	213,374	213,374
Oak Ridge National Lab	ORNL19-9706	Topological quantum materials: from exactly solvable models to quantum computing	1/22/2019	1/22/2022	NA	0	326,916	326,916
Oak Ridge National Lab	ORNL19-9716	New class of (semi)fluorinated proton-conducting polymers with superior properties for proton exchange membrane fuel cells.	5/10/2019	5/10/2022	NA	0	161,842	161,842
Oak Ridge National Lab	ORNL19-9717	Creating Digital Discipline in Advanced Manufacturing	2/21/2019	2/21/2022	NA	0	786,734	786,734
Oak Ridge National Lab	ORNL19-9718	High Precision Machining of Additively Manufactured Components	2/21/2019	2/21/2022	NA	0	617,575	617,575
Oak Ridge National Lab	ORNL19-9721	Collaborative Operational Control for Complex Systems with Minimized Uncertainties Impact	2/21/2019	2/21/2022	NA	0	607,121	607,121
Oak Ridge National Lab	ORNL19-9722	Solid State Lithium Batteries by Roll-to-roll	5/23/2019	5/23/2022	NA	0	915,362	915,362
Oak Ridge National Lab	ORNL19-9723	Material identification using multi-particle radiography	3/19/2019	7/24/2022	NA	0	183,892	183,892
Oak Ridge National Lab	ORNL19-9725	Refraction-Based Building Air Leakage Detector	6/6/2019	6/6/2020	NA	0	111,690	111,690
Oak Ridge National Lab	ORNL19-9730	Enabling Topological Quantum Information Processing by Interfacing Quantum Materials and Quantum Computing	6/6/2019	6/6/2022	NA	0	1,356,487	1,356,487
Oak Ridge National Lab	ORNL19-9747	The Scientific and Technical Feasibility of Helium Cooled Fusion Blanket First Walls	4/23/2019	4/23/2022	NA	0	361,319	361,319
Oak Ridge National Lab	ORNL19-9782	Efficient Process-Intensification Approach for Carbon Dioxide Absorption using Amino-Acid Solutions with a Guanidine Compound	6/6/2019	6/6/2022	NA	0	146,506	146,506

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Oak Ridge National Lab	ORNL19-9906	Building High-Performance Scalable Geocomputation Capabilities for Global and High-Resolution Geospatial Studies	5/29/2019	5/29/2022	NA	0	389,140	389,140
Oak Ridge National Lab	ORNL19-9910	Enhancing drug discovery via prediction of hot spots	6/6/2019	6/6/2022	NA	0	141,560	141,560
Oak Ridge National Lab	ORNL19-9912	Creating a Realistic Model Fish Surrogate for Use in Hydropower Turbine Blade Strike Studies	6/6/2019	6/6/2022	NA	0	59,639	59,639
Oak Ridge National Lab	ORNL19-9916	Wave Physics-Integrated Machine-Learning Algorithms for Acoustic Source Characterization in Diagnostics and Prognostics	5/29/2019	5/29/2022	NA	0	360,070	360,070
Oak Ridge National Lab	ORNL19-9922	Using fundamental physicochemical descriptors to enable high-throughput screening of nanostructured materials for new energy solutions	7/23/2019	7/23/2022	NA	0	124,281	124,281
Oak Ridge National Lab	ORNL19-9928	Vapor Synthesis of Advanced Nitride-Based Ultra-High Temperature Ceramics for Extreme Operating Environments	7/23/2019	7/23/2022	NA	0	503,026	503,026
Pacific Northwest National L	PN17072/2962	PICO-40L (40 Liter Version of the) Bubble Chamber Research and Development	1/20/2017	1/19/2020		0	95,164	95,164
Pacific Northwest National L	PN17101/2991	Determining Radiolytic Transient Intermediates and Interfacial Species and Their Roles in Aluminum Oxyhydroxide Reactivity	7/17/2017	7/16/2020	N/A	0	112,214	112,214
Pacific Northwest National L	PN17102/2992	Dissolution of Spent Nuclear Fuel: An In situ and Atomic Resolution Transmission Electron Microscopy Study	10/1/2017	9/30/2020	N/A	0	124,174	124,174
Pacific Northwest National L	PN17105/2995	Patterns and Mechanisms of Coastal Forest Loss in Relation to Sea-level Variability, Drought, and Heat-waves	8/8/2017	8/7/2020	N/A	0	199,933	199,933
Pacific Northwest National L	PN17106/2996	Process-based Understanding of Perturbation Impacts in Tidally-influenced Nearshore Terrestrial-aquatic Interfaces	8/8/2017	8/7/2020	N/A	0	152,546	152,546
Pacific Northwest National L	PN17107/2997	Understanding How Saltwater Intrusion Interacts with Plant Communities to Affect Soil Greenhouse Gas Fluxes in Coastal Forests	8/8/2017	8/7/2020	N/A	0	158,030	158,030
Pacific Northwest National L	PN17109/2999	Characterization of Radiation Induced Defects Across Scales	8/18/2017	8/17/2020	N/A	0	103,877	103,877
Pacific Northwest National L	PN18001/3000	From Crystalline Nanorods to Hierarchical Structures	10/1/2017	9/30/2020	N/A	0	253,703	253,703
Pacific Northwest National L	PN18002/3001	Topographic, Chemical, and Structural Nanoscopy of Biomineral Nucleation and Phase Transformation	10/1/2017	9/30/2020	N/A	0	69,642	69,642
Pacific Northwest National L	PN18003/3002	Actinide Fluorination Science	10/1/2017	9/30/2020	N/A	0	6,076	6,076
Pacific Northwest National L	PN18004/3003	Visible and Ultraviolet -Light Mediated Photochemistry of the Actinides: Photocatalysis and Luminescence Detection	10/1/2017	9/30/2020	N/A	0	291,108	291,108
Pacific Northwest National L	PN18011/3010	The Physics of Ultralight Particles	10/2/2017	9/30/2020		0	300,164	300,164
Pacific Northwest National L	PN18013/3012	Building a Virtual Plant Ecosystem	10/3/2017	9/30/2020		0	410	410
Pacific Northwest National L	PN18026/3025	Damage Mechanisms and Defect Formation in Irradiated Model Systems	10/25/2017	9/30/2020		0	130,519	130,519
Pacific Northwest National L	PN18031/3030	Hydrologic Imprinting Across Terrestrial-aquatic Gradients: Unraveling the Spectrum of Ecosystem Responses to Freshwater Limitation	11/13/2017	9/30/2020		0	224,212	224,212
Pacific Northwest National L	PN18045/3044	Gaining New Insights into the Drought Impacts at Finer Scales by Developing a High-spatiotemporal-resolution Solar Induced Chlorophyll Fluorescence Dataset	1/3/2018	9/30/2020		0	44,889	44,889
Pacific Northwest National L	PN18047/3046	Redesigning a Small Laccase into a Robust Catalyst for Oxygen Reduction Reaction on Electrode Surface	1/5/2018	9/30/2020		0	214,945	214,945
Pacific Northwest National L	PN18053/3052	Chemical Modeling of the Fate of Radioiodine	2/6/2018	2/5/2021	N/A	0	126,646	126,646
Pacific Northwest National L	PN18054/3053	Interpretation of Trained Recurrent Neural Nets by State-Space Reconstruction	2/6/2018	2/5/2021	N/A	0	157,129	157,129

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Pacific Northwest National L	PN18055/3054	Performance Prediction and Process Attribution for Additive Manufacturing	2/6/2018	2/5/2021	N/A	0	129,599	129,599
Pacific Northwest National L	PN18058/3057	Integration Infrastructure and Toolsets	2/12/2018	2/11/2021	N/A	0	163,863	163,863
Pacific Northwest National L	PN18060/3059	Controlled Mineral Growth for Improving Technetium-99 and Iodine-129 Retention in Cementitious Waste Forms	2/16/2018	2/15/2021	N/A	0	161,861	161,861
Pacific Northwest National L	PN18066/3065	Atomic and Sub-nanoscale Engineered Multifunctional Electrocatalysts	3/27/2018	3/26/2021		0	151,858	151,858
Pacific Northwest National L	PN18070/3069	Collective Atomic Phenomena for Separations Science	4/2/2018	4/1/2021		0	14,906	14,906
Pacific Northwest National L	PN18074/3073	Investigation of Quantum Information System Algorithms and Software Framework for Electronic Structure Calculations	5/3/2018	5/2/2021		0	2,115	2,115
Pacific Northwest National L	PN18082/3081	New Quantum Phenomena by Combining Two-dimensional Materials with Complex Oxides	5/31/2018	5/30/2021		0	75,280	75,280
Pacific Northwest National L	PN18085/3084	Cyber-based Contingency Analysis of Interdependent Infrastructure Networks under Uncertainty	10/1/2018	9/30/2021		0	238,778	238,778
Pacific Northwest National L	PN18087/3086	Imaging Intact Filamentous Fungi from Spore to Hyphal Tip on the Nanoscale	7/31/2018	7/30/2021		0	1,261,663	1,261,663
Pacific Northwest National L	PN18088/3087	MineCraft: Deep Data Analytic Capability to Detect, Monitor, and Counter Proliferation Activities	10/1/2018	9/30/2021		0	6,311	6,311
Pacific Northwest National L	PN18089/3088	Characterizing Operations of Reactors in Data	10/1/2018	9/30/2021		0	239,207	239,207
Pacific Northwest National L	PN18090/3089	Protecting Research - Classified Project	8/29/2018	8/28/2021		0	13,700	13,700
Pacific Northwest National L	PN19003/3092	Design of Clean, High Rate, and Long Cycling Dual-Ion Batteries for Large Scale Energy Storage Applications	10/1/2018	9/30/2021		0	212,573	212,573
Pacific Northwest National L	PN19004/3093	Understanding the Dynamic Riparian Redox Environment through Novel Field and Laboratory Tools	10/1/2018	9/30/2021		0	273,168	273,168
Pacific Northwest National L	PN19005/3094	Artificial Photosynthesis with Next Generation Molecular Catalysts	10/1/2018	9/30/2021		0	139,306	139,306
Pacific Northwest National L	PN19006/3095	A Critical Gap in our Ability to Quantify and Model Earth System Interactions—Development of a Global, Mechanistic Understanding of Methane Emissions from Trees	10/1/2018	9/30/2021		0	149,401	149,401
Pacific Northwest National L	PN19008/3097	Improving Ductility of Hydride Embrittled Zirconium	10/1/2018	9/30/2021		0	101,639	101,639
Pacific Northwest National L	PN19009/3098	Betavoltaics from Commercial Off-The-Shelf: Power for Years	10/1/2018	9/30/2021		0	136,829	136,829
Pacific Northwest National L	PN19010/3099	Incorporation of Multifunctionality in Electrodes for Electrocatalytic Rate Enhancement	10/1/2018	9/30/2021		0	149,847	149,847
Pacific Northwest National L	PN19011/3100	De Novo Design of Molecular Recognition for Sequence Defined Polymers	10/1/2018	9/30/2021		0	133,607	133,607
Pacific Northwest National L	PN19012/3101	Ambient Ion Confinement and Manipulation to Enable High Throughput Structurally Selective Material Deposition	10/1/2018	9/30/2021		0	159,067	159,067
Pacific Northwest National L	PN19013/3102	Probing the Mechanism of Carbon Dioxide Hydrogenation Over Cobalt and Iron Single Nanoparticles	10/1/2018	9/30/2021		0	255,311	255,311
Pacific Northwest National L	PN19014/3103	Developing a Simulator-based Satellite Dataset for Using Machine Learning Techniques to Derive Aerosol-cloud-precipitation Interactions in Models and Observations in a Consistent Framework	10/1/2018	9/30/2021		0	71,507	71,507
Pacific Northwest National L	PN19015/3104	Development and Validation of New Fundamental Physics Detector Materials	10/1/2018	9/30/2021		0	189,701	189,701
Pacific Northwest National L	PN19016/3105	Advancement of the Molecular Microscope to Enable High-resolution Dynamic Imaging and Unprecedented Spatial Metabolomic Information of Living Systems	10/1/2018	9/30/2021		0	128,856	128,856

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Pacific Northwest National L	PN19019/3108	Electrocatalytic Routes Towards Reductive Chemical Transformations	10/1/2018	9/30/2021		0	310,231	310,231
Pacific Northwest National L	PN19021/3110	Mapping Nutrient Flow through a Plant-Microbe Symbiont System using Stable Isotope Probing under Drought and Salinity Stress	10/1/2018	9/30/2021		0	150,270	150,270
Pacific Northwest National L	PN19022/3111	Noble Liquids	10/1/2018	9/30/2021		0	223,590	223,590
Pacific Northwest National L	PN19023/3112	Multiscale Modeling of Complex Metabolic and Regulatory Networks: from Molecules to Cells	10/1/2018	9/30/2021		0	184,461	184,461
Pacific Northwest National L	PN19024/3113	Correlated Multimodal In-situ Gas-Metal Alloy Surface Reaction Studies	10/1/2018	9/30/2021		0	140,621	140,621
Pacific Northwest National L	PN19027/3116	Detecting and Predicting Risk from Unknown Biological Threats through Open-source Data Fusion	10/10/2018	9/30/2021		0	269,795	269,795
Pacific Northwest National L	PN19028/3117	Dynamics of Quantum-Influenced Material Properties	10/15/2018	9/30/2021		0	188,129	188,129
Pacific Northwest National L	PN19029/3118	Response of Functional Materials to Changing Thermo-Chemical Environments	10/16/2018	9/30/2021		0	106,685	106,685
Pacific Northwest National L	PN19036/3125	Uncertainty Quantification for Complex Systems	10/22/2018	9/30/2021		0	164,857	164,857
Pacific Northwest National L	PN19038/3127	Experimental Studies of the Dynamics of Adsorbed Iodine Species Formed in Severe Reactor Accidents	10/23/2018	9/30/2021		0	226,335	226,335
Pacific Northwest National L	PN19039/3128	Physics Informed Deep Learning Models for Data Driven Prediction and Discovery	10/23/2018	9/30/2021		0	156,271	156,271
Pacific Northwest National L	PN19040/3129	Synthesis and Isolation of Functional Materials	10/23/2018	9/30/2021		0	342,468	342,468
Pacific Northwest National L	PN19043/3132	The Storage of Marine Hydrokinetic Power through Hydrogen Production and Carbon Extraction	10/29/2018	12/1/2019		0	(156)	(156)
Pacific Northwest National L	PN19045/3134	Radiotracer Atmospheric Dynamics Chamber	11/5/2018	9/30/2021		0	316,838	316,838
Pacific Northwest National L	PN19046/3135	Chemistry Molten Salt Reactors: Mastering Molten Salt Chemistry for Energy and National Security	11/6/2018	9/30/2021		0	1,910,172	1,910,172
Pacific Northwest National L	PN19049/3138	Liquid: Extraction Characterization	11/13/2018	9/30/2021		0	114,009	114,009
Pacific Northwest National L	PN19050/3139	Non-Radioactive Signatures of Material Samples	11/15/2018	9/30/2020		0	(346)	(346)
Pacific Northwest National L	PN19051/3140	Particle Size and Density Measurement	11/26/2018	9/30/2021		0	20,126	20,126
Pacific Northwest National L	PN19057/3146	Investigation of Interactions between Iodine and Adsorbent Material	12/3/2018	9/30/2021		0	131,462	131,462
Pacific Northwest National L	PN19059/3148	Cosmetic Microbeads and Silver Nanoparticles in Wastewater, Biosolids, and Soil	12/10/2018	9/30/2021		0	37,158	37,158
Pacific Northwest National L	PN19061/3150	Future Response of Coastal Wetlands to Environmental Stresses: Algorithm Comparison of Numerical Models	12/10/2018	9/30/2021		0	95,578	95,578
Pacific Northwest National L	PN19064/3153	Understanding Fluid Flow at Nanoscale Interfaces	12/11/2018	9/30/2021		0	144,290	144,290
Pacific Northwest National L	PN19067/3156	Ion and Charge Transfer Across Complex Interfaces	12/18/2018	9/30/2021		0	147,839	147,839
Pacific Northwest National L	PN19068/3157	Technology Acceleration and Rapid Deployment for Innovative Solutions	12/19/2018	9/30/2021		0	294,389	294,389
Pacific Northwest National L	PN19070/3159	Mechanistic Modeling of Soil Biogeochemical Processes in Response to Redox Fluctuations	12/20/2018	9/30/2021		0	146,658	146,658
Pacific Northwest National L	PN19071/3160	Quantum Algorithms, Software, and Architectures	12/21/2018	9/30/2021		0	1,133,994	1,133,994
Pacific Northwest National L	PN19072/3161	Scalable Engineered Chalcogenide Quantum Materials	1/2/2019	1/1/2022		0	140,907	140,907
Pacific Northwest National L	PN19073/3162	Exploring the Role of Severe Shear in Bulk Solid Phase Processing Systems	1/10/2019	1/9/2022		0	352,908	352,908
Pacific Northwest National L	PN19074/3163	Advanced Beamline Studies of Microstructural Evolution under Shear Deformation	1/14/2019	1/13/2022		0	450,451	450,451
Pacific Northwest National L	PN19075/3164	Multiscale Tribometric Shear Deformation	1/16/2019	1/15/2022		0	308,812	308,812
Pacific Northwest National L	PN19076/3165	Discovering Solid Phase Processing Thermomechanical Pathways	1/16/2019	1/15/2022		0	351,580	351,580
Pacific Northwest National L	PN19077/3166	Characterization of Carbonaceous Surface Deposits on Irradiated Iron Aluminide (FeAl3) Coatings	1/18/2019	1/17/2022		0	148,530	148,530
Pacific Northwest National L	PN19079/3168	Phase Field + Crystal Plasticity Simulation of High Shear Events with Metastable Phases	3/5/2019	3/4/2022		0	174,996	174,996

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Pacific Northwest National L	PN19080/3169	Exploration of Domain Aware Machine Learning for Grid Analytics	3/20/2019	3/19/2022		0	133,494	133,494
Pacific Northwest National L	PN19081/3170	Software Defined Architectures for Data Analytics	3/22/2019	3/21/2022		0	395,205	395,205
Pacific Northwest National L	PN19082/3171	Hybrid Advanced Workflows	3/22/2019	3/21/2022		0	392,539	392,539
Pacific Northwest National L	PN19084/3173	Agile Research and Technology Transitions	4/1/2019	3/31/2022		0	55,596	55,596
Pacific Northwest National L	PN19088/3177	Tagging a Smaller Size Class of Fish: Can it be Done?	4/9/2019	4/8/2022		0	15,042	15,042
Pacific Northwest National L	PN19091/3180	Enabling Technology for Isotope Separation Methods	5/13/2019	5/12/2022		0	236,855	236,855
Pacific Northwest National L	PN19092/3181	Understanding the Electrical Double Layer Structure and Electron	9/1/2019	8/31/2022		0	247,991	247,991
Pacific Northwest National L	PN19093/3182	Deep Electrification Analysis	5/13/2019	5/12/2022		0	115,775	115,775
Pacific Northwest National L	PN19096/3185	Pacific Northwest Supply Chain Model for Selected Bioproducts	5/14/2019	5/13/2022		0	(5,968)	(5,968)
Pacific Northwest National L	PN19097/3186	Elucidation of the Reaction Mechanisms of Autooxidative Processes in Complex Condensed-Phase Mixtures	6/3/2019	6/2/2022		0	183,567	183,567
Pacific Northwest National L	PN19098/3187	Manufacturing Dissolvable Alloy Components using Shear Assisted Processing and Extrusion	6/11/2019	6/10/2022		0	56,347	56,347
Pacific Northwest National L	PN19099/3188	Advancing Discoveries in Physical and Computational Sciences	6/11/2019	6/10/2022		0	40,879	40,879
Pacific Northwest National L	PN19101/3190	Process-Structure-Property-Performance of Friction-Deformation Processing: Sparse Data Machine Learning Integration with Theory, Experiment and Uncertainty Quantification	6/17/2019	6/16/2022		0	94,780	94,780
Pacific Northwest National L	PN19102/3191	Storm Surge Effects on Upland Forests as a Regulated by the Ecosystem Pore Space Continuum	6/21/2019	6/20/2022		0	419,094	419,094
Pacific Northwest National L	PN19103/3192	Multimodal Instrument Platform for High-Pressure Magic Angle Spinning-Nuclear Magnetic Resonance and Infrared Spectroscopic Integration	6/26/2019	6/25/2022		0	53,119	53,119
Pacific Northwest National L	PN19104/3193	GridSandbox: End-to-End Analytics for Grid Architectural Design and All-Hazard Assessment	7/1/2019	6/30/2022		0	181,886	181,886
Pacific Northwest National L	PN19105/3194	Microfluidics for Characterizing and Optimizing the Production of Rhizosphere Metabolites	7/18/2019	7/17/2022		0	213,458	213,458
Pacific Northwest National L	PN19106/3195	Optimizing Sub-Sampled Science, Technology, Engineering, and Math Imaging for Beam Sensitive Materials and Dynamic Processes	7/18/2019	7/17/2022		0	86,526	86,526
Pacific Northwest National L	PN19107/3196	Land Use Change, Atmospheric Composition, and Clouds: An Application of Deep Learning Surrogate Models	8/6/2019	8/5/2022		0	226,885	226,885
Pacific Northwest National L	PN19108/3197	Computation-Flow-Architecture: Designing Non-Von-Neumann Architecture for Future Data-Centric Computing	8/6/2019	8/5/2022		0	162,900	162,900
Pacific Northwest National L	PN19109/3198	Holonic Approach Towards Data Model Convergence	8/9/2019	8/8/2022		0	196,437	196,437
Pacific Northwest National L	PN19110/3199	Application-Algorithm-Architecture Co-Design for Large-Scale, Sparse Tensor/Matrix Methods	8/9/2019	8/8/2022		0	146,574	146,574
Pacific Northwest National L	PN19111/3200	Segmented Global Address Space: A Memory-Centric Programming Model and Runtime	8/9/2019	8/8/2022		0	105,126	105,126
Pacific Northwest National L	PN19112/3201	Fallacy Fixing Amdahl's Law within the Limits of Accelerated Systems	8/15/2019	8/14/2022		0	166,570	166,570
Pacific Northwest National L	PN19113/3202	Theory-Driven Reinforcement Learning: Understanding Complexity in Protein Dynamics	8/15/2019	8/14/2022		0	161,129	161,129
Pacific Northwest National L	PN19114/3203	Laboratory-based X-ray Absorption Spectroscopy for In-situ Characterization of Catalytic Materials	8/15/2019	8/14/2022		0	95,658	95,658
Pacific Northwest National L	PN19115/3204	Causal Inference and Machine Learning Methods for Analysis of Security Constraints in Security Constrained Unit Commitment	8/16/2019	8/15/2022		0	204,320	204,320
Pacific Northwest National L	PN19116/3205	Mass Selective Axial Ion Ejection for Improved Tandem Mass Spectrometry	8/27/2019	8/26/2022		0	101	101

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Pacific Northwest National L	PN20001/3228	Interdisciplinary Efforts Relevant to Department of Energy Biological Missions	2/6/2018	2/5/2021	NA	0	156,056	156,056
Pacific Northwest National L	PN20002/3229	Biomedical Resilience And Readiness in Adverse Operating Environments	12/10/2018	9/30/2021		0	1,003,255	1,003,255
Pacific Northwest National L	PN20004/3231	Physics-based Multiscale Modelling and Rapid Prototyping for Redox Flow Battery	10/1/2019	9/30/2022		0	146,400	146,400
Pacific Northwest National L	PN20005/3232	Staff Driven Selection of Innovative Ideas Relevant to Department of Energy Missions	10/1/2019	9/30/2022		0	315,464	315,464
Pacific Northwest National L	PN20006/3233	A Compiler Infrastructure for Data Model Convergence	10/1/2019	9/30/2022		0	208,549	208,549
Pacific Northwest National L	PN20007/3234	Mesoscale Phase-field Modeling of Chemical and Microstructural Evolution Dynamics during Materials Manufacture	10/1/2019	9/30/2022		0	55,002	55,002
Pacific Northwest National L	PN20008/3235	The Realities of Signal Combining Multiple Axion Haloscopes	10/1/2019	9/30/2022		0	164,299	164,299
Pacific Northwest National L	PN20009/3236	Continuum Scale Computational Modeling to Predict Thermomechanical Behavior of Material During Solid Phase Processing	10/1/2019	9/30/2022		0	143,630	143,630
Pacific Northwest National L	PN20010/3237	Feedstock-Structure-Property Relationships in the Additive Manufacturing of High-Performance Thermoplastics	10/1/2019	9/30/2022		0	202,585	202,585
Pacific Northwest National L	PN20011/3238	Co-hydrocrack Mixed Plastic Waste and Vacuum Gas Oil	10/1/2019	9/30/2022		0	27,141	27,141
Pacific Northwest National L	PN20012/3239	Environmental Effects and Offsite Dose – Tristructural-isotropic Fuel Release Consequence Analysis	10/1/2019	9/30/2022		0	97,488	97,488
Pacific Northwest National L	PN20013/3240	Peer-to-peer Communication Control Architecture for Engaging Ubiquitous Distributed Energy Resources to Support Distribution System Resiliency	10/1/2019	9/30/2022		0	125,523	125,523
Pacific Northwest National L	PN20014/3241	Developing Components of the Battery Digital Twin	10/1/2019	9/30/2022		0	369,168	369,168
Pacific Northwest National L	PN20015/3242	Metastable Substructures and Their Thermodynamic Properties	10/1/2019	9/30/2022		0	154,712	154,712
Pacific Northwest National L	PN20016/3243	Organic Molecule and Electrolyte Formulation Data Generation and Modeling	10/1/2019	9/30/2022		0	2,272,725	2,272,725
Pacific Northwest National L	PN20017/3244	Modeling of Low Temperature Heat Transfer	10/1/2019	9/30/2022		0	137,044	137,044
Pacific Northwest National L	PN20018/3245	Chemical Dynamics: Big and Sparse Data Sciences Integration with Theory, Experiment, Simulations, and Uncertainty Quantification	10/1/2019	9/30/2022		0	231,551	231,551
Pacific Northwest National L	PN20019/3246	Data Science Based Redox Molecule Design Formulations for Flow Battery	10/1/2019	9/30/2022		0	262,953	262,953
Pacific Northwest National L	PN20020/3247	Lithium-ion Battery Design for Grid-scale Energy Storage Applications	10/2/2019	9/30/2022		0	71,040	71,040
Pacific Northwest National L	PN20021/3248	Optimal Placement and Real-time Coordination of Fleet Charging Infrastructure by Co-simulating Transportation and Electric Grid	10/7/2019	9/30/2022		0	158,602	158,602
Pacific Northwest National L	PN20022/3249	Radiation-Induced Catalysis of Chemical Reactions	10/7/2019	9/30/2022		0	74,271	74,271
Pacific Northwest National L	PN20023/3250	Real-time, Wireless Access to Sensor Data Using Telemetry for Monitoring the Deep Subsurface	10/7/2019	9/30/2022		0	97,780	97,780
Pacific Northwest National L	PN20024/3251	Sustainable Fiber-Vitrimer Composites	10/7/2019	9/30/2022		0	148,063	148,063
Pacific Northwest National L	PN20025/3252	Metal Oxide Nanomaterials Synthesis for Energy Storage via Machine Learning	10/7/2019	9/30/2022		0	70,665	70,665
Pacific Northwest National L	PN20026/3253	Physics Informed Machine Learning for Energy and Environment Applications	10/7/2019	9/30/2022		0	305,679	305,679
Pacific Northwest National L	PN20027/3254	Computationally-driven Discovery and Identification of Small Molecules in Biological Systems	10/10/2019	9/30/2022		0	315,752	315,752
Pacific Northwest National L	PN20028/3255	Process Development and Analysis for Chemical Transformation Technologies	10/10/2019	9/30/2022		0	175,903	175,903

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Pacific Northwest National	PN20029/3256	Modeling Particulate Generation during High Energy Explosive Events using Weather Research and Forecasting Model Coupled to Chemistry	10/10/2019	9/30/2022		0	9,721	9,721
Pacific Northwest National	PN20030/3257	Electrocatalytic Processing of Carboxylic Acids, Amines and other Hydrocarbons	10/10/2019	9/30/2022		0	275,494	275,494
Pacific Northwest National	PN20031/3258	A Modular Chemo-selective Oxygen Production Unit to Deliver Oxygen for Combustion Systems	10/15/2019	9/30/2022		0	98,011	98,011
Pacific Northwest National	PN20032/3259	Ecosystem Services Valuation Methodology for Tradeoff Analysis and Value Estimation	10/15/2019	9/30/2022		0	58,844	58,844
Pacific Northwest National	PN20033/3260	Detection, Characterization, and Attribution of Deception in Documents using Topology	10/24/2019	9/30/2022		0	193,351	193,351
Pacific Northwest National	PN20034/3261	Synthesis of Novel Two Dimensional Materials and Development of Electrical Testbed for Measuring Properties of Functional Materials	10/24/2019	9/30/2022		0	199,737	199,737
Pacific Northwest National	PN20035/3262	Applying Novel Analytical Tools for Analyzing Multi-instrument Secondary Organic Aerosols Measurements	10/25/2019	9/30/2022		0	72,350	72,350
Pacific Northwest National	PN20036/3263	Establishing a Software Platform for Atmospheric Data Assimilation Research	10/25/2019	9/30/2022		0	117,919	117,919
Pacific Northwest National	PN20037/3264	Creation of Laboratory-scale Testbed for Autonomous Monitoring and Control of Subsurface Systems	10/28/2019	9/30/2022		0	124,026	124,026
Pacific Northwest National	PN20038/3265	Leveraging Advanced Materials for the Improvement of Cementitious Waste Forms	10/28/2019	9/30/2022		0	158,249	158,249
Pacific Northwest National	PN20039/3266	Analyzing Cyber Impacts in Blended Discrete-continuous Cyber-physical Systems under Adversarial Uncertainties	10/29/2019	9/30/2022		0	261,972	261,972
Pacific Northwest National	PN20040/3267	From Fair, Robust, and Transparent Neural Models to Human Perceptions of Deception	10/29/2019	9/30/2022		0	198,886	198,886
Pacific Northwest National	PN20041/3268	Modeling of Impurity Migration and Diffusion in At-Scale Actinide Casting Systems	11/1/2019	9/30/2022		0	275,472	275,472
Pacific Northwest National	PN20042/3269	A Radiation-shielded, Shallow Underground, Long-coherence Time Quantum Qubit Concept	11/5/2019	9/30/2022		0	119,632	119,632
Pacific Northwest National	PN20043/3270	Urban-scale Building Energy Modeling for Load Prediction	11/5/2019	9/30/2022		0	100,365	100,365
Pacific Northwest National	PN20044/3271	Light Element Separation	11/6/2019	9/30/2022		0	190,910	190,910
Pacific Northwest National	PN20045/3272	Upgrading Lignin to Bioproducts through Bioprospecting with Chemical Probes	11/19/2019	9/30/2022		0	98,801	98,801
Pacific Northwest National	PN20046/3273	Multiscale Modeling of the Mechanism of Electrocatalytic Hydrogenation	12/6/2019	9/30/2022		0	172,759	172,759
Pacific Northwest National	PN20047/3274	Development of a Robust Score and False Discovery Rate for Metabolite Identification	1/6/2020	1/5/2023		0	150,273	150,273
Pacific Northwest National	PN20048/3275	Integrative Fungal Lipidomics Map: A Tool to Visualize Lipid Metabolism in Large Omics Experiments	1/7/2020	1/6/2023		0	72,017	72,017
Pacific Northwest National	PN20049/3276	Comprehensive Multiphysics Simulation Platform for Mass Spectrometry	1/8/2020	1/7/2023		0	142,105	142,105
Pacific Northwest National	PN20050/3277	Quantum Chemistry-Based Predictive Approach for Ionization and Fragmentation	1/8/2020	1/7/2023		0	147,005	147,005
Pacific Northwest National	PN20051/3278	Utilizing Elemental mass spectrometry/mass spectrometry for Fundamental Characterization of Gas Phase Ion- Molecule Interactions	1/8/2020	1/7/2023		0	200,398	200,398
Pacific Northwest National	PN20052/3279	High-throughput Screening for Protein-deoxyribonucleic Acid Interactions in Sorghum	1/10/2020	1/9/2023		0	45,491	45,491
Pacific Northwest National	PN20053/3280	Optimization of Localized High Concentration Electrolytes for Lithium/Lithium Cobalt Oxide Batteries used in Consumer Electronics Applications	1/10/2020	1/9/2023	NA	0	100,471	100,471

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Pacific Northwest National L	PN20054/3281	Enabling Biological Threat Characterization with Novel Three-Dimensional Printed Tissues	1/17/2020	1/16/2023	NA	0	148,037	148,037
Pacific Northwest National L	PN20055/3282	Development of Engineered Metal-Organic Framework materials for perfluorooctane sulfonate Remediation	1/22/2020	1/21/2023	NA	0	60,814	60,814
Pacific Northwest National L	PN20056/3283	Thermometric Temperature Measurement of Deforming Solids	1/22/2020	1/21/2023	NA	0	49,783	49,783
Pacific Northwest National L	PN20057/3284	Quantum Algorithms for Simulation and Machine Learning	1/24/2020	1/23/2023	NA	0	99,752	99,752
Pacific Northwest National L	PN20058/3285	In-situ Mechanical Alloying through Shear-assisted Processing and Extrusion	1/29/2020	1/28/2023	NA	0	35,194	35,194
Pacific Northwest National L	PN20059/3286	Automated Red Teaming for Cyber Physical Systems Team	1/29/2020	1/28/2023	NA	0	100,585	100,585
Pacific Northwest National L	PN20060/3287	Deep Learning Control with Embedded Physical Structure: An Efficient Framework for Constrained Decision-making Systems	1/29/2020	1/28/2023	NA	0	152,811	152,811
Pacific Northwest National L	PN20061/3288	Sequential Decision Making for Mesh Refinement and Model Selection in Multi-scale, Multi-physics Applications	1/31/2020	1/30/2023	NA	0	99,884	99,884
Pacific Northwest National L	PN20062/3289	Towards Threat-agnostic Biorisk Assessment using Nanoproteomics with a Lung-on-a-chip Platform	1/31/2020	1/30/2023	NA	0	146,451	146,451
Pacific Northwest National L	PN20063/3290	Understanding Spin Coherence in Polyoxometalate-Based Molecular Qubits	1/31/2020	1/30/2023	NA	0	50,477	50,477
Pacific Northwest National L	PN20064/3291	Artificial Judgement Assistance from text	2/5/2020	2/4/2023	N/A	0	164,301	164,301
Pacific Northwest National L	PN20065/3292	Evaluating Effects of Shear Processing on Two Dimensional Crystalline Materials	2/10/2020	2/9/2023	N/A	0	14,358	14,358
Pacific Northwest National L	PN20066/3293	Internal Temperature and Stress Measurement Using Ultrasound	2/10/2020	2/9/2023	N/A	0	54,223	54,223
Pacific Northwest National L	PN20067/3294	Assessing Uncertainty and Parameter Sensitivity in the Representation of Methane Processes in Coastal Floodplain Ecosystems	2/10/2020	2/9/2023	N/A	0	116,039	116,039
Pacific Northwest National L	PN20068/3295	Structures via Reasoning - Applying Artificial Intelligence to Cryo-Electron Microscopy to Reveal Structural Variability	2/11/2020	2/10/2023	N/A	0	135,593	135,593
Pacific Northwest National L	PN20069/3296	Probabilistic Model Discovery with Uncertainty Quantification	2/12/2020	2/11/2023	N/A	0	99,671	99,671
Pacific Northwest National L	PN20070/3297	Causal Reasoning for Predicting Viral Pathogenicity and Identifying Targets for Medical Countermeasures	2/13/2020	2/12/2023	N/A	0	212,050	212,050
Pacific Northwest National L	PN20071/3298	Defining Lipidomic Responses to Coronavirus Infection	2/20/2020	2/19/2023	N/A	0	142,842	142,842
Pacific Northwest National L	PN20072/3299	Development of a Compact Ion Mobility Spectrometry Platform	2/21/2020	2/20/2023	N/A	0	96,158	96,158
Pacific Northwest National L	PN20073/3300	Artificial Intelligence for Materials Manufactured using Shear Assisted Processing and Extrusion	2/27/2020	2/26/2023	N/A	0	48,806	48,806
Pacific Northwest National L	PN20074/3301	Solid Phase Gradient Alloying Method via Shear-assisted Processing and Extrusion	3/10/2020	3/9/2023		0	8,382	8,382
Pacific Northwest National L	PN20075/3302	Atomic-scale insight into the shear-induced transformations of metals and metal alloys	3/13/2020	3/12/2023		0	102,070	102,070
Pacific Northwest National L	PN20076/3303	High-performing Electrocatalysts for Oxygen Reduction and Evolution for Energy Storage Applications	3/18/2020	3/17/2023		0	97,045	97,045
Pacific Northwest National L	PN20077/3304	Next Generation Microfluidics Platform for High Throughput Single Cell Proteomics	3/20/2020	3/19/2023		0	60,025	60,025
Pacific Northwest National L	PN20078/3305	Exploring the Potential of Using Near-Infrared Radiance of vegetation Radiance to Approximate Gross Primary Productivity	3/20/2020	3/19/2023		0	49,730	49,730

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Pacific Northwest National L	PN20079/3306	Probing Cooperation and Competition between Paenibacillus polymyxa and Setaria viridis under Nutrient Stress	3/24/2020	3/23/2023		0	49,467	49,467
Pacific Northwest National L	PN20080/3307	Ethanol to Para-xylene via Methyl Benzaldehyde	3/24/2020	3/23/2023		0	149,661	149,661
Pacific Northwest National L	PN20081/3308	The Development of Novel Organomanganese Hydration Catalysts and Uranium Oxo-imido Complexes to Provide Insights into Redox Chemistry and Bonding Properties	4/6/2020	4/5/2023		0	291,447	291,447
Pacific Northwest National L	PN20082/3309	Optimizing Cell-based Antimicrobials through Pooled Genomic Libraries	4/17/2020	4/16/2023		0	52,347	52,347
Pacific Northwest National L	PN20084/3311	The Role of Defects and Solid/Liquid Interfacial Interactions on Controlling Anisotropic Growth of Novel Two dimensional Materials	5/15/2020	5/14/2023		0	59,681	59,681
Pacific Northwest National L	PN20086/3313	Low-Temperature Titanium Electroplating Using Ionic Mixtures	6/2/2020	6/1/2023		0	47,712	47,712
Pacific Northwest National L	PN20087/3314	Solid Phase Processing of Ultra-High Conductivity Aluminum Composites	6/2/2020	6/1/2023		0	44,500	44,500
Pacific Northwest National L	PN20088/3315	Spatial and molecular drivers of microbial function	6/2/2020	6/1/2023		0	27,538	27,538
Pacific Northwest National L	PN20089/3316	High-throughput Physiochemical and Biogeochemical Characterization for Coastal Soils and Waters	6/3/2020	6/2/2023		0	487,173	487,173
Pacific Northwest National L	PN20091/3318	Multi-omics Characterization of the Host Response to CoronaVirus Disease-2019	6/12/2020	6/11/2023		0	43,062	43,062
Pacific Northwest National L	PN20092/3319	Coronavirus Disease-2019 - Severity Prediction Models for Multi-Scale Multi-Modal Electronic Health Records	6/15/2020	6/14/2023		0	82,774	82,774
Pacific Northwest National L	PN20093/3320	Machine Learning Software for Cylindrical Battery Design and Performance Prediction	6/15/2020	6/14/2023		0	44,166	44,166
Pacific Northwest National L	PN20094/3321	Seed Enabling fifth generation Research and Development	6/17/2020	6/16/2023		0	92,383	92,383
Pacific Northwest National L	PN20095/3322	(Cyber Security) Research to Operations and Operations to Research	6/17/2020	6/16/2023		0	21,510	21,510
Pacific Northwest National L	PN20096/3323	Advanced Mineral Extraction and Water Processing	6/19/2020	6/18/2023		0	41,924	41,924
Pacific Northwest National L	PN20097/3324	Lab-on-a-Fish Transmitter for Real-time Fish Behavior and Physiology Monitoring	6/19/2020	6/18/2023		0	19,828	19,828
Pacific Northwest National L	PN20098/3325	Automated Electron Microscope Data Collection, Triaging, and Classification Platform	6/19/2020	6/18/2023		0	58,880	58,880
Pacific Northwest National L	PN20099/3326	Does Coronavirus Disease-2019 and seasonal flu have similar meteorology and air quality controls driving their spread?	6/22/2020	6/21/2023		0	48,592	48,592
Pacific Northwest National L	PN20100/3327	Computational screening and AI-based design for activity-based probes	6/30/2020	6/29/2023		0	98,805	98,805
Pacific Northwest National L	PN20101/3328	Viral Inhibitors from Algae - Generating Extracts for Antiviral Activity Assays	6/30/2020	6/29/2023		0	49,526	49,526
Pacific Northwest National L	PN20102/3329	Enhanced, Flexible, Water-repellant Protective Coatings	7/2/2020	7/1/2023		0	89,634	89,634
Pacific Northwest National L	PN20103/3330	Silicon-Based Anodes for Long-Cycle-Life Lithium-ion Batteries	7/2/2020	7/1/2023		0	150,506	150,506
Pacific Northwest National L	PN20104/3331	Assimilating Scanning Radar Data into High-Resolution Models	7/7/2020	7/6/2023		0	31,689	31,689
Pacific Northwest National L	PN20105/3332	Nanoscale Chemical Imaging of Pristine and Nano-Patterned Low-Dimensional Quantum Materials	7/7/2020	7/6/2023		0	20,885	20,885
Pacific Northwest National L	PN20106/3333	Uncovering of unknown ribonucleic acid viruses in permafrost using a novel computational workflow	7/15/2020	7/14/2023		0	40,626	40,626
Pacific Northwest National L	PN20107/3334	Development of Computational Software for High Precision Collisional Cross Section Measurements	7/17/2020	7/16/2023		0	23,443	23,443
Pacific Northwest National L	PN20108/3335	Hydrothermal Recovery of Rare Earth Elements and Critical Materials	8/3/2020	8/2/2023		0	53,273	53,273

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Pacific Northwest National	PN20109/3336	Interfacing Atmospheric Flow Tube to Ion Mobility Spectrometry	8/4/2020	8/3/2023		0	48,062	48,062
Pacific Northwest National	PN20110/3337	Development of Metal-Organic Framework Materials for Forever-Chemical Capture and Sensing in Water	8/4/2020	8/3/2023		0	34,523	34,523
Pacific Northwest National	PN20111/3338	Oxygenate Onboard Separation for Octane-On-Demand	8/4/2020	8/3/2023		0	33,262	33,262
Pacific Northwest National	PN20112/3339	Affordable Real time Viral Detection	8/5/2020	8/4/2023		0	51,083	51,083
Pantex Plant	PX185200	Improved Characterization of Critical Electrical Props and Hazards for Lightning	10/1/2017	9/30/2020		0	469,676	469,676
Pantex Plant	PX185205	Ignition Mechanisms of Explosives during Drilling and Skidding	10/1/2017	9/30/2020		0	526,421	526,421
Pantex Plant	PX185206	Photon Doppler Velocimetry System Upgrades and Improvements	10/1/2017	9/30/2020		0	62,417	62,417
Pantex Plant	PX185209	Online Monitoring and Remote Sensing During High Explosive Aging	10/1/2017	9/30/2020		0	84,584	84,584
Pantex Plant	PX185211	Use of Pycnometry for Density of Explosives and Polymers and Powders	10/1/2017	9/30/2020		0	44,606	44,606
Pantex Plant	PX190299	Autonomous Mobile Bay Equipment Retriever Demonstration	10/1/2018	9/30/2020		0	149,288	149,288
Pantex Plant	PX190686	Performance Management Program Usability and Functionality Enhancement	10/1/2018	9/30/2021		0	138,796	138,796
Pantex Plant	PX190691	Rapid Response Planning for Unmanned Aircraft Systems Usage at Consolidated Nuclear Security Sites Study	10/1/2018	9/30/2021		0	184,360	184,360
Pantex Plant	PX195843	Replacement of Hexanitrostilbene Insoluble Testing	10/1/2018	9/30/2020		0	116,138	116,138
Pantex Plant	PX195927	In-situ Inspection of Metal Laser Additive Manufacturing Processes	10/1/2018	9/30/2021		0	926,784	926,784
Pantex Plant	PX195932	Test Fire High Voltage Monitoring	10/1/2018	9/30/2020		0	317,608	317,608
Pantex Plant	PX195942	Wireless Property Tracking	10/1/2018	9/30/2021		0	78,026	78,026
Pantex Plant	PX195950	Microreactor Synthesis of Explosive 2,6-diamino-3,5-dinitropyrazine-1-oxide	10/1/2018	9/30/2021		0	208,933	208,933
Pantex Plant	PX195958	Scratch Depth Measurement Enhancement	10/1/2018	9/30/2021		0	126,003	126,003
Pantex Plant	PX196142	Blending Improvements of Non-Flow Sylgards Used on Production Potting Operations	10/1/2018	9/30/2021		0	50,985	50,985
Pantex Plant	PX196183	Physical Security Tactical Network	10/1/2018	9/30/2021		0	618,769	618,769
Pantex Plant	PX196253	Facility Management Technology/Data Integration Initiative	10/1/2018	9/30/2021		0	656,573	656,573
Pantex Plant	PX196254	Tandem Gas Analysis Workstation for Multicomponent Samples	10/1/2018	9/30/2021		0	554,052	554,052
Pantex Plant	PX196517	Seismo-Acoustic Study	10/1/2018	9/30/2021		0	231,015	231,015
Pantex Plant	PX196533	Texas Agricultural and Mechanical University Research Network	10/1/2018	9/30/2021		0	63,757	63,757
Pantex Plant	PX200892	Explosives Breaching Feasibility Study at Pantex	10/1/2019	9/30/2020		0	26,545	26,545
Pantex Plant	PX20A02B	In-Situ Static Charge Measurement System	10/1/2019	9/30/2020		0	28,377	28,377
Pantex Plant	PX20A03B	Testing of Additively Manufactured Electro-Static Discharge Polymers	10/1/2019	9/30/2020		0	10,390	10,390
Pantex Plant	PX20A370	Supplemental Humidity Abatement	10/1/2019	9/30/2020		0	19,639	19,639
Pantex Plant	PX20A430	Fully Autonomous Sample Tester	10/1/2019	9/30/2022		0	222,168	222,168
Pantex Plant	PX20C530	Semantic Document Search Engine	10/1/2019	9/30/2020		0	60,885	60,885
Pantex Plant	PX20H02C	Development of High-Density Additive Manufacturing Materials	10/1/2019	9/30/2020		0	60,830	60,830
Pantex Plant	PX20H050	Use of Table Top Nuclear Magnetic Resonance for Evaluation of Microreactor Products	10/1/2019	9/30/2020		0	181,684	181,684
Pantex Plant	PX20H890	Projectile Impact System Modification	10/1/2019	9/30/2022		0	426,912	426,912
Pantex Plant	PX20P040	Establishing New Solvents for Gel Permeation Chromatography Analysis of Kel-F™ Replacement and Viton with Online Nuclear Magnetic Resonance	10/1/2019	9/30/2020		0	109,733	109,733

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Pantex Plant	PX20P400	Epoxy Removal from Aluminum Test Blocks	10/1/2019	9/30/2022		0	67,138	67,138
Pantex Plant	PX20S290	Modernization and Standardization of Emergency Operations Surveillance System	10/1/2019	9/30/2022		0	46,894	46,894
Pantex Plant	PX20T280	Modeling and Simulation Test Bed Development	10/1/2019	9/30/2022		0	86,667	86,667
Princeton Plasma Physics La	PPPL-065	Development of New Initiatives for Space Instrumentation and Space Plasma Physics Research at Princeton Plasma Physics Lab	8/15/2016	8/14/2019		-	12	12
Princeton Plasma Physics La	PPPL-066	Permeation barriers in high atomic number materials used for fusion-reactor plasma-facing components	2/1/2017	1/31/2020		-	6,940	6,940
Princeton Plasma Physics La	PPPL-067	Proton Beam X-ray Diagnostics	2/1/2017	1/31/2020		-	49,190	49,190
Princeton Plasma Physics La	PPPL-068	Gyrokinetic total simulation of edge and divertor transport in stellarators with the X-point included gyrokinetic codes	5/22/2017	5/21/2020		-	84,031	84,031
Princeton Plasma Physics La	PPPL-070	Definition of a next-step liquid-metal-wall toroidal confinement facility	2/1/2017	1/31/2020		-	14,848	14,848
Princeton Plasma Physics La	PPPL-071	Future Stellarator Configuration Investigation	2/1/2017	1/31/2020		-	117,668	117,668
Princeton Plasma Physics La	PPPL-072	A Flowing Liquid Metal Torus - This is a proposal for fabrication of equipment and initial operation of a toroidal test system to study the technology of fast flowing liquid metal plasma-facing surfaces. The project will focus in the near term on developing a liquid metal divertor suitable for implementation and testing in present-day fusion systems.	3/8/2017	3/7/2020		-	72,667	72,667
Princeton Plasma Physics La	PPPL-076	Development of Magnetic Enhancement Coils for a Fast Time Response Electromagnetic Disruption Mitigation System	10/1/2017	9/30/2019		-	(228)	(228)
Princeton Plasma Physics La	PPPL-078	Feasibility Study of a Laser-Based Approach for Diagnosing Deuterium Neutrals in the Edge of Fusion Devices	1/23/2019	6/1/2020		-	11,510	11,510
Princeton Plasma Physics La	PPPL-079	Mapping of Magnetic Field Lines in the Earth's Magnetosphere Using and Electron Beam	1/2/2018	9/30/2019		-	5,010	5,010
Princeton Plasma Physics La	PPPL-080	Quantum Computing for Fusion Energy Sciences	3/15/2019	3/14/2022		-	72,818	72,818
Princeton Plasma Physics La	PPPL-081	Plasma Transport Processes in High-Energy Density Plasmas	1/23/2019	1/22/2022		-	93,466	93,466
Princeton Plasma Physics La	PPPL-082	Lithium Vapor Box Test and Concept Development for Application in Toroidal Devices	1/23/2019	1/22/2022		-	270,972	270,972
Princeton Plasma Physics La	PPPL-083	Prototyping and Testing of 10 kiloampere Level Superconducting Cables for Fusion Nuclear Spherical Tokamak and Stellarator Pilot Plants	1/23/2019	1/22/2022		-	124,531	124,531
Princeton Plasma Physics La	PPPL-084	Prototype Development for an Electromagnetic Particle Injector	1/23/2019	1/22/2022		-	77,502	77,502
Princeton Plasma Physics La	PPPL-085	Adaptive Near-Real Time Networked Analysis of Big Fusion Data	1/23/2019	1/22/2022		-	172,859	172,859
Princeton Plasma Physics La	PPPL-086	Scoping of Facilities in Support of Long-Term Princeton Plasma Physics Laboratory Initiatives	4/1/2019	1/31/2020		-	49,303	49,303
Princeton Plasma Physics La	PPPL-087	Integration of Deep Learning Disruption Predictor with Advanced Plasma Control System	4/1/2019	3/31/2022		-	278,385	278,385
Princeton Plasma Physics La	PPPL-088	Arc-Produced Superhard Materials	4/1/2019	3/31/2020		-	23,417	23,417
Princeton Plasma Physics La	PPPL-089	A Laser-Assisted Plasma-Based Method for Selective Synthesis of Complex Nanomaterials	4/1/2019	3/31/2022		-	219,471	219,471
Princeton Plasma Physics La	PPPL-090	Microplasma Propulsion System for Space Science Missions with Cubesats	4/1/2019	3/31/2022		-	82,139	82,139
Princeton Plasma Physics La	PPPL-091	Configuration Studies for Sustained High-Power Density Tokamaks	10/1/2019	9/30/2022		-	354,131	354,131
Princeton Plasma Physics La	PPPL-092	Stellarator Pilot Plant Initiative	10/1/2019	9/30/2022		-	384,652	384,652

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Princeton Plasma Physics La	PPPL-094	Extending the nonlinear magnetohydrodynamic code to stellarator geometry	12/20/2019	12/19/2022		-	129,160	129,160
Princeton Plasma Physics La	PPPL-096	Development of an Initiative for Extreme Ultraviolet Plasma-Assisted Lithography Laboratory at Princeton Plasma Physics Lab	9/1/2020	8/31/2023		-	10,828	10,828
Princeton Plasma Physics La	PPPL-097	Princeton Plasma Physics Lab Systems Code	3/30/2020	3/29/2022		-	96,856	96,856
Princeton Plasma Physics La	PPPL-098	Open Source Exascale Particle-in-Cell Codes for Industrial Applications	10/1/2019	9/30/2022		-	231,662	231,662
Princeton Plasma Physics La	PPPL-099	Full wave simulations in a three dimensional realistic magnetospheric geometry	10/1/2019	9/30/2022		-	137,571	137,571
Princeton Plasma Physics La	PPPL-100	Metastable Nuclear Isomer of Technetium-99 Production through Molybdenum Stable Isotope Enrichment and Transformation	10/1/2019	3/30/2022		-	44,161	44,161
Princeton Plasma Physics La	PPPL-101	Diagnostic Development and Proof-of-Concept Experiments to use Reynolds Stress Measurements in a Taylor-Couette Device for Studying Angular Momentum Transport in Solar Flows	10/1/2019	9/30/2020		-	83,577	83,577
Princeton Plasma Physics La	PPPL-102	Helicity Injection Reconnecting Plasmoid Thruster	10/1/2019	9/30/2020		-	71,707	71,707
Princeton Plasma Physics La	PPPL-103	An Initial Experimental Study of Plasma Jet Formation Associated with Spheromak Tilt Instability	10/1/2019	9/30/2020		-	95,643	95,643
Princeton Plasma Physics La	PPPL-104	Permanent Magnet Stellarator Studies	1/15/2020	12/31/2021		-	60,430	60,430
Princeton Plasma Physics La	PPPL-105	Innovative Approaches to Fast Track Fusion Facilities by Reducing the Cost	3/16/2020	9/30/2022		-	57,606	57,606
Princeton Plasma Physics La	PPPL-106	Facility and Diagnostics for Plasma Processing and Nanofabrication Research	4/20/2020	4/19/2023		-	179,053	179,053
Princeton Plasma Physics La	PPPL-107	Coronavirus 2019-Fast-Track Initiatives	4/27/2019	4/27/2021		-	67,677	67,677
Sandia National Labs	199972	Three-Dimensional Multicolor Superresolution Microscopy for Imaging the Machinery of Cells and Capturing Biochemical Interfaces	11/14/2016	11/13/2019	Principal Investigator was a Truman Fellow whose start date at Sandia got pushed out to 11/14/2016, thus the work on this project did not start until that date. So although the dates span 4 fiscal years, the work did not exceed 36 months.	0	32,014	32,014
Sandia National Labs	209190	Engineering Cells for Personalized Antimicrobial Therapy	10/1/2017	9/18/2020		0	553,410	553,410
Sandia National Labs	209191	Diversified Therapeutic Phage Cocktails from Close Relatives of the Target Bacterium	10/1/2017	9/18/2020		0	605,201	605,201
Sandia National Labs	209194	Linear Programming in Strongly Polynomial Time	10/1/2017	9/18/2020		0	409,202	409,202
Sandia National Labs	209195	Distributed-In-Time Techniques for Optimization at Extreme Scales	10/1/2017	12/31/2020	Project experienced significant delays due to COVID-19. NNSA approved exception to 36-month time limit.	0	446,615	446,615
Sandia National Labs	209196	Mixed-Integer Partial-Differential-Equation-Constrained Optimization	10/1/2017	9/18/2020		0	519,490	519,490
Sandia National Labs	209197	Efficient, Scalable Tomography of Many-Qubit Quantum Processors	10/1/2017	9/18/2020		0	348,252	348,252
Sandia National Labs	209200	Building the World's First Laser Refrigerated Sensor	10/1/2017	9/18/2020		0	389,704	389,704
Sandia National Labs	209201	Shock Tube Measurements of Hot Dense Gas Luminosity and Opacity for Constructing Opacity Tables	10/1/2017	9/18/2020		0	409,832	409,832
Sandia National Labs	209202	Ultra-Efficient Sensing System through Holistic Design	10/1/2017	9/18/2020		0	434,816	434,816
Sandia National Labs	209204	Miniaturized Explosive Test for Optical Emission Diagnostics	10/1/2017	9/18/2020		0	392,038	392,038
Sandia National Labs	209205	Chip-Scale Nano-Optomechanical Platform for High-Bandwidth, High-Efficiency Radio Frequency Signal Processing	10/1/2017	9/18/2020		0	268,851	268,851

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Sandia National Labs	209208	Efficient Real-Time Cognition at the Point of Sensing	10/1/2017	9/18/2020		0	210,369	210,369
Sandia National Labs	209209	Intelligent Customized Spot Shielding for Microelectronics in Space Applications	10/1/2017	1/31/2021	Project experienced significant delays due to COVID-19. NNSA approved exception to 36-month time limit.	0	252,205	252,205
Sandia National Labs	209210	Autonomous Detection and Assessment with Moving Sensors: A Foundation for Future Physical Security Systems	10/1/2017	9/18/2020		0	655,862	655,862
Sandia National Labs	209212	Data Enrichment for Improved Intelligence Value and Situational Awareness	10/1/2017	9/18/2020		0	356,303	356,303
Sandia National Labs	209215	Rapid Assessment of Autoignition Propensity in Novel Fuels and Blends	10/1/2017	9/18/2020		0	378,715	378,715
Sandia National Labs	209217	A Predictive Model for Arctic Coastal Erosion	10/1/2017	9/18/2020		0	760,136	760,136
Sandia National Labs	209218	Probiotic, Optimized Strains of Specifically Engineered Bacteria	10/1/2017	9/18/2020		0	421,916	421,916
Sandia National Labs	209219	Coupling of Laminar-Turbulent Transition Modeling with Reynolds-averaged Navier-Stokes Computational Fluid Dynamics	10/1/2017	9/18/2020		0	489,715	489,715
Sandia National Labs	209222	Explosive Challenge: Revolutionizing Spatial and Temporal Blast Characterization	10/1/2017	9/18/2020		0	728,876	728,876
Sandia National Labs	209223	Connecting Polymer Physics and Microstructure With Large-Deformation Polymer Foam Mechanics	10/1/2017	1/31/2021	Project experienced significant delays due to COVID-19. NNSA approved exception to 36-month time limit.	0	673,962	673,962
Sandia National Labs	209224	Role of Phonon-to-Vibration Energy Transfer in Initiation of Energetic Materials	10/1/2017	9/18/2020		0	376,140	376,140
Sandia National Labs	209230	Arctic Tipping Points Triggering Global Change	10/1/2017	9/18/2020		0	515,804	515,804
Sandia National Labs	209234	Characterization and Sampling of Ultralow Permeability Geomaterials using Electrokinetics	10/1/2017	9/18/2020		0	257,931	257,931
Sandia National Labs	209237	Real-Time Subsurface Event Assessment and Detection	10/1/2017	3/31/2021	Project experienced significant delays due to COVID-19. NNSA approved exception to 36-month time limit.	0	957,234	957,234
Sandia National Labs	209238	Strategic Inertial Guidance with Matterwaves	10/1/2017	9/18/2020		0	5,762,861	5,762,861
Sandia National Labs	209239	Electro Magnetic Pulse-Resilient Electric Grid for National Security	10/1/2017	9/18/2020		0	2,525,132	2,525,132
Sandia National Labs	209240	Towards Predictive Plasma Science and Engineering through Revolutionary Multi-Scale Algorithms and Models	10/1/2017	9/18/2020		0	5,205,453	5,205,453
Sandia National Labs	209241	Advanced Models of the Physics and Phenomena of Electrical Discharge	10/1/2017	9/18/2020		0	1,594,682	1,594,682
Sandia National Labs	209243	Describing the Chemical Steps of Hydrogen Incorporation in Metal Hydrides using Time-Resolved Environmental X-ray Photoelectron Spectroscopy	10/1/2017	9/18/2020		0	626,672	626,672
Sandia National Labs	209244	Identifying Rare, Disqualifying Flaws in Additively Manufactured Components	10/1/2017	9/18/2020		0	662,844	662,844
Sandia National Labs	209245	Nanomaterial Ink Development for Smart Manufacturing	10/1/2017	9/18/2020		0	257,094	257,094
Sandia National Labs	209246	High Entropy Alloys: A Materials Solution to Metals Additive Manufacturing	10/1/2017	9/18/2020		0	511,652	511,652
Sandia National Labs	209248	Mitigation of Point Defects in Wide-Bandgap Semiconductors by Photo-Modification of Fermi Level during Growth	10/1/2017	9/18/2020		0	522,295	522,295
Sandia National Labs	209249	An Interfacial Synaptic Transistor for Fast Neuromorphic Computing	10/5/2017	9/18/2020		0	256,268	256,268
Sandia National Labs	209250	Asynchronous Ballistic Reversible Computation with Superconducting Josephson Junctions	10/1/2017	9/18/2020		0	580,496	580,496

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Sandia National Labs	209251	Low-Power High-Speed Transistors Enabled by Ferroelectric Hafnium Oxide	10/1/2017	9/18/2020		0	527,081	527,081
Sandia National Labs	209253	High-Voltage Power-Transistors Enabled by Selective Area Regrowth of positive type/negative type Junctions Using Ultra-wide Bandgap Nitride Semiconductors	10/1/2017	9/18/2020		0	673,920	673,920
Sandia National Labs	209254	Demonstrating Robustness of Analogue Quantum Simulators	10/1/2017	9/18/2020		0	366,400	366,400
Sandia National Labs	209255	Wide-Range Solid-State Tuning for Acoustoelectronics	10/1/2017	9/18/2020		0	473,946	473,946
Sandia National Labs	209256	Convolutional Scattering Networks for Autonomy	10/1/2017	9/18/2020		0	163,271	163,271
Sandia National Labs	209259	Suitability of Advanced Antenna Window Materials for Extreme Re-entry Environments	10/1/2017	9/18/2020		0	134,881	134,881
Sandia National Labs	209261	Activity Waveforms: Measuring and Comparing the Rhythms of Complex Behaviors	10/1/2017	9/18/2020		0	301,569	301,569
Sandia National Labs	209262	Semi-Autonomous Methods for Rapid Prototyping of Software Defined Radiofrequency Counter-Unmanned Aerial System Techniques	10/1/2017	9/18/2020		0	573,523	573,523
Sandia National Labs	209263	Microelectronics-Based Neutron and Spectroscopic Gamma Detectors Using Compound Semiconductors	10/1/2017	9/18/2020		0	509,847	509,847
Sandia National Labs	209264	Single Chip Micro Electro Mechanical Systems Ultrasonic Imaging System	10/1/2017	3/31/2021	Project experienced significant delays due to COVID-19. NNSA approved exception to 36-month time limit.	0	356,410	356,410
Sandia National Labs	209266	Diagnosing and Destroying Non-Markovian Noise in Qubits	10/1/2017	9/18/2020		0	336,014	336,014
Sandia National Labs	209267	Synthetic Aperture Radar Image Formation and Feedback to Navigation Subsystem in Global Position System Denied and Degraded Environments	10/1/2017	9/18/2020		0	789,998	789,998
Sandia National Labs	209269	Language-Independent Software Analysis	10/1/2017	9/18/2020		0	201,968	201,968
Sandia National Labs	209270	Predictable Lifetime Devices	10/1/2017	9/18/2020		0	244,720	244,720
Sandia National Labs	209271	Enabling Atomic Layer Precision during Circuit Edit and Global Back-Side Ultra-Thinning: A Path to Improved Failure Analysis of State-of-the-Art Microelectronic Devices	10/1/2017	9/18/2020		0	289,071	289,071
Sandia National Labs	209272	Blockchain Derived Secure Computing	10/1/2017	9/18/2020		0	403,845	403,845
Sandia National Labs	209273	Automated Threat Modeling for Cyber Security Analytics and Emulation	10/1/2017	9/18/2020		0	544,085	544,085
Sandia National Labs	209274	Autonomous Sensor Tasking and Scheduling Across Multiple Platforms	10/1/2017	9/18/2020		0	484,324	484,324
Sandia National Labs	209280	Miniature Accelerometers with Sub-Microsecond Timescales for Characterization of Structural Dynamics	10/1/2017	9/18/2020		0	417,843	417,843
Sandia National Labs	209281	Intrinsically Radiation-Hard, High-Voltage, Solid-State Switch	10/1/2017	9/18/2020		0	548,782	548,782
Sandia National Labs	209282	Modular Optical Bus Fabrication by Additive Manufacturing and Heterogeneous Integration	10/1/2017	9/18/2020		0	480,260	480,260
Sandia National Labs	209284	Fuze Positional Awareness and Jammer Resistance from Radar-Based Terrain Aiding	10/1/2017	9/18/2020		0	565,161	565,161
Sandia National Labs	209285	Slurry-Processing Enabled Development of Thin, Large Surface Area, Non-Cylindrical Thermal Batteries for High Power Applications	10/1/2017	9/18/2020		0	417,112	417,112
Sandia National Labs	209287	Modeling Low Density Plasma in Electrode/Target Systems for High Current Pulsed Power	10/1/2017	9/18/2020		0	1,000,125	1,000,125
Sandia National Labs	209289	Advancing the Understanding of Laser-Plasma Interactions in High-Energy Density Plasma	10/1/2017	9/18/2020		0	240,191	240,191

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Sandia National Labs	210403	Cost-Competitive, Scalable and Safe Grid Storage: Sandia's Radical Ion Flow Battery Technology	12/12/2017	9/18/2020		0	590,561	590,561
Sandia National Labs	212413	Development of Alternative Lattice-Matched Buffer Layers and Optimization of Metalorganic Chemical Vapor Deposition Growth for III-Nitride Power Electronics	5/22/2018	9/18/2020		0	82,653	82,653
Sandia National Labs	212430	Distributed Computational Algorithms Focusing on Modeling and Demonstration of Transformer Cyber Resilience	5/23/2018	12/31/2020		0	475,883	475,883
Sandia National Labs	212941	Magnetometer-Aided Navigation for Hypersonic Strike Vehicles	10/1/2018	9/18/2020		0	616,645	616,645
Sandia National Labs	212943	Rapid High-Fidelity Aerothermal Responses with Quantified Uncertainties via Reduced-Order Modeling	10/1/2018	9/17/2021		0	523,051	523,051
Sandia National Labs	212946	Neural-Inspired Approaches and Implementations for Automatic Target Recognition	10/1/2018	9/17/2021		0	656,975	656,975
Sandia National Labs	212947	An Optimization and Robust Control Technique for use in Flight Control Design for Hypersonic Vehicles	10/1/2018	9/18/2020		0	707,787	707,787
Sandia National Labs	212950	Isotopic Fractionation as In Situ Sensor of Subsurface Reactive Flow and Precursor for Rock Failure	10/1/2018	9/17/2021		0	572,082	572,082
Sandia National Labs	212952	Incorporating Physical Constraints into Gaussian Process Surrogate Models	10/1/2018	9/18/2020		0	352,713	352,713
Sandia National Labs	212954	Universal Probing of Short-Lived Intermediates Using Table-Top extreme ultraviolet and vacuum ultraviolet Radiation	10/1/2018	9/17/2021		0	412,876	412,876
Sandia National Labs	212955	Quantum-Based Electron Spin Resonance Platform for Nanomaterials	10/1/2018	9/17/2021		0	567,239	567,239
Sandia National Labs	212957	Clustered regularly interspaced short palindromic repeats Engineering for Rapid Enhancement of Strains	10/1/2018	9/17/2021		0	675,056	675,056
Sandia National Labs	212959	Detection of Clustered Regularly Interspaced Short Palindromic Repeats associated protein 9 Expression in Single, Living Mammalian Cells	10/1/2018	9/17/2021		0	386,294	386,294
Sandia National Labs	212960	Phycoviruses: Virus Discovery and Engineering for Advanced Biofuels	10/1/2018	9/17/2021		0	520,091	520,091
Sandia National Labs	212963	Optomechanical Ultrasound for Cellular Imaging and Tagless Selection	10/1/2018	9/17/2021		0	401,160	401,160
Sandia National Labs	212965	Data Science for Detection of Genome Editing	10/1/2018	9/17/2021		0	409,181	409,181
Sandia National Labs	212967	Energy-Efficient Implementation of Partial Differential Equations by Stochastic and Deterministic Neuromorphic Algorithms	10/1/2018	9/18/2020		0	538,786	538,786
Sandia National Labs	212970	Quantum Manifold Learning	10/1/2018	9/17/2021		0	330,175	330,175
Sandia National Labs	212971	Neuromorphic Graph Algorithms	10/1/2018	9/17/2021		0	415,027	415,027
Sandia National Labs	212974	High Precision Sparse and Dense Analog Matrix Multiplication	10/1/2018	9/17/2021		0	427,629	427,629
Sandia National Labs	212976	Risk-Adaptive Experimental Design for High-Consequence Systems	10/1/2018	9/17/2021		0	507,103	507,103
Sandia National Labs	212978	Emergent Recursive Multiscale Interaction	10/1/2018	9/17/2021		0	648,043	648,043
Sandia National Labs	212979	Asymptotically Compatible strong form foundations for Nonlocal Discretization	10/1/2018	9/17/2021		0	572,358	572,358
Sandia National Labs	212980	Utilizing a Single Particle Aerosol Mass Spectrometer as a Chemical, Biological, Radiological, Nuclear, and high yield Explosives Forensic Tool and Detector	10/1/2018	9/17/2021		0	410,365	410,365
Sandia National Labs	212982	Realistic Emulation of Automated Synthetic Biology Facilities to Prevent Risk of Unintended Manufacture	10/1/2018	9/18/2020		0	509,272	509,272

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Sandia National Labs	212984	Single Particle Aerosol Mass Spectrometry for In-field Characterization of Weapons Production Effluents and Nuclear Detonation Debris	10/1/2018	9/17/2021		0	396,847	396,847
Sandia National Labs	212986	Developing Advanced Neutron Imaging Technology to Determine the State of Shielded Electronics	10/1/2018	9/17/2021		0	479,341	479,341
Sandia National Labs	212987	Application of High Energy Particle Beams to Disable Nuclear Devices	10/1/2018	9/18/2020		0	522,750	522,750
Sandia National Labs	212988	Quantum-Secure Optical Fence for Physical Security	10/1/2018	9/17/2021		0	434,330	434,330
Sandia National Labs	212989	Simulation of a Molten Salt Reactor Facility	10/1/2018	9/17/2021		0	400,323	400,323
Sandia National Labs	212991	Broadband Differential Absorption Lidar for Proliferation Detection	10/1/2018	9/18/2020		0	214,032	214,032
Sandia National Labs	212992	Longwave Infrared Hyperspectral Imager for Unmanned Aerial Systems	10/1/2018	9/18/2020		0	290,939	290,939
Sandia National Labs	212993	Continuous Full-Resolution Two-Color Infrared Detector	10/1/2018	9/17/2021		0	449,300	449,300
Sandia National Labs	212994	Assessing Seismic Analysis and Analyst Performance Using the Normalized Compression Distance Metric	10/1/2018	9/18/2020		0	366,445	366,445
Sandia National Labs	212996	Coherent Intensity Fluctuation Interferometry	10/1/2018	9/18/2020		0	225,821	225,821
Sandia National Labs	212998	Radio Frequency Feature Extraction using Wireless Protocol Informatics, Pattern Matching, and Natural Language Processing	10/1/2018	9/17/2021		0	434,548	434,548
Sandia National Labs	212999	Optical Spectroscopy of Plutonium	10/1/2018	9/18/2020		0	340,074	340,074
Sandia National Labs	213001	Robust Scalable Detection and Tracking For Wide Area Surveillance	10/1/2018	9/17/2021		0	435,805	435,805
Sandia National Labs	213002	Metrology for Distributed Sensing Formations	10/1/2018	9/17/2021		0	463,692	463,692
Sandia National Labs	213003	Building Foundational Capabilities and Understanding for a Sustained Thermal Barrier Coating Research and Development Program for Internal Combustion Engine Applications	10/1/2018	9/17/2021		0	401,013	401,013
Sandia National Labs	213004	A Synthetic Opioid Detector Technology	10/1/2018	9/17/2021		0	571,502	571,502
Sandia National Labs	213005	Advanced Detection of Wellbore Failure for Safe and Secure Utilization of Subsurface Infrastructure	10/1/2018	9/17/2021		0	590,418	590,418
Sandia National Labs	213006	Multi-Resolution Characterization of the Coupling Effects of Molten Salts, High Temperature and Irradiation on Intergranular Fracture	10/1/2018	9/17/2021		0	571,702	571,702
Sandia National Labs	213007	Integrated Multiphysics Modeling of Environmentally Assisted Brittle Fracture	10/1/2018	9/17/2021		0	444,268	444,268
Sandia National Labs	213008	Predictive Data-Driven Platform for Subsurface Energy Production	10/1/2018	9/17/2021		0	521,840	521,840
Sandia National Labs	213010	Enabling Particulate Materials Processing Science for High-Consequence, Small-Lot Precision Manufacturing	10/1/2018	9/17/2021		0	507,782	507,782
Sandia National Labs	213011	Rapid Three-Dimensional Imaging of Non-Nuclear Components	10/1/2018	9/17/2021		0	609,167	609,167
Sandia National Labs	213013	Automated and Optimal Design of Nonlinear Structures in Contact	10/1/2018	9/17/2021		0	578,736	578,736
Sandia National Labs	213014	Agile 'Lego-Like' Full-System Design with Domain-Decomposition Uncertainty Quantification and Reduced-Order Modeling	10/1/2018	9/17/2021		0	329,348	329,348
Sandia National Labs	213015	Spatially and Temporally Resolved Velocimetry for Hypersonic Flows	10/1/2018	9/17/2021		0	555,292	555,292
Sandia National Labs	213016	Credible Computational Meshes from Ill-Defined Geometries using Deep Machine Learning	10/1/2018	9/17/2021		0	641,815	641,815
Sandia National Labs	213017	Far-Reaching Application, Implication, and Realization of Digital Electronics at the Atomic Limit	10/1/2018	9/17/2021		0	5,424,488	5,424,488
Sandia National Labs	213018	Direct Subsurface Measurements through Precise Micro Drilling	10/1/2018	9/17/2021		0	472,745	472,745

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Sandia National Labs	213019	Forecasting Marine Sediment Properties On and Near the Arctic Shelf with Geospatial Machine Learning	10/1/2018	9/17/2021		0	470,446	470,446
Sandia National Labs	213020	Improved Battery Performance, Safety, and Cycle Lifetime through Engineering Stress at Electrode-Electrolyte Interfaces	10/1/2018	9/18/2020		0	613,102	613,102
Sandia National Labs	213023	Achieving High Detectivity Thermal Sensors using Ultrafast Electron Microscopy	10/1/2018	9/17/2021		0	525,328	525,328
Sandia National Labs	213025	Multimode Metastructures: Novel Hybrid Three-Dimensional Lattice Topologies	10/1/2018	9/17/2021		0	860,665	860,665
Sandia National Labs	213026	Magnetic Field Synthesis at the Nanoscale for Engineered Quantum Materials	10/1/2018	9/17/2021		0	318,666	318,666
Sandia National Labs	213027	High impedance Nanometal-Filled Hybrid Materials for Three-Dimensional-Printed Modular Shields	10/1/2018	9/17/2021		0	838,551	838,551
Sandia National Labs	213030	Fundamental Mechanisms of Friction Evolution in Lamellar Solids	10/1/2018	9/17/2021		0	664,429	664,429
Sandia National Labs	213031	Automated Algorithms for Predicting Trends and Identifying Subpopulations in Neutron Generator Production Data	10/1/2018	9/17/2021		0	299,828	299,828
Sandia National Labs	213032	Enhanced Nuclear Deterrence Through Trusted Fully Integrated Transceiver Architectures and Alternative Data Processing Techniques	10/1/2018	9/17/2021		0	532,049	532,049
Sandia National Labs	213034	Survivable Location System for Post Flight Test Asset Recovery	10/1/2018	9/17/2021		0	591,003	591,003
Sandia National Labs	213035	Enabling Embedded Sensing in Composites through Damage Tolerance	10/1/2018	9/17/2021		0	615,436	615,436
Sandia National Labs	213036	Revolutionizing Weapons-Component Design via Advanced Uncertainty Quantification and Reduced-Order Modeling	10/1/2018	9/17/2021		0	490,118	490,118
Sandia National Labs	213038	Heterogeneous Integration of Compound Semiconductor Technology with Silicon Electronics for Radio Frequency Photonics	10/1/2018	9/17/2021		0	629,230	629,230
Sandia National Labs	213043	Optimization-Based Design for Manufacturing	10/1/2018	9/17/2021		0	640,492	640,492
Sandia National Labs	213047	Aerial Crosspolarized Nuclear Quadrupole Resonance-Nuclear Magnetic Resonance: Buried Explosive Detection From a Safe Distance	10/1/2018	9/18/2020		0	223,988	223,988
Sandia National Labs	213048	A Quantum Analog Coprocessor for Correlated Electron Systems Simulation	10/1/2018	9/18/2020		0	181,162	181,162
Sandia National Labs	213050	Instantaneous Three-Dimensional Temperature Measurements via Ultrafast Laser Spectroscopy with Structured Light	10/1/2018	9/17/2021		0	175,944	175,944
Sandia National Labs	213054	Enhance Coherence Time in Intensely Driven Quantum Systems	10/1/2018	9/18/2020		0	239,742	239,742
Sandia National Labs	213055	Exploring Concepts of Radiation Science and Materials for a Strategically Radiation Hardened 90-nm Complementary metal-oxide-semiconductor Technology	10/1/2018	9/17/2021		0	640,700	640,700
Sandia National Labs	213059	Radiation Hard Nonvolatile Memory and Logic Based on Magnetic Tunnel Junctions	10/1/2018	9/17/2021		0	575,690	575,690
Sandia National Labs	213060	Nanoantenna-Based Chip-Scale Spectroscopy for Massive Size, Weight, and Power Reduction	10/1/2018	9/18/2020		0	440,704	440,704
Sandia National Labs	213061	Gallium Nitride Vacuum Nanoelectronics: A New Platform for Radiation-Hard Devices and Beyond	10/1/2018	9/17/2021		0	827,017	827,017
Sandia National Labs	213062	Leveraging Spin-Orbit Coupling in Germanium/Silicon-Germanium Heterostructures for Quantum Information Transfer	10/1/2018	9/17/2021		0	587,376	587,376
Sandia National Labs	213064	High-Brightness Ultraviolet Lasers for Leap-Ahead National Security Applications	10/1/2018	9/17/2021		0	586,486	586,486

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Sandia National Labs	213065	A Miniaturized Optical Atomic Clock for High Performance Navigation, Communication, and Radar Applications	10/1/2018	9/17/2021		0	596,908	596,908
Sandia National Labs	213066	Digital Logic Gates for Extreme Environment Applications	10/1/2018	9/17/2021		0	771,140	771,140
Sandia National Labs	213068	Joint Analysis of Program Data Representations using Machine Learning for Improved Software Assurance and Development Capabilities	10/1/2018	9/18/2020		0	315,229	315,229
Sandia National Labs	213069	Characterization and Optimization of Building Blocks for Specialized Computing Platforms	10/1/2018	9/17/2021		0	254,877	254,877
Sandia National Labs	213070	Propagating Uncertainties for an Evidence-Based Approach for Cybersecurity	10/1/2018	9/17/2021		0	329,659	329,659
Sandia National Labs	213071	Explicit Uncertainty for Binary Analysis	10/1/2018	9/17/2021		0	388,091	388,091
Sandia National Labs	213075	Quantifying Uncertainty in Graphs ? A Step in Graph Noise Characterization	10/1/2018	9/18/2020		0	317,068	317,068
Sandia National Labs	213076	Ophrys: Using Low Rank Decompositions to Improve Fuzzing Capabilities	10/1/2018	9/18/2020		0	264,423	264,423
Sandia National Labs	213077	Machine Learning for Correlated Intelligence	10/1/2018	9/17/2021		0	308,635	308,635
Sandia National Labs	213079	Cascade Communications	10/1/2018	9/18/2020		0	399,603	399,603
Sandia National Labs	213080	Establishing a Methodology for the Optimal Use of Machine Learning to Identify Radioisotopes from Gamma Spectra for Nuclear Security Applications	10/1/2018	9/18/2020		0	290,368	290,368
Sandia National Labs	213081	Bandwidth Limited Incremental Firmware Update For Improved Quick Responsiveness	10/1/2018	9/18/2020		0	202,754	202,754
Sandia National Labs	213083	Temporally Informed Graph Representations	10/1/2018	9/17/2021		0	314,734	314,734
Sandia National Labs	213084	Developing Better Batteries	10/1/2018	9/18/2020		0	84,101	84,101
Sandia National Labs	213085	Inverse Design of Acoustic Metamaterials for Achieving Chameleon Technologies	10/1/2018	9/18/2020		0	401,259	401,259
Sandia National Labs	213086	Multiple Hypothesis Navigation	10/1/2018	9/18/2020		0	232,203	232,203
Sandia National Labs	213087	Data-Driven, Radiation-Aware, Agile Modeling Approach for Rapid Nuclear Deterrence Design Assessment	10/1/2018	9/17/2021		0	592,288	592,288
Sandia National Labs	213088	A Platform-Independent X-ray Diffraction Diagnostic for Phase Transition Kinetics in Traditional and Synthetic Microstructure Materials	10/1/2018	9/17/2021		0	533,419	533,419
Sandia National Labs	213089	An X-ray Intensity Operations Monitor for In Situ, Temporally-Resolved Spectral Characterization of Saturn Sources	10/1/2018	9/17/2021		0	620,209	620,209
Sandia National Labs	213090	Developing Inductively Driven Diagnostic X-ray Sources to Enable Transformative Radiography and Diffraction Capabilities on Z machine (name of machine)	10/1/2018	9/18/2020		0	329,652	329,652
Sandia National Labs	213091	Advanced Cryogenic Fuel Configurations for Inertial Confinement Fusion Target Concepts	10/1/2018	9/17/2021		0	547,215	547,215
Sandia National Labs	213092	A New Route to Quantum-Scale Structures through a Novel Enhanced Germanium Diffusion Mechanism	10/1/2018	9/17/2021		0	391,479	391,479
Sandia National Labs	213856	The Evolution of Complex Surfaces Examined Molecule by Molecule	10/1/2018	9/17/2021		0	252,074	252,074
Sandia National Labs	213857	Modeling the Nonlinear Rheology of Additive Manufacturing	10/1/2018	9/17/2021		0	247,964	247,964
Sandia National Labs	213859	Imaging Microwave Fields with Sub-Micron Resolution using Nitrogen-Vacancy Centers in Diamond	1/17/2019	9/17/2021		0	246,587	246,587
Sandia National Labs	213871	Science and Engineering of Cybersecurity by Uncertainty quantification and Rigorous Experimentation: An Evidence-Based Approach for Cybersecurity	10/1/2018	9/17/2021		0	2,953,697	2,953,697

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Sandia National Labs	213872	Secure Extreme Environment Embedded Computing	10/1/2018	9/17/2021		0	3,607,990	3,607,990
Sandia National Labs	213941	Anion-Imprinted Porous Polymers for Water Purification and Chemical Detection	10/1/2018	9/17/2021		0	252,578	252,578
Sandia National Labs	214057	Optical Property Sculpting with Phonon Laminates	10/1/2018	9/18/2020		0	231,317	231,317
Sandia National Labs	214103	Multiscale Modeling High-Order Methods, and Data-Driven Modeling	10/15/2018	9/18/2020		0	99,987	99,987
Sandia National Labs	214237	Nanoscale Ion Intercalation Physics in Metal Oxide Materials for Ultra-Low Voltage Memory and Logic Applications	10/25/2018	9/18/2020		0	194,910	194,910
Sandia National Labs	214290	Dynamic Heterogeneity through Nanostructure: Tough, High Glass Transition Temperature Thermosets Cured under Mild Conditions	10/1/2018	9/17/2021		0	364,234	364,234
Sandia National Labs	214441	Scalable Firmware Emulation	11/13/2018	9/17/2021		0	504,873	504,873
Sandia National Labs	214546	Modeling a High-Performance, Low Power Onboard Analog Neural Algorithm Processing Unit	10/1/2018	9/17/2021		0	289,171	289,171
Sandia National Labs	214802	Measuring Aging Related Degradation in Integrated Circuits	12/12/2018	9/17/2021		0	376,006	376,006
Sandia National Labs	214973	Dual Light Source Microscopy	1/9/2019	9/18/2020		0	330,669	330,669
Sandia National Labs	215205	The Engineered Single Guide Ribonucleic acid Structure as a Biomarker for Gene-editing Reagent Exposure	2/5/2019	9/17/2021		0	223,638	223,638
Sandia National Labs	215348	Local Limits of Detection for Anthropogenic Aerosol-Cloud Interactions	2/21/2019	9/17/2021		0	289,572	289,572
Sandia National Labs	215596	Corrosion Chemistry at Buried Interfaces	2/28/2019	9/18/2020		0	144,768	144,768
Sandia National Labs	215861	Development of Cognitive Analytics for Improved Satellite Security	3/20/2019	9/17/2021		0	561,665	561,665
Sandia National Labs	215863	Moving Target Defense for Space Systems	3/20/2019	9/17/2021		0	576,333	576,333
Sandia National Labs	215864	A Novel Processing Method to Achieve Latch-Up Immunity in Advanced Complementary Metal-Oxide Semiconductor Technologies	3/20/2019	9/17/2021		0	238,686	238,686
Sandia National Labs	215957	Anomaly Detection for Physical Security: Nonlinear Dimension Reduction for Heterogeneous Temporal Data	3/27/2019	9/18/2020		0	157,221	157,221
Sandia National Labs	216057	Response of Gallium Nitride-based Semiconductor Devices to Ion and Neutron Irradiation	4/1/2019	9/18/2020		0	154,618	154,618
Sandia National Labs	216061	Obtaining Operational Semantic Vectors for Networks	4/1/2019	9/18/2020		0	157,747	157,747
Sandia National Labs	216063	Tailored Multi-Principal Element Alloys Toward Improved Functional Properties	4/1/2019	9/18/2020		0	158,131	158,131
Sandia National Labs	216149	In Vacuo Heating Experiments on Mykonos: A Path Forward to Improving Power Flow on Z machine (name of machine)	4/10/2019	9/18/2020		0	195,291	195,291
Sandia National Labs	216221	Conception and Preliminary Technical Analysis of Unique Signal Pattern Discriminating Microsystems	4/15/2019	9/17/2021		0	435,242	435,242
Sandia National Labs	216395	Noisy, Intermediate-Scale Quantum Applications on a Pathfinder System	4/25/2019	9/18/2020		0	209,231	209,231
Sandia National Labs	216839	Development and use of an Ultra High Resolution Electron Scattering Apparatus	6/17/2019	9/17/2021		0	331,856	331,856
Sandia National Labs	216987	Ultrafast Electron Microscopy for Spatial-Temporal Mapping of Charge Carriers in Gallium Nitride Devices	6/4/2019	9/17/2021		0	239,318	239,318
Sandia National Labs	218239	Partitioning of Complex Fluids at Mineral Surfaces	10/1/2019	9/18/2020		0	339,144	339,144
Sandia National Labs	218241	A Flexible, Highly Scalable, Configurable Neuromorphic Architecture	7/29/2019	9/18/2020		0	231,485	231,485
Sandia National Labs	218242	Development of Single Photon Sources in Gallium Nitride	10/1/2019	9/23/2022		0	435,278	435,278
Sandia National Labs	218253	Customized Lithium Batteries for Mission Applications	10/1/2019	9/23/2022		0	3,496,615	3,496,615

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Sandia National Labs	218254	Dislocation Cell-Wall Formation in Deformed Structural Metals: Untangling the Theory of Low Energy Dislocation Structures	10/1/2019	9/17/2021		0	308,745	308,745
Sandia National Labs	218255	Stress Intensity Thresholds for Development of Reliable Brittle Materials	10/1/2019	9/23/2022		0	418,694	418,694
Sandia National Labs	218256	Uncovering the Mechanistic Origins of Atmospheric Corrosion Damage with High-Throughput Four-Dimensional Materials Science and Deep Learning	10/1/2019	9/23/2022		0	660,909	660,909
Sandia National Labs	218258	Development of a New Experimental Method for Correlated Operando Surface/Gas Characterization	10/1/2019	9/17/2021		0	415,218	415,218
Sandia National Labs	218259	Proton-Tunable Analog Transistor for Low-Power Computing	10/1/2019	9/23/2022		0	518,620	518,620
Sandia National Labs	218260	Using Machine Learning to go Beyond the Darken Equations in Predicting Diffusion in Multicomponent Mixtures	10/1/2019	9/23/2022		0	390,639	390,639
Sandia National Labs	218261	Towards Heteroepitaxial Control of the Non-Trivial Phases of Topological Quantum Materials	10/1/2019	9/23/2022		0	320,669	320,669
Sandia National Labs	218262	Response of Solid Electrolytes in Thermal Environments	10/1/2019	9/18/2020		0	308,841	308,841
Sandia National Labs	218263	Investigating the Origin(s) of Radiation Tolerance in Thermally-Stable Chalcogenide Phase Change Memory Materials	10/1/2019	9/18/2020		0	408,185	408,185
Sandia National Labs	218264	Opening the "Black Box": An Experimentally-Validated Explainable Machine Learning Framework for Materials Design and Discovery	10/1/2019	9/23/2022		0	479,928	479,928
Sandia National Labs	218265	Manipulation of Hole Spin Transport in Germanium	10/1/2019	9/17/2021		0	161,876	161,876
Sandia National Labs	218266	Smart Materials for Highly Complex Optical Tags with Environmental Response	10/1/2019	9/23/2022		0	562,949	562,949
Sandia National Labs	218267	Understanding the Structural Evolution of Amorphous Materials with Applications in Additive Manufacturing and Joining Processes	10/1/2019	9/23/2022		0	216,130	216,130
Sandia National Labs	218268	Unsupervised Learning Algorithms for Autonomous Trajectory Analysis	10/1/2019	9/17/2021		0	377,551	377,551
Sandia National Labs	218269	Hyper-Differential Analysis to Mitigate Uncertainties for Control of Hypersonic Vehicles	10/1/2019	9/23/2022		0	564,788	564,788
Sandia National Labs	218270	Improving Model-Based Training of Automatic Target Recognition for Rapidly Responding to Evolving Threats	10/1/2019	9/17/2021		0	317,458	317,458
Sandia National Labs	218271	Tightly Integrated Navigation and Guidance for Target Acquisition	10/1/2019	9/23/2022		0	499,307	499,307
Sandia National Labs	218272	Justification and Transparency in Synthetic Aperture Radar Automatic Target Recognition using Artificial Intelligence Rule Extraction and Fused Classification	10/1/2019	9/17/2021		0	527,447	527,447
Sandia National Labs	218273	Real-Time Evasive Maneuvers in Contested, Uncertain Environments	10/1/2019	9/23/2022		0	653,694	653,694
Sandia National Labs	218274	Real-Time, Nonlinear, Optimization-Based Control Algorithms for Hypersonic Aircraft	10/1/2019	9/17/2021		0	332,262	332,262
Sandia National Labs	218275	Hypersonic Wind Tunnel Test Bed for Fault-Tolerant and Adaptive Control	10/1/2019	9/23/2022		0	775,504	775,504
Sandia National Labs	218276	Autonomous Real-Time Rapid 6-Degree-of-Freedom Trajectory Generation for Highly Constrained Hypersonic Missions	10/1/2019	9/17/2021		0	437,951	437,951
Sandia National Labs	218277	Surrogate-Constrained Vehicle Modeling to Enable Rapid and Real-Time Trajectory Generation	10/1/2019	9/17/2021		0	307,065	307,065
Sandia National Labs	218305	Inducing Self-Destruction of Bacterial Pathogens	10/1/2019	9/18/2020		0	102,306	102,306
Sandia National Labs	218306	Engineering ribulose biphosphate carboxylase/oxygenase for Food Security	10/1/2019	9/18/2020		0	106,283	106,283

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Sandia National Labs	218307	Synthetic Microbial Consortium for Biological Breakdown and Conversion of Lignin to Valuable Chemicals and Fuels in Support of Sandia's National Security Challenges in Biomass Energy Diversification	10/1/2019	9/23/2022		0	535,597	535,597
Sandia National Labs	218308	Clustered Regularly Interspaced Short Palindromic Repeats Efficiency Prediction Based on Chromatin State and Gene Function	10/1/2019	9/18/2020		0	108,134	108,134
Sandia National Labs	218309	Reconfiguration of Respiratory Tract Microbiomes to Prevent and Treat Burkholderia Infection	10/1/2019	9/23/2022		0	685,014	685,014
Sandia National Labs	218310	A Method to Amplify and Collect Bio Volatiles for Wearable Monitors	10/1/2019	9/18/2020		0	172,727	172,727
Sandia National Labs	218311	Microfluidic Platform for Single-Cell Dual Ribonucleic Acid Sequencing of Host-Pathogen Interactions	10/1/2019	9/17/2021		0	309,985	309,985
Sandia National Labs	218312	Domain-Informed Machine Learning: Designing Analytics Around Human Expertise	10/1/2019	9/18/2020		0	265,363	265,363
Sandia National Labs	218313	Subspace-Adaptive Variational Inference for Credible Prediction Uncertainty Quantification	10/1/2019	9/18/2020		0	304,947	304,947
Sandia National Labs	218314	Adapting Secure MultiParty Computation to Support Machine Learning in Radio Frequency Sensor Networks	10/1/2019	9/17/2021		0	433,474	433,474
Sandia National Labs	218315	Integrating Physics Knowledge in Multi-Sensor Machine Learning Models	10/1/2019	9/18/2020		0	328,257	328,257
Sandia National Labs	218316	Assessing Cognitive Impacts of Errors from Machine Learning and Deep Learning Models	10/1/2019	9/17/2021		0	421,200	421,200
Sandia National Labs	218317	Learning Hidden Structure in Multifidelity Information Sources for Efficient Uncertainty Quantification	10/1/2019	9/18/2020		0	486,869	486,869
Sandia National Labs	218318	Mathematical Foundations for Nonlocal Interface Problems: Multiscale Simulations of Heterogeneous Materials	10/1/2019	9/23/2022		0	451,147	451,147
Sandia National Labs	218319	Accelerating Multiscale Materials Modeling with Machine Learning	10/1/2019	9/23/2022		0	538,927	538,927
Sandia National Labs	218320	Particle Sensitivity Analyses	10/1/2019	9/18/2020		0	340,369	340,369
Sandia National Labs	218321	Verification of Data-Driven Models of Physical Phenomena using Interpretable Approximations	10/1/2019	9/17/2021		0	467,618	467,618
Sandia National Labs	218322	Fluid-Kinetic Coupling: Advanced Discretizations for Simulations on Emerging Heterogeneous Architectures	10/1/2019	9/23/2022		0	373,984	373,984
Sandia National Labs	218323	Adaptive Space-Time Methods for Large Scale Optimal Design	10/1/2019	9/23/2022		0	197,752	197,752
Sandia National Labs	218324	Potential Energy Surfaces that Rise to the Challenge: Designing Simulation Models to Solve the Next Generation of Problems of Soft Matter	10/1/2019	9/23/2022		0	229,606	229,606
Sandia National Labs	218325	Physically Rigorous Reduced-Order Flow Models of Fractured Subsurface Environments without Explosive Computational Cost	10/1/2019	9/23/2022		0	488,529	488,529
Sandia National Labs	218326	Predicting Gas Transport in the Subsurface	10/1/2019	9/23/2022		0	316,930	316,930
Sandia National Labs	218327	Seismic Spatial Gradients as a Machine Learning-Based Classifier for Explosion Monitoring	10/1/2019	9/17/2021		0	251,829	251,829
Sandia National Labs	218328	Computational Analysis of Coupled Geoscience Processes in Fractured and Deformable Media	10/1/2019	9/23/2022		0	516,388	516,388
Sandia National Labs	218329	Uncertainty Quantification of Geophysical Inversion Using Stochastic Partial Differential Equations	10/1/2019	9/17/2021		0	485,059	485,059
Sandia National Labs	218330	Releasing, Detecting, and Modeling Trace Aerosols and Gases in Earth's Stratosphere	10/1/2019	9/23/2022		0	663,197	663,197
Sandia National Labs	218331	Low-Power Inference for Self-Driving Vehicles via Iterative Activations and Low-Precision Weights	10/1/2019	9/18/2020		0	100,727	100,727

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Sandia National Labs	218332	Aero Motionless Integrated Extraction for Distributed Wind Power in the Arctic and Alaska	10/1/2019	3/31/2021		0	176,818	176,818
Sandia National Labs	218333	Unmanned Aerial Systems Air-to-Air Controlled Kill	10/1/2019	9/18/2020		0	82,630	82,630
Sandia National Labs	218334	Enabling Ultra-Low Power Neuromorphic Computing by Modeling the Electronic Structure Evolution of Charge Tunable Ion-Insertion Materials	10/1/2019	9/18/2020		0	99,067	99,067
Sandia National Labs	218335	Designing Catalysts for Dehydrogenation of Methane for Reducing Green House Gas Emission during Natural Gas Extraction	8/13/2019	9/18/2020		0	126,900	126,900
Sandia National Labs	218336	Data Architectures for Timely Security Monitoring. Moving Past American Standard Code for Information Interchange Logs	10/1/2019	9/18/2020		0	548,527	548,527
Sandia National Labs	218337	Malware Generation with Specific Behaviors to Improve Machine Learning-based Detectors	10/1/2019	9/23/2022		0	461,155	461,155
Sandia National Labs	218338	Detecting Unknown Cyber Attacks using Bayesian Networks	10/1/2019	9/23/2022		0	361,090	361,090
Sandia National Labs	218339	Critical Infrastructure Malware Payload Detection using Virtual Machine Introspection-assisted Symbolic Exploration	10/1/2019	9/23/2022		0	432,194	432,194
Sandia National Labs	218340	Development of Ribonucleic Acid Targeting CRISPR Systems and Primary-like Cell Arrays for Rapid and Accurate Assessment of Emerging Editing and Delivery Technologies	10/1/2019	9/23/2022		0	403,764	403,764
Sandia National Labs	218341	Field-Deployable Platform for Comprehensive Clustered Regularly Interspaced Short Palindromic Repeats Detection and Characterization	10/1/2019	9/23/2022		0	300,802	300,802
Sandia National Labs	218342	Resilience Enhancements through Deep Learning Yields	10/1/2019	9/23/2022		0	476,454	476,454
Sandia National Labs	218343	Development of Power System Models for Optimal Grid Restoration Subject to Intentional Threats	10/1/2019	9/23/2022		0	329,289	329,289
Sandia National Labs	218344	Dynamics-Informed Optimization for Resilient Energy	10/1/2019	9/23/2022		0	468,386	468,386
Sandia National Labs	218345	Signal-Based Fast Tripping Protection Schemes for Electric Power Distribution System Resilience	10/1/2019	9/23/2022		0	711,497	711,497
Sandia National Labs	218346	Energy Packet Based Power Systems for High Penetration Renewables	10/1/2019	9/23/2022		0	354,809	354,809
Sandia National Labs	218347	Developing Novel Liquid Metal Solution Chemistry that Combines Thermochemical and Electrochemical Processes to Produce Renewable Hydrogen by Water Splitting	10/1/2019	9/23/2022		0	409,727	409,727
Sandia National Labs	218348	Overcoming Wave Energy Converter Grid Integration Challenges: Coupling Wave Forecasting, Wave Energy Converter Array Controls, and Power Production	10/1/2019	9/23/2022		0	354,829	354,829
Sandia National Labs	218349	An Adaptive and Scalable Meshfree Framework for Extreme Deformation and Failure in Solids	10/1/2019	9/18/2020		0	204,909	204,909
Sandia National Labs	218350	Shape Optimization for Control and Isolation of Structural Vibrations in Aerospace and Defense Applications	10/1/2019	9/18/2020		0	124,970	124,970
Sandia National Labs	218351	A New Paradigm for Failure Prediction Using Four-Dimensional Materials Science and Deep Learning	10/1/2019	9/18/2020		0	229,742	229,742
Sandia National Labs	218352	Novel Approaches for Modeling Aluminum Melt and Relocation Supporting Weapon Safety Assessments	7/31/2019	9/18/2020		0	425,133	425,133
Sandia National Labs	218353	Detonation in Multilayer Explosives - Effects of the Characteristic Length Scale of Mixing	10/1/2019	9/23/2022		0	340,604	340,604
Sandia National Labs	218354	Multiscale Approach to Fast Modeling and Simulation for Laser Processing of Metals for Future Nuclear Deterrence Environments	10/1/2019	9/18/2020		0	139,454	139,454

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Sandia National Labs	218355	Rapid Stronglink Mechanisms Computer Aided Design - to-Simulation-Ready Models with Machine Learning	10/1/2019	9/23/2022		0	149,388	149,388
Sandia National Labs	218356	Understanding the Coupling Between Heat Generation and Mechanical Work in Large Deformation Plasticity	10/1/2019	9/23/2022		0	514,001	514,001
Sandia National Labs	218357	Comprehensive Uncertainty Quantification for Full Engineering Models by Solving Probability Density Function Equations	10/1/2019	9/23/2022		0	390,331	390,331
Sandia National Labs	218358	Development of a Capability to Perform Simultaneous Combined Hostile Shock and Random Vibration Mechanical Environments Testing	10/1/2019	9/18/2020		0	95,258	95,258
Sandia National Labs	218359	High-Speed Diagnostic and Simulation Capabilities for Reacting Hypersonic Reentry Flows	10/1/2019	9/23/2022		0	696,736	696,736
Sandia National Labs	218360	Advancing Structural Dynamics Capabilities with Nonlinear Modal Analysis	10/1/2019	9/23/2022		0	660,916	660,916
Sandia National Labs	218361	Stress Birth and Death: Disruptive Computational Mechanics and Novel Diagnostics for Fluid-to-Solid Transitions	10/1/2019	9/23/2022		0	641,184	641,184
Sandia National Labs	218362	Regression Based Approach for Robust Finite Element Analysis on Arbitrary Grids	10/1/2019	9/18/2020		0	202,619	202,619
Sandia National Labs	218368	Understanding Anomalies in New Infrared Materials and Devices	10/1/2019	9/17/2021		0	277,274	277,274
Sandia National Labs	218369	Microplasma-Enabled Radio Frequency and Microwave Control Components	10/1/2019	9/23/2022		0	542,697	542,697
Sandia National Labs	218370	Chemical Vapor Deposition Technologies to Adapt Sandia's Radio Frequency Resonator Devices for Ubiquitous Chemical Monitoring Applications	10/1/2019	9/23/2022		0	514,109	514,109
Sandia National Labs	218372	Fin Ion Tunable Transistor for Ultra Low Power Computing	10/1/2019	9/23/2022		0	438,949	438,949
Sandia National Labs	218373	Reconfigurable Unpatterned Metasurfaces via Acoustoelectric Gating of Graphene	10/1/2019	9/23/2022		0	636,273	636,273
Sandia National Labs	218374	Silicon Photonic Transceivers for Continuous Variable Quantum Key Distribution	10/1/2019	9/18/2020		0	176,284	176,284
Sandia National Labs	218375	Single Photon Detection with On-Chip Number Resolving Capability	10/1/2019	9/23/2022		0	695,468	695,468
Sandia National Labs	218376	Beyond the Data Center: Heterointegrated Optics for Extreme Environments	10/1/2019	9/18/2020		0	242,929	242,929
Sandia National Labs	218378	Analyzing Custom Proof Masses and Quantum Limits of a Manufacturable Cavity Optical Levitation Solution	10/1/2019	9/18/2020		0	189,940	189,940
Sandia National Labs	218379	Electromagnetic Interference and Coupling in Nanoscale Systems	10/1/2019	9/23/2022		0	330,934	330,934
Sandia National Labs	218380	Phononic Memory and Transduction using Nano-Optomechanics: Hardware Accelerators for Quantum Computers	10/1/2019	9/23/2022		0	485,426	485,426
Sandia National Labs	218381	ARM® Secure Monitor Mode Based Debugger	10/1/2019	9/17/2021		0	400,935	400,935
Sandia National Labs	218382	Sensitivity Analysis Guided Explainability for Machine Learning Intrusion Detection System	10/1/2019	9/17/2021		0	459,950	459,950
Sandia National Labs	218383	A Rapid, Phage-Based Screening Platform to Identify and Counter High Risk Bacterial Pathogens	10/1/2019	9/18/2020		0	112,836	112,836
Sandia National Labs	218384	Deformation-Induced Helium Platelet Behavior as a Possible Helium Release Mechanism in Metal Tritides	10/1/2019	9/18/2020		0	92,277	92,277
Sandia National Labs	218385	Molecule Origins of Dipolar Character in Excited Electronic States	7/1/2019	9/18/2020		0	89,653	89,653
Sandia National Labs	218386	Multimodal Data Fusion via Neural Network Entropy Minimization	10/1/2019	9/18/2020		0	101,472	101,472

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Sandia National Labs	218387	Revolutionary Thermal Interface Cooling for Space Systems	10/1/2019	9/17/2021		0	290,477	290,477
Sandia National Labs	218388	Improved Low-Signal-to-Noise Detection and Tracking with Three-Dimensional Physical Constraint Models	10/1/2019	9/18/2020		0	149,992	149,992
Sandia National Labs	218389	Three-Dimensional Reconstruction of Remote Sensing Imagery from Diverse Sensors	10/1/2019	9/23/2022		0	203,024	203,024
Sandia National Labs	218390	Semi-Supervised Bayesian Low-Shot Learning for Explosive Device Characterization	10/1/2019	9/17/2021		0	321,261	321,261
Sandia National Labs	218391	Short-Wave Infrared Augmented Goggles	10/1/2019	9/17/2021		0	390,547	390,547
Sandia National Labs	218392	Signature Modeling of Energetic and Nuclear Events for Remote Sensing Detection and Characterization	10/1/2019	9/23/2022		0	400,261	400,261
Sandia National Labs	218393	Low-Dark-Current Extended-Short-Wave Detectors Using Quaternary Antimonide Alloys	10/1/2019	9/23/2022		0	280,269	280,269
Sandia National Labs	218394	Detection of Anomalous Maritime Vessels through Unsupervised Learning Techniques	10/1/2019	9/17/2021		0	367,239	367,239
Sandia National Labs	218395	Extremely Lightweight Optical Structures for Rapid Deployment	10/1/2019	9/17/2021		0	352,487	352,487
Sandia National Labs	218396	Low Size, Weight, and Power Tunable Hyperspectral Video Imager	10/1/2019	9/17/2021		0	365,216	365,216
Sandia National Labs	218397	Synthetic Data for Rapid Use of Machine Learning	10/1/2019	9/18/2020		0	163,811	163,811
Sandia National Labs	218398	Leveraging Physical Models and Variational Autoencoders to Enable Deep Learning Classification of Sparse Datasets for Global Security Applications	10/1/2019	9/18/2020		0	64,745	64,745
Sandia National Labs	218399	Developing a Resilient, Adaptive, and Systematic Paradigm for Security Analysis	10/1/2019	9/17/2021		0	204,175	204,175
Sandia National Labs	218400	Assessment and Mitigation of Vulnerabilities Associated with Human Performance in High-Consequence, Low-Probability Threat Environments	10/1/2019	9/17/2021		0	407,927	407,927
Sandia National Labs	218401	How Low Can You Go? Using Synthetic Three-Dimensional Imagery to Drastically Reduce Real-World Training Data for Object Detection	10/1/2019	9/18/2020		0	175,216	175,216
Sandia National Labs	218402	Fundamentals of Airborne Manipulation for Radically Improved Hazardous Object Exploration and Remediation	7/25/2019	9/18/2020		0	105,739	105,739
Sandia National Labs	218403	Characterizing Shielded Special Nuclear Material by Neutron Capture Gamma Multiplicity Counting	7/30/2019	9/18/2020		0	172,960	172,960
Sandia National Labs	218404	Experimental Demonstration of a Meissner-Effect Transition-Edge-Sensor for Gamma-Ray Detection and Spectroscopy	10/1/2019	9/18/2020		0	168,409	168,409
Sandia National Labs	218405	Investigation of Microcalorimeter Photon Detector Performance to Enable use in Nonproliferation Applications	10/1/2019	9/23/2022		0	351,953	351,953
Sandia National Labs	218406	Time Reversal Acoustics	10/1/2019	9/18/2020		0	144,742	144,742
Sandia National Labs	218407	Design of Next Generation Physical Protection Systems for Transporting of High Value Assets	10/1/2019	9/23/2022		0	310,611	310,611
Sandia National Labs	218408	Computational Imaging for Intelligence in Highly Scattering Aerosols	10/1/2019	9/23/2022		0	471,113	471,113
Sandia National Labs	218412	Enhanced Characterization via Optical Resonances	10/1/2019	9/17/2021		0	246,647	246,647
Sandia National Labs	218413	Infinite Lifetime Power Technologies Based on Technetium-99	10/1/2019	9/23/2022		0	239,207	239,207
Sandia National Labs	218414	Composite Inorganic/Organic Neutron and Gamma-ray Radiation Detection System	10/1/2019	9/17/2021		0	354,151	354,151
Sandia National Labs	218416	All-Source Intelligence Reconciliation through Intermediate Symbolic Representations and Computational Graphical Models	10/1/2019	9/17/2021		0	139,831	139,831
Sandia National Labs	218417	Robust Solid State Solutions for Gamma Sensing	10/1/2019	9/17/2021		0	367,618	367,618

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Sandia National Labs	218418	Portable Microdevice to Measure Isotopic Ratios	10/1/2019	9/23/2022		0	284,459	284,459
Sandia National Labs	218419	The Enigma	10/1/2019	9/17/2021		0	316,492	316,492
Sandia National Labs	218423	High-Security Edge Computing for Smart Sensor Systems	10/1/2019	9/18/2020		0	335,413	335,413
Sandia National Labs	218425	Demonstration of Phase Locking in Gigawatt Class High Power Microwave Systems with a Low Amplitude Injected Signal	10/1/2019	9/23/2022		0	336,807	336,807
Sandia National Labs	218426	Aluminum Nitride -Alloyed-Based Wideband Multiplexers for Spectrum Situational Awareness	10/1/2019	9/23/2022		0	443,100	443,100
Sandia National Labs	218427	Multi-Polarization Ephemeral Feature Discrimination, Detection, and Extraction	10/1/2019	9/23/2022		0	212,143	212,143
Sandia National Labs	218428	Twitcher: Motor Dither Correlation for the Survival of Global Navigation Satellite System Spoofing Attacks	10/1/2019	9/23/2022		0	453,704	453,704
Sandia National Labs	218429	A Femto Tesla-Sensitive Magnetometer for Very Low Frequency and Low Frequency Detection	10/1/2019	9/23/2022		0	347,572	347,572
Sandia National Labs	218430	Tactical Microscale Optomechanical Gyroscopes Enabled by Heterointegration of Lasers and Ultrahigh Quality Factor Oscillators	10/1/2019	9/17/2021		0	264,248	264,248
Sandia National Labs	218431	Advanced Digital Multi-Mission Aperture Enabling Beam-Agile Radio Frequency Sensing	10/1/2019	9/23/2022		0	458,036	458,036
Sandia National Labs	218432	Predictive Imaging from Bodies at Extreme Speeds	10/1/2019	9/23/2022		0	427,047	427,047
Sandia National Labs	218433	Miniature Programmable Delay Element for Electronic Warfare and Tagging, Tracking, and Locating Applications	10/1/2019	9/23/2022		0	460,283	460,283
Sandia National Labs	218435	Femto-Second Imaging Camera System Based on III-Nitride Metasurfaces	10/1/2019	9/23/2022		0	221,073	221,073
Sandia National Labs	218436	Neuromorphic Information Processing by Optical Media	10/1/2019	9/23/2022		0	295,449	295,449
Sandia National Labs	218437	Exploring the Design Space in a Responsive, Tunable Materials Platform for potential of hydrogen -dependent Endosomal Release within Cells	10/1/2019	9/17/2021		0	226,544	226,544
Sandia National Labs	218438	A Fast-Cycle Charge Noise Measurement for Better Qubits	10/1/2019	9/17/2021		0	195,438	195,438
Sandia National Labs	218439	High Temperature Superconductivity in Ambient Pressure Hydrogen Materials	10/1/2019	9/17/2021		0	172,851	172,851
Sandia National Labs	218440	Physiological Characterization of Language Comprehension	10/1/2019	9/17/2021		0	168,537	168,537
Sandia National Labs	218441	Toward Agile Qualification: Leveraging Uncertainty Quantification from Past Computer Simulation Analyses to Support New Applications	10/1/2019	9/23/2022		0	441,675	441,675
Sandia National Labs	218442	Flexible Storage of Hydrogen Isotopes	10/1/2019	9/23/2022		0	456,384	456,384
Sandia National Labs	218443	Deep Learning for Defect Detection in High-Reliability Components	10/1/2019	9/23/2022		0	324,642	324,642
Sandia National Labs	218444	Advanced Manufacturing Techniques of Thermoelectric Modules	10/1/2019	9/23/2022		0	384,536	384,536
Sandia National Labs	218445	Reduction/Oxidation Switch Enablement Technology	10/1/2019	9/23/2022		0	484,983	484,983
Sandia National Labs	218446	Secure, Flexible Communications and Power Distribution in an Advanced Barriers Paradigm	10/1/2019	9/23/2022		0	532,304	532,304
Sandia National Labs	218447	Novel Methods for Optimizing Neutron Tube Performance	10/1/2019	9/23/2022		0	219,771	219,771
Sandia National Labs	218448	Development and Use of Electromagnetic Resonance Dampeners to Improve Cavity Shielding Effectiveness and Circuit Operation	10/1/2019	9/23/2022		0	500,741	500,741
Sandia National Labs	218449	Trusted Microelectronics Enabling Secure Monitoring and Updates	10/1/2019	9/23/2022		0	433,666	433,666

Site Name	Project ID	Project Name 2020	Start Date	Complete Date	Over 3 Years Explanation	MIE	Other Costs	Total Costs
Sandia National Labs	218450	A Multi-Wavelength Optical Transceiver Chipset for Telemetry and Mission Busses over the Same Infrastructure	10/1/2019	9/23/2022		0	462,377	462,377
Sandia National Labs	218451	Quantifying Thermal Output of Energetic Materials: Advanced Optical Diagnostics and Predictive Models	10/1/2019	9/23/2022		0	608,705	608,705
Sandia National Labs	218452	Predictive, Agile Reentry Tools: Pyrolysis and Transpiration	10/1/2019	9/23/2022		0	799,647	799,647
Sandia National Labs	218454	Quantum-Accurate Multiscale Modeling of Shock Hugoniot, Ramp Compression Paths, Structural and Magnetic Phase Transitions, and Transport Properties in Highly Compressed Metals	10/1/2019	9/23/2022		0	305,194	305,194
Sandia National Labs	218455	Impact of Neutron Energy and Angle on Microelectronics? Single Event Upset Performance in Nuclear Weapon Environments	10/1/2019	9/18/2020		0	275,774	275,774
Sandia National Labs	218456	Improving Predictive Capability in Radiation, Electrical, and High Energy Density Science Simulations with Fast, Accurate, and Consistent Non-Equilibrium Material Properties	10/1/2019	9/23/2022		0	457,377	457,377
Sandia National Labs	218466	Ultra-Broadband, High Dynamic Range, Integrated Photonic Electromagnetic Probe	10/1/2019	9/18/2020		0	197,988	197,988
Sandia National Labs	218467	Diagnosing Field Strengths and Plasma Conditions in Magnetically Insulated Transmission Lines Using Active Dopant Spectroscopy	7/29/2019	9/18/2020		0	281,621	281,621
Sandia National Labs	218468	Next Generation Uncertainty Quantification and Stochastic Media Monte Carlo Transport Methods	10/1/2019	9/23/2022		0	557,877	557,877
Sandia National Labs	218469	Absolute High-Resolution Photoelectron Spectra for Validation of Extending Capabilities in Radiation Transport Modeling	10/1/2019	9/17/2021		0	214,850	214,850
Sandia National Labs	218470	Development of a Novel Electrical Characterization Technique for Measuring Hidden Joint Contacts in Weapons Cavities	10/1/2019	9/23/2022		0	355,695	355,695
Sandia National Labs	218471	Combined Environments on Z Machine (name of machine)	10/1/2019	9/18/2020		0	351,784	351,784
Sandia National Labs	218473	Reactive Molecular Dynamics in High Field Environments for Understanding Plasma Current Loss on Z Machine (name of machine)	10/1/2019	9/17/2021		0	179,560	179,560
Sandia National Labs	218474	Physics-Informed, Rapid and Automated Machine-learning for compact model Development	10/1/2019	9/23/2022		0	636,293	636,293
Sandia National Labs	218475	Multiphysics Design of Barrier Enclosures using Partial Differential Equation-Constrained Optimization	10/1/2019	9/23/2022		0	531,486	531,486
Sandia National Labs	218476	Multiphysics Optimization Tool for Exploration of Resilient Agile Deterrence Designs	10/1/2019	9/23/2022		0	167,776	167,776
Sandia National Labs	218477	Functionally Graded Metallic Composites to Enable Tailored Interfacial Properties	10/1/2019	9/23/2022		0	713,794	713,794
Sandia National Labs	218479	Development of a Finite Element Methodology for the Prediction of Ultra-High Frequency Wave Propagation	10/1/2019	9/17/2021		0	515,176	515,176
Sandia National Labs	218485	Survivable Interfaces for Barrier Design	10/1/2019	9/17/2021		0	462,919	462,919
Sandia National Labs	218488	Capability Development for Prediction and Optimization of Engineered Anisotropic Thermal Barriers	10/1/2019	9/18/2020		0	194,028	194,028
Sandia National Labs	218489	Multiphysics Metamaterials	10/1/2019	9/17/2021		0	517,718	517,718
Sandia National Labs	218490	Rapid Physics-Informed Survivability Assessment	10/1/2019	9/17/2021		0	491,948	491,948
Sandia National Labs	218491	Pixelated Optical Shutters for Through-Attack Imaging	10/1/2019	9/23/2022		0	179,708	179,708

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Sandia National Labs	218492	Reactive Threat Fight/Flight Response Adaptive Control Architecture for Resilient/Survival Satellite System Operations	10/1/2019	9/23/2022		0	272,354	272,354
Sandia National Labs	218493	Adaptive Intrusion Response for Space Systems	10/1/2019	9/23/2022		0	373,890	373,890
Sandia National Labs	218494	Electromagnetic Threat Resilience using a Protective Faraday Cage with Mechanical Transduction for Communications and Power Transmission	10/1/2019	9/23/2022		0	181,619	181,619
Sandia National Labs	218495	Pixelated Micro-Electromechanical System -Tunable Optical Elements for Focal Plane Array Functionality And Resilience	10/1/2019	9/23/2022		0	196,584	196,584
Sandia National Labs	218496	Design of a Tunable Plasmonic Optical Shield for Satellite Focal Plane Arrays	10/1/2019	9/23/2022		0	223,692	223,692
Sandia National Labs	218560	Unmanned Aerial Systems Neutralization Using Disintegrating Bullets	10/1/2019	9/18/2020		0	165,716	165,716
Sandia National Labs	218561	Advanced Multi-Functional Multi-Layer Barrier Concepts	10/1/2019	9/17/2021		0	658,499	658,499
Sandia National Labs	218971	Noise Erasure in Quantum-Limited Current Amplifiers	10/29/2019	9/18/2020		0	147,154	147,154
Sandia National Labs	218972	Hunting for Anomalous Structures in Blockchain Transactions	10/29/2019	9/18/2020		0	99,729	99,729
Sandia National Labs	218973	Neuromorphic Processing and Sensing for Interception	10/29/2019	9/18/2020		0	96,383	96,383
Sandia National Labs	218974	Development of a Photoacoustic Communication Scheme	10/29/2019	9/18/2020		0	44,821	44,821
Sandia National Labs	218975	Acoustoelectric Effect with Guided Acoustic Waves to Reconfigure Radio Frequency Front Ends Susceptible to Jamming, Interference, and Intercept	10/29/2019	9/18/2020		0	95,174	95,174
Sandia National Labs	219008	Quantum-Enabled Bioimaging using a Multipartite Entangled Light Source	10/29/2019	9/18/2020		0	114,155	114,155
Sandia National Labs	219009	Metasurface Objective Lens for Precision Fluorescence Microscopy	10/29/2019	9/18/2020		0	55,311	55,311
Sandia National Labs	219010	Understanding Microstructural Effects on Dynamic Performance Towards the Development of Shock Metamaterials	10/29/2019	9/18/2020		0	124,695	124,695
Sandia National Labs	219026	Temporal Upsampling Using Jittered Multi-Spectral Bands	10/31/2019	9/18/2020		0	68,495	68,495
Sandia National Labs	219027	Tunable Negative Thermal Expansion Filler Materials for Photovoltaic Backsheets	10/31/2019	9/18/2020		0	99,822	99,822
Sandia National Labs	219029	Phase Change Material Based Low Energy Reprogrammable Photonic Switches	10/31/2019	9/18/2020		0	84,580	84,580
Sandia National Labs	219030	Growth of High-Efficiency Gallium Indium Arsenide Antimonide Laser Diodes for Satellite-to-Ground Communications	10/31/2019	9/18/2020		0	92,909	92,909
Sandia National Labs	219031	Extraction of National Security Critical Metals from Shale and Coal Ash using Modified Supercritical Carbon Dioxide fluid	10/31/2019	9/18/2020		0	98,467	98,467
Sandia National Labs	219032	Additive Manufacturing of Continuous Fiber Thermoset Composites	10/31/2019	9/18/2020		0	94,225	94,225
Sandia National Labs	219033	Hyperspectral Frequency Mapping of Laser-Based Stimuli Applied to Integrated Circuits	10/30/2019	9/18/2020		0	50,651	50,651
Sandia National Labs	219128	Transforms for Correct-by-Construction Design of Stateful Digital Components from Specifications	11/4/2019	9/18/2020		0	98,754	98,754
Sandia National Labs	219144	Physics-Informed Deep Learning for Fast and Accurate Multiscale Simulations in Computational Solid Mechanics	11/5/2019	9/18/2020		0	106,828	106,828
Sandia National Labs	219145	Next Generation Electrical Contact Pin Alloy	11/5/2019	9/18/2020		0	118,999	118,999
Sandia National Labs	219146	Superconductivity in Silicon-Phosphorus Devices for Quantum Computing	11/5/2019	9/18/2020		0	88,002	88,002

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Sandia National Labs	219193	Hafnium-Boron Based Precursors for Vapor Deposition of Ultra High Temperature Materials	11/7/2019	9/18/2020		0	100,599	100,599
Sandia National Labs	219407	Pathfinding Research to Accelerate Accurate Optical Signal Predictions from Hydrodynamic and Computational Fluid Dynamic Simulations	11/27/2019	9/18/2020		0	389,611	389,611
Sandia National Labs	219439	Understanding Voltage Noise in Ion Traps	11/27/2019	9/17/2021		0	778,479	778,479
Sandia National Labs	219623	Additive Manufacturing for Magnetically Insulated Vacuum Transmission Lines and Convolutes	12/16/2019	9/17/2021		0	77,956	77,956
Sandia National Labs	219678	Entropy Stabilized Ceria, a Path to Clean Vehicular Emissions	12/19/2019	9/18/2020		0	101,363	101,363
Sandia National Labs	219690	Self-Emission Optical Imager on Z Machine (name of machine)	12/19/2019	9/17/2021		0	371,179	371,179
Sandia National Labs	219941	Heterogeneous Integration Materials Science for Electronic Warfare and Radio Frequency Photonic Applications	1/21/2020	9/18/2020		0	80,459	80,459
Sandia National Labs	219943	High Energy Density Capacitor Research	1/28/2020	9/18/2020		0	96,391	96,391
Sandia National Labs	220001	Embedded Impedance Analysis for Verification/Validation of Printed Circuit Board Fabrication	1/27/2020	9/18/2020		0	109,404	109,404
Sandia National Labs	220028	Space-Time Extreme Modeling of Global Terrorism Events	1/29/2020	9/17/2021		0	129,627	129,627
Sandia National Labs	220029	Testing the Predictive Power of Human-Constrained Machine Learning	1/29/2020	9/18/2020		0	165,598	165,598
Sandia National Labs	220030	Data-Driven Cognitive Modeling	1/29/2020	9/18/2020		0	286,622	286,622
Sandia National Labs	220192	Degradable and Environmentally Responsible Designed Polymers	2/12/2020	9/17/2021		0	188,472	188,472
Sandia National Labs	220218	Destabilization of Unmanned Aircraft Systems via Directed Acoustic Energy	2/13/2020	9/18/2020		0	104,925	104,925
Sandia National Labs	220292	Bioremediation Technologies	2/19/2020	9/17/2021		0	303,003	303,003
Sandia National Labs	220394	The Structure and Evolution of Science and Technology: A Modern Synthesis	3/5/2020	9/23/2022		0	125,201	125,201
Sandia National Labs	220450	Pulsed-Neutron Single-Event Effects in State-of-the-Art Technologies	3/5/2020	9/17/2021		0	123,178	123,178
Sandia National Labs	220451	Designing Plasma Current Switches for Use on Z Machine (name of machine)	3/5/2020	9/23/2022		0	111,904	111,904
Sandia National Labs	220500	Permafrost Resilience Bioindicators	3/6/2020	9/18/2020		0	173,728	173,728
Sandia National Labs	220583	Electrode Studies for High Energy Density, High Reversal Capacitor Research	3/12/2020	9/17/2021		0	123,668	123,668
Sandia National Labs	220604	Increasing the Lifetime of Epoxy Components with Antioxidant Stabilizers	3/17/2020	9/18/2020		0	85,928	85,928
Sandia National Labs	220605	Bridgeless Ignition of Thermal Battery Heat Pellets	3/17/2020	9/18/2020		0	68,079	68,079
Sandia National Labs	220607	Superconducting Metamaterials - The First Step Toward a Microwave Quantum Bus	3/17/2020	9/18/2020		0	101,971	101,971
Sandia National Labs	220608	Concurrent Evaluation of Autophagy Induction and Burkholderia Infection at the Single Cell Level	3/17/2020	9/18/2020		0	71,492	71,492
Sandia National Labs	220670	Polymer-based Metal-Organic Framework Thin Films for Future Complimentary Metal-Oxide-Semiconductor Devices	3/20/2020	9/17/2021		0	47,613	47,613
Sandia National Labs	220672	Backside Mapping of Silicon Integrated Circuits Based on Material Thermal Properties	3/20/2020	9/18/2020		0	84,040	84,040
Sandia National Labs	220673	Stronger Field-Emission Science via Coupling Novel Nanoscale Imaging Techniques	3/20/2020	9/18/2020		0	77,577	77,577
Sandia National Labs	220674	High Voltage Thermally Activated Reserve Batteries	3/20/2020	9/18/2020		0	77,416	77,416
Sandia National Labs	220675	Development of a Formalism to Predict Neutron Single Event Effects from Complex Test Objects	3/20/2020	9/17/2021		0	119,944	119,944

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Sandia National Labs	220676	Thin, Resonant, Infrared Detectors with Increased Radiation Tolerance for Global Security Threat Detection in Contested Environments	3/20/2020	9/18/2020		0	86,470	86,470
Sandia National Labs	220677	Understanding Microstructure Variability in Vapor-Deposited Energetic Materials by Using Phase-Field Methods	3/20/2020	9/18/2020		0	99,303	99,303
Sandia National Labs	220696	Trait Versus Skill: Individual Differences in Decision-Making Mistakes during Nuclear Weapon Development	3/23/2020	9/18/2020		0	82,221	82,221
Sandia National Labs	220697	Computing and Information Sciences Research for Coronavirus Disease of 2019 Pandemic	3/24/2020	9/18/2020		0	254,030	254,030
Sandia National Labs	220716	Research for Coronavirus Disease of 2019 Pandemic	3/26/2020	9/18/2020		0	27,693	27,693
Sandia National Labs	220717	Engineering Sciences Research for Coronavirus Disease of 2019 Pandemic	3/23/2020	9/18/2020		0	150,691	150,691
Sandia National Labs	220718	Bioscience Research for Coronavirus Disease of 2019 Pandemic	3/21/2020	9/18/2020		0	259,383	259,383
Sandia National Labs	220719	Materials Science Research for Coronavirus Disease of 2019 Pandemic	3/24/2019	9/18/2020		0	261,353	261,353
Sandia National Labs	220720	Nanodevices and Microsystems Research for Coronavirus Disease of 2019 Pandemic	3/24/2020	9/18/2020		0	30,386	30,386
Sandia National Labs	220724	CPAP Ventilators Needed for Rapid Response to Coronavirus Disease of 2019 by Modification of Continuous Positive Airway Pressure Equipment	3/24/2020	9/18/2020		0	117,699	117,699
Sandia National Labs	220728	Development of Novel Medical Countermeasures against Coronavirus Disease of 2019	3/24/2020	9/17/2021		0	797,078	797,078
Sandia National Labs	220732	High-throughput Discovery of Tools for Brain Protection	3/24/2020	9/18/2020		0	105,110	105,110
Sandia National Labs	220749	Short Term Plasticity for Artificial Neural Networks	3/26/2020	9/17/2021		0	180,779	180,779
Sandia National Labs	220892	Bridging Modern Power Concepts into Weapons Systems	4/8/2020	9/17/2021		0	186,793	186,793
Sandia National Labs	221008	Quantum Enhanced Optical Diagnostics	4/23/2020	9/17/2021		0	95,580	95,580
Sandia National Labs	221096	Earth Science Research for Coronavirus Disease of 2019 Pandemic	5/6/2020	9/18/2020		0	27,272	27,272
Sandia National Labs	221204	Precursor Derived Refractory Metal to Enhance the Performance of Carbon Fiber Reinforced Carbon Matrices (C/C) for Hypersonic Applications	5/19/2020	9/17/2021		0	175,511	175,511
Sandia National Labs	221274	A Dynamic Statistical Model for Explaining the Spread of Coronavirus Disease of 2019	5/28/2020	9/18/2020		0	99,390	99,390
Sandia National Labs	221276	Superposition of Numerous High-Voltage Nanosecond Pulsers for counter Unmanned Aircraft Systems Implementations	5/28/2020	9/18/2020		0	102,824	102,824
Sandia National Labs	221278	Systems Modeling of Hydraulic Wind Turbine Driven Batch Reverse Osmosis	5/28/2020	9/18/2020		0	53,378	53,378
Sandia National Labs	221279	Finding the Unknown Unknowns: Automated Feature Discovery for Characterizing Waveform Data	5/28/2020	9/18/2020		0	86,061	86,061
Sandia National Labs	221280	Developing an Active Learning algorithm for learning Bayesian classifiers under the Multiple Instance Learning scenario	5/28/2020	9/18/2020		0	66,763	66,763
Sandia National Labs	221281	High Fidelity Interface Modeling to Enable Enhanced Electromagnetics Modeling and Simulation Capabilities	5/28/2020	9/18/2020		0	51,602	51,602
Savannah River National Lab	LDRD-2017-00012	Power Hardware-in-the-Loop Testing of Distribution Solid State Transformer Controlling a Battery Energy Storage System at the Electrical Grid Research Innovation and Development Facility	10/3/2016	9/30/2018		-	(27,304)	(27,304)
Savannah River National Lab	LDRD-2017-00076	Synchrotron-Based Microstructural Characterization Method Development for Plutonium Oxides	10/3/2016	9/30/2019	These charges are okay. This happened	-	1,727	1,727

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Savannah River National Lab	LDRD-2018-00004	Development of Direct Injection/Ionization Mass Spectrometry Methods for Whole Molecule Characterization	10/1/2017	9/30/2020	N/A	-	58,961	58,961
Savannah River National Lab	LDRD-2018-00021	Hybrid Thermochemical Hydrogen Production	10/1/2017	9/30/2019		-	7,889	7,889
Savannah River National Lab	LDRD-2018-00024	Develop Savannah River National Lab's code for use as national response asset	10/1/2017	9/30/2019		-	247	247
Savannah River National Lab	LDRD-2018-00032	Oxyhydroxides on Aluminum Spent Nuclear Fuel: Formation Studies and Removal Practices to Prevent Radiolytic Gas Production	10/1/2017	9/30/2019		-	(1,685)	(1,685)
Savannah River National Lab	LDRD-2018-00055	Metal-Organics-Framework Glasses as Rad Contaminant Sequesters and Nuclear Waste Forms	10/1/2017	9/30/2020		-	106,993	106,993
Savannah River National Lab	LDRD-2018-00077	Synthesis and Characterization of Environmentally Relevant Actinide Compounds to Aid in the Development of Novel Remediation Tactics	10/1/2017	9/30/2019		-	4,645	4,645
Savannah River National Lab	LDRD-2018-00082	Gamma-Ray Raster Imaging with Robotic Data Collection	10/1/2017	9/30/2019		-	3,907	3,907
Savannah River National Lab	LDRD-2018-00095	Semi-automated change detection workflow for overhead imagery	9/30/2018	9/30/2019		-	1,007	1,007
Savannah River National Lab	LDRD-2018-00098	Hyperspectral Raman Imaging using a Spatial Heterodyne Spectrometer	10/1/2017	9/30/2020		-	111,085	111,085
Savannah River National Lab	LDRD-2018-00103	Kelvin Probe Force Microscopy for High-Resolution Imaging of Hydrogen in Steel Alloys	10/1/2017	9/30/2019		-	7,426	7,426
Savannah River National Lab	LDRD-2018-00126	Embedded Hardware Solution to Ensure Cyber Security of Industrial Control Systems	10/1/2017	9/30/2019		-	13,863	13,863
Savannah River National Lab	LDRD-2018-00129	Investigations into Environmental Radiation Protection & Radioactive Waste Transport	11/20/2017	9/30/2018		-	(681)	(681)
Savannah River National Lab	LDRD-2019-00001	Extraction of Mercury Utilizing Three-Dimensional Printed Media - Mercury Extraction Coalescer	10/1/2018	9/30/2019		-	44,330	44,330
Savannah River National Lab	LDRD-2019-00017	High Altitude Electromagnetic Pulse Transformer Defense through Power Electronics	10/1/2018	9/30/2020		-	299,561	299,561
Savannah River National Lab	LDRD-2019-00020	Purple "X" Gas Collection / Analysis	10/1/2018	9/30/2019		-	9,561	9,561
Savannah River National Lab	LDRD-2019-00058	Heat and Mass Transfer Study to Understand Thermal Cycling Absorption Process Scale Up Issues	10/1/2018	9/30/2020		-	(68,596)	(68,596)
Savannah River National Lab	LDRD-2019-00063	Development of Poison Resistant Palladium Alloys for Hydrogen Processing	10/1/2018	9/30/2019		-	9,492	9,492
Savannah River National Lab	LDRD-2019-00066	Hydrogen Process Imaging Using Magnetic Fields	10/1/2018	9/30/2020		-	252,996	252,996
Savannah River National Lab	LDRD-2019-00076	Time Domain Thermoreflectance and Photodeflection Signatures of He Bubbles in Metals	10/1/2018	9/30/2020		-	363,164	363,164
Savannah River National Lab	LDRD-2019-00087	An Improved Technique for Characterization of Actinide Isotopic Composition	10/1/2018	9/30/2019		-	28,994	28,994
Savannah River National Lab	LDRD-2019-00088	Novel Complex Hydride Flow Batteries for Grid Storage Applications	10/1/2018	9/30/2020		-	356,129	356,129
Savannah River National Lab	LDRD-2019-00090	Geospatial Intelligence Ground Truth and Trade Craft Development	10/1/2018	9/30/2020		-	178,500	178,500
Savannah River National Lab	LDRD-2019-00101	Process Image Analysis Using Big Data, Machine Learning, and Computer Vision	10/1/2018	9/30/2020		-	341,788	341,788
Savannah River National Lab	LDRD-2019-00106	Collaboration with USA Cyber-physical Systems for Signals Manipulation	10/1/2018	9/30/2020		-	376,092	376,092
Savannah River National Lab	LDRD-2019-00116	Development of Novel Solid-State Storage System for Plutonium Oxide using Excess Department of Energy Nickel	10/1/2018	9/30/2020		-	6,037	6,037
Savannah River National Lab	LDRD-2019-00117	Development of a Simple, Robust Plutonium Waste Form	10/1/2018	9/30/2019		-	16,123	16,123
Savannah River National Lab	LDRD-2019-00122	Metal Hydride Fuel Cell Powered Unmanned Aerial Vehicle	1/17/2018	9/30/2020		-	259,663	259,663
Savannah River National Lab	LDRD-2019-00144	Large Area Airborne Contamination Monitoring	10/1/2018	9/30/2019		-	18,528	18,528

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Savannah River National Lab	LDRD-2019-00145	Imaging of Liquid-Liquid Separation in a Centrifugal Contactor	10/1/2018	9/30/2019		-	9,081	9,081
Savannah River National Lab	LDRD-2019-00176	Next Generation of an Advanced High Efficiency Particle Collector	10/1/2018	9/30/2019		-	3,705	3,705
Savannah River National Lab	LDRD-2019-00194	Electronic Structure Calculations for Improving Catalyst Design for Use in the Hybrid Sulfur Cycle	10/1/2018	9/30/2019		-	6,566	6,566
Savannah River National Lab	LDRD-2019-00202	Electric Field Imager	10/1/2018	9/30/2019		-	300	300
Savannah River National Lab	LDRD-2019-00203	Infrared Radiation Spectroscopic Investigation of Solidified Uranium Hexafluoride Gas Samples	10/1/2018	9/30/2019		-	1,948	1,948
Savannah River National Lab	LDRD-2019-00215	Electrolytic Generation of Transportation Fuels in Molten Hydride Eutectic Electrolytes	10/1/2018	9/30/2019		-	10,939	10,939
Savannah River National Lab	LDRD-2019-00217	Toward Nano-Additive Manufacturing	10/1/2018	9/30/2019		-	19,728	19,728
Savannah River National Lab	LDRD-2019-00250	Concrete Inspection in Remote Areas with Robotic Arms	10/1/2018	9/30/2019		-	18,016	18,016
Savannah River National Lab	LDRD-2019-00251	Novel Perovskite Semiconductors for the Detection of Special Nuclear Material	10/1/2018	9/30/2019		-	189	189
Savannah River National Lab	LDRD-2019-00252	Three-Dimensional Printed Energy Discriminating X-Ray Panels	10/1/2018	9/30/2019		-	16,945	16,945
Savannah River National Lab	LDRD-2019-00253	Exploring the Suitability of Mxenes for Sensing Applications	10/1/2018	9/30/2019		-	26	26
Savannah River National Lab	LDRD-2019-00254	Development of biography-compatible fluorescent sensor	10/1/2018	9/30/2019		-	14,341	14,341
Savannah River National Lab	LDRD-2019-00256	To measure the energy barrier for tritium through graphene and related Two-Dimensional materials	10/1/2018	9/30/2019		-	19,996	19,996
Savannah River National Lab	LDRD-2019-00257	Low Energy X-ray Incorporation into Fused Deposition Modeling Three-Dimensional Printing	10/1/2018	9/30/2019		-	17,079	17,079
Savannah River National Lab	LDRD-2019-00258	Attachment to purging autosampler to allow for mercury analyte trapping on microcolumns	10/1/2018	9/30/2019		-	18,630	18,630
Savannah River National Lab	LDRD-2020-00005	Quantum Fields on Driven Plasmonic Nanostructures	10/1/2019	9/30/2021		-	236,673	236,673
Savannah River National Lab	LDRD-2020-00006	Fundamental 235U Nuclear Resonance Spectroscopy	10/1/2019	9/30/2022		-	368,646	368,646
Savannah River National Lab	LDRD-2020-00008	Material Developments for Three Dimensional/Four Dimensional Additive Manufacturing Technologies	10/1/2019	9/30/2020		-	271,691	271,691
Savannah River National Lab	LDRD-2020-00011	Deuterium concentration effects on cell cycle progression	10/1/2019	9/30/2021		-	75,910	75,910
Savannah River National Lab	LDRD-2020-00020	Comprehensive Chemical Fingerprinting by Multidimensional Gas Chromatography and Supervised Machine Learning	10/1/2019	9/30/2021		-	299,897	299,897
Savannah River National Lab	LDRD-2020-00033	Portable Industrial Control System Simulator	10/1/2019	9/30/2021		-	300,441	300,441
Savannah River National Lab	LDRD-2020-00044	Effect of Global Positioning System Manipulation to Traditional and Next Generation Relay Protection	10/1/2019	9/30/2021		-	249,581	249,581
Savannah River National Lab	LDRD-2020-00046	Component Development for Alkaline Unitized Regenerative Fuel Cells	10/1/2019	9/30/2021		-	324,303	324,303
Savannah River National Lab	LDRD-2020-00049	High Resolution Actinide Speciation Using Tensioned Metastable Fluid Detector	10/1/2019	9/30/2020		-	315,639	315,639
Savannah River National Lab	LDRD-2020-00050	LDRD-2020-00050	10/1/2019	9/30/2021		-	351,453	351,453
Savannah River National Lab	LDRD-2020-00051	Advanced Photoelectrode Development for the Production of Novel Solar Batteries	10/1/2019	9/30/2021		-	205,304	205,304
Savannah River National Lab	LDRD-2020-00054	Develop water detritiation models based on bench scale and pilot plant performance	10/1/2019	9/30/2020		-	220,791	220,791
Savannah River National Lab	LDRD-2020-00065	MAX phase materials and MXenes (class of two-dimensional inorganic compounds) as hydrogen barrier coatings. M is an early transition metal, A is an A group element, and X is carbon or nitrogen	10/1/2019	9/30/2021		-	277,882	277,882
Savannah River National Lab	LDRD-2020-00079	Solid State Ionics: Materials Development by Multiscale Modeling and Advanced Manufacturing Techniques	10/1/2019	9/30/2021		-	442,211	442,211

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Savannah River National Lab	LDRD-2020-00086	Robust, high energy density supercapacitors for portable energy storage	10/1/2019	9/30/2020		-	270,201	270,201
Savannah River National Lab	LDRD-2020-00111	Project Title: High-Sensitivity Electric Field Detection Based on Gas Polarization	10/1/2019	9/30/2021		-	258,589	258,589
Savannah River National Lab	LDRD-2020-00122	Extremely Durable Graphene Nanoribbon Reinforced Concrete	10/1/2019	9/30/2021		-	373,211	373,211
Savannah River National Lab	LDRD-2020-00125	Laser-Based Means for Accelerating Nuclear Decay Rate	10/1/2019	9/30/2020		-	193,096	193,096
Savannah River National Lab	LDRD-2020-00250	Molecular and Microstructural Bases for Understanding Microplastic Origin, Transport, and Fate	10/1/2019	9/30/2021		-	88,138	88,138
Savannah River National Lab	LDRD-2020-00252	Photon Entanglement Spectroscopy and Imaging in Actinide Research	10/1/2019	9/30/2020		-	75,591	75,591
Savannah River National Lab	LDRD-2020-00253	Low-profile Sealable Pressure Inserts for Portable Power Applications	10/1/2019	9/30/2020		-	92,488	92,488
Savannah River National Lab	LDRD-2020-00255	Patterning of magneto-optical nanomaterials	10/1/2019	9/30/2021		-	71,580	71,580
Savannah River National Lab	LDRD-2020-00256	Development of fluorescent clusters for chemical, biological, and nuclear detection	10/1/2019	9/30/2020		-	87,705	87,705
Savannah River National Lab	LDRD-2020-00257	Switchable Solvent Extraction for Isolation of Deuterium Oxide	10/1/2019	9/30/2020		-	42,933	42,933
Savannah River National Lab	LDRD-2020-00260	Computed Tomography Scanner Imaging of Liquid Moving Through Porous Media	10/1/2019	9/30/2020		-	34,384	34,384
Savannah River National Lab	LDRD-2020-00262	Novel Perovskite Semiconductors for the Detection of Special Nuclear Material	10/1/2019	9/30/2020		-	84,394	84,394
Savannah River National Lab	LDRD-2020-00266	High Performance Three Dimensional Printable X ray Scintillators for Remote Radiation Sensing Applications	10/1/2019	9/30/2020		-	91,217	91,217
Savannah River National Lab	LDRD-2020-00267	Electronic structure calculations for improving catalyst design for use in the Hybrid Sulfur Cycle	10/1/2019	9/30/2021		-	5,697	5,697
Savannah River National Lab	LDRD-2020-00268	High Temperature Water Electrolysis Testing of Gold based Electrodes for Hydrogen Production	10/1/2019	9/30/2020		-	45,709	45,709
Savannah River National Lab	LDRD-2020-00269	LDRD-2020-00269	10/1/2019	9/30/2020		-	55,332	55,332
Savannah River National Lab	LDRD-2020-00271	Development of bio-compatible fluorescent sensor	10/1/2019	9/30/2020		-	79,749	79,749
Savannah River National Lab	LDRD-2020-00280	Identify correct feedbacks for reinforced learning in robotics	10/1/2019	9/30/2021		-	42,374	42,374
Savannah River National Lab	LDRD-2020-00282	Quantitative Determination of Stable Cesium in Savannah River Site Tank Waste by Inductively Coupled Emission Spectroscopy	10/1/2019	9/30/2020		-	25,298	25,298
Savannah River National Lab	LDRD-2020-00284	Assessment of Model Cloud Parameterizations for Improved Atmospheric Fate and Transport	10/1/2019	9/30/2020		-	91,026	91,026
Savannah River National Lab	LDRD-2020-00286	Localized Electrorefining of Metals	10/1/2019	9/30/2020		-	93,186	93,186
Savannah River National Lab	LDRD-2020-00290	Rapid, Inexpensive Analysis of Metal Contaminated Sediment Pore Water Using Combined Techniques	10/1/2019	9/30/2020		-	53,042	53,042
Savannah River National Lab	LDRD-2020-00291	Development of High Capacity Energy Storage Materials	10/1/2019	9/30/2021		-	77,958	77,958
Savannah River National Lab	LDRD-2020-00296	Face Shield Protection for Pathogens	10/1/2019	9/30/2020		-	359,948	359,948
Savannah River National Lab	LDRD-2020-00298	Characterization of Properties for a Gamma-Irradiated International Simple Glass	10/1/2019	9/30/2020		-	39,080	39,080
Savannah River National Lab	LDRD-2020-00300	Crystal growth and material development of Cadmium Zinc Telluride Selenide for radiation detector applications	10/1/2019	9/30/2021		-	133,242	133,242
Savannah River National Lab	LDRD-2020-00302	Electric Field Imaging Small Scale Testing	10/1/2019	9/30/2020		-	8,403	8,403
Savannah River National Lab	LDRD-2020-00303	Evaluate the efficiency of commercial electrostatic, hybrid, and mechanical filters for removal of bioaerosols from ambient air	10/1/2019	9/30/2020		-	48,155	48,155
Savannah River Site	SR18010	Photo-cleaned Backgroundless Ion Chambers	10/1/2017	9/30/2020	N/A	0	118,037	118,037
Savannah River Site	SR18024	Molecular Sieves for Humidity Probe Protection	10/1/2017	9/30/2020	N/A	0	67,609	67,609

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Savannah River Site	SR19007	Future Thermal Cycling Absorption Process Implementation Issues	10/1/2018	9/30/2020		0	302,878	302,878
Savannah River Site	SR19012	Alternative Characterization Methods for Q-Passivated Components	10/1/2018	9/30/2020		0	200,725	200,725
Savannah River Site	SR19016	Characterization of Additive Manufacturing Materials for Savannah River Tritium Enterprise Service	10/1/2018	9/30/2020		0	148,458	148,458
Savannah River Site	SR19021	Tritium Aging of Regenerated Lanthanum-Nickel-Aluminum-75	10/1/2018	9/30/2021	N/A	0	153,526	153,526
Savannah River Site	SR19025	Advance Options for High-Resolution-Low-Mass Mass Spectroscopy and Tritium Instrumentation Demonstration Station Applications	10/1/2018	9/30/2021	N/A	0	148,421	148,421
Savannah River Site	SR19031	Evaluation of Inorganic and Organic Tritium Behavior in Forest Vegetation at Savannah River Site	10/1/2018	9/30/2021	N/A	0	102,787	102,787
Savannah River Site	SR19036	Improve Target Rod Preparation Cutter Head Performance	10/1/2018	9/30/2020		0	38,333	38,333
Savannah River Site	SR19039	All Metal Vacuum Scroll Pump Development for Tritium	10/1/2018	9/30/2020		0	50,485	50,485
Savannah River Site	SR20006	Development of Vacuum Brazing for Palladium-alloy Tubes and Alternative Diffuser Design	10/1/2019	9/30/2022	N/A	0	210,510	210,510
Savannah River Site	SR20020	Heating, Cooling, and Heat Transfer Medium for Regenerable Beds	10/1/2019	9/30/2022	N/A	0	141,046	141,046
SLAC National Accelerator Lab	18-004	Next Generation Power System Operator Training for Smart Grids	10/1/2017	9/30/2020		0	79,478	79,478
SLAC National Accelerator Lab	18-006	Gaussian Process Optimization : Machine Learning for Linac Coherent Light Source, Linac Coherent Light Source II, and the Free Electron Laser Farm of the Future	10/1/2017	9/30/2020		0	(212)	(212)
SLAC National Accelerator Lab	18-007	Modeling Strong-Field Quantum Electrodynamics at SLAC	5/1/2018	4/30/2021		0	112,167	112,167
SLAC National Accelerator Lab	18-012	Fresh-Slice Beams at the Linac Coherent Light Source II	10/1/2017	9/30/2020		0	185,751	185,751
SLAC National Accelerator Lab	18-013	Studying Bacterial Dehalogenation in Action	2/1/2018	1/30/2021		0	87,701	87,701
SLAC National Accelerator Lab	18-016	Developing Impulsive Nuclear and X-Ray Scattering to Study the Structural	1/1/2018	12/31/2020		0	110,513	110,513
SLAC National Accelerator Lab	18-018	Development of a High Repetition Rate Soft X-Ray Source in Preparation of Linac Coherent Light Source II Experiments	12/1/2017	11/30/2020		0	34,483	34,483
SLAC National Accelerator Lab	18-020	Novel Photoemissive Materials for Improving the Experimental Reach of Future Hard X-ray Free Electron Lasers	5/1/2018	4/30/2021		0	93,906	93,906
SLAC National Accelerator Lab	18-021	FY16 Panofsky - Cosmic Microwave Background Research	10/1/2017	9/30/2020		0	279,977	279,977
SLAC National Accelerator Lab	18-022	FY16 Panofsky - Advance Free Electron Laser Research	10/1/2017	9/30/2020		0	152,347	152,347
SLAC National Accelerator Lab	18-023	FY17 Panofsky-Development and Application of Ultrafast X-ray Imaging Techniques	10/1/2017	9/30/2020		0	222,219	222,219
SLAC National Accelerator Lab	18-024	FY17 Panofsky - The research focus of this proposal is to study the properties of Higgs bosons produced at high transverse momentum	10/1/2017	9/30/2020		0	316,006	316,006
SLAC National Accelerator Lab	18-025	FY18 Panofsky - Development of Multidimensional X-ray Spectroscopy with Stochastic Signal Recovery	10/1/2017	9/30/2020		0	221,621	221,621
SLAC National Accelerator Lab	18-026	FY18 Panofsky - Novel Methods for Single-Particle Bio-imaging Using X-ray and Electron Sources	11/1/2017	10/31/2020		0	495,109	495,109
SLAC National Accelerator Lab	19-008	Engineering Atomically Controlled Complex Oxide/Aqueous Interfaces	10/1/2018	9/30/2021		0	182,217	182,217

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SLAC National Accelerator Lab	19-012	Active Q-switching an X-ray Cavity to Enable a Regenerative Amplifier Free-Electron Laser at Linac Coherent Light Source II	11/1/2018	10/31/2021		0	230,219	230,219
SLAC National Accelerator Lab	19-013	High-Throughput Real-Time Theory	10/1/2018	9/30/2021		0	165,736	165,736
SLAC National Accelerator Lab	19-017	Generation and Manipulation of High Pressure, Low Temperature Plasmas Using High-Power radio frequency Pulse Modulation	10/1/2018	9/30/2021		0	172,554	172,554
SLAC National Accelerator Lab	19-026	FY19 Panofsky- Matter in Extreme Conditions Research	10/1/2018	9/30/2021		0	293,705	293,705
SLAC National Accelerator Lab	19-027	FY19 Panofsky- Higgs Boson Research	10/1/2018	9/30/2021		0	235,466	235,466
SLAC National Accelerator Lab	20-001	X-ray Spectrometer for Pulse by Pulse Full Frame Collection at 1 Megahertz	11/1/2019	10/31/2022		0	396,248	396,248
SLAC National Accelerator Lab	20-002	Lumped Element Resonators for Microwave Superconducting Quantum Interference Device Multiplexing	7/1/2020	6/30/2023		0	47,990	47,990
SLAC National Accelerator Lab	20-004	Reversible Bond Dynamics and Polymer Network Rearrangement in Strained Dynamic Polymer Networks	2/1/2020	1/31/2023		0	96,002	96,002
SLAC National Accelerator Lab	20-005	Revolutionary Methods for Improving Color Center Quality and Positioning for Quantum Information Science	11/1/2019	10/31/2022		0	154,796	154,796
SLAC National Accelerator Lab	20-006	Superconducting Photon Transducers via Millimeter-Wave Quantum Channels	10/1/2019	9/30/2022		0	300,049	300,049
SLAC National Accelerator Lab	20-007	Fiscal Year 2020 Panofsky- Dark Energy Research	11/1/2019	10/31/2022		0	272,211	272,211
Thomas Jefferson National Accelerator Facility	2018-LDRD-09	Development of Next Generation Parallel Event Processing Framework	10/1/2017	9/30/2020	This project was exactly 3 years.	0	174,318	174,318
Thomas Jefferson National Accelerator Facility	2019-LDRD-1	Accelerator Novel High Current Superconducting Radiofrequency Cavity with On-Cell Waveguide Dampers	10/1/2018	9/30/2020		0	48,970	48,970
Thomas Jefferson National Accelerator Facility	2019-LDRD-10	Evaluation And Development Of Algorithms And Techniques For Streaming Detector Readout	10/1/2018	9/30/2020		0	64,739	64,739
Thomas Jefferson National Accelerator Facility	2019-LDRD-12	Tagged Short-Range Correlations for Medium to Heavy Ions at Jefferson Lab Electron Ion Collider	10/1/2018	9/30/2019		0	5,421	5,421
Thomas Jefferson National Accelerator Facility	2019-LDRD-13	Universal Monte Carlo Event Generator	10/1/2018	9/30/2020		0	162,342	162,342
Thomas Jefferson National Accelerator Facility	2020-LDRD-12	Beamline for Electron-Beam Processing at the Upgrade Injector Test Facility	10/1/2019	9/30/2020		0	151,312	151,312
Thomas Jefferson National Accelerator Facility	2020-LDRD-3	Machine Learning Based Cavity Fault Classification and Prediction	10/1/2019	9/30/2020		0	170,923	170,923
Y-12 National Security Complex	PD-18C590	Systems Based Deoxyribonucleic Acid Risk Mitigation Model	10/1/2017	9/30/2020		0	182,061	182,061
Y-12 National Security Complex	PD18A590	Process Control and Repeatability, Defect Detection, and Material Behavior	10/1/2017	9/29/2020		0	325,961	325,961
Y-12 National Security Complex	PD18N630	Nuclear Fuel Development	10/1/2017	9/29/2020		0	583,944	583,944
Y-12 National Security Complex	PD18N710	Uranium Coating and Plating Process Development	10/1/2017	9/29/2020		0	671,347	671,347
Y-12 National Security Complex	PD18Q760	Programmable Logic Controller for Mass Spectrometers	10/1/2017	9/29/2020		0	324,292	324,292
Y-12 National Security Complex	PD18S150	Pilot Scale Lithium Purification	10/1/2017	9/29/2020		0	560,950	560,950
Y-12 National Security Complex	PD18S310	Modernization of the Insider Quantification and Ranking Process	10/1/2017	9/29/2020		0	418,487	418,487
Y-12 National Security Complex	PD18S440	Machine Dust Oxygen Reduction	10/1/2017	9/29/2020		0	99,979	99,979
Y-12 National Security Complex	PD18S620	Modern Lithium Crusher	10/1/2017	9/29/2020		0	14,537	14,537
Y-12 National Security Complex	PD18W500	Standoff gamma imaging evaluation and applications	10/1/2017	9/29/2020		0	84,772	84,772
Y-12 National Security Complex	PD19C290	Virtual Reality Training Environments	10/1/2018	9/29/2021		0	517,192	517,192
Y-12 National Security Complex	PD19E190	Eco-Friendly Quantum Dot Coating for Radiation Contamination Indication	10/1/2018	9/29/2021		0	318,189	318,189
Y-12 National Security Complex	PD19F440	Finish Machining Modulated Tool Path	10/1/2018	9/29/2021		0	357,039	357,039

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Y-12 National Security Comp	PD19I740	Digitization of Maintenance Round Sheets for Trending Analysis & Analytics	10/1/2018	9/29/2021		0	2,625	2,625
Y-12 National Security Comp	PD19I790	Development of a Mobile Worker System	10/1/2018	9/29/2021		0	138,918	138,918
Y-12 National Security Comp	PD19L610	Lithium Plug Detection and Removal	10/1/2018	9/29/2021		0	220,106	220,106
Y-12 National Security Comp	PD19L660	Near Net Shape Lithium Hydride	10/1/2018	9/29/2021		0	160,587	160,587
Y-12 National Security Comp	PD19L800	Lithium Electrolysis Cell	10/1/2018	9/29/2021		0	1,581,931	1,581,931
Y-12 National Security Comp	PD19M000	Supply Chain Inventory Optimization	6/1/2019	9/30/2021		0	173,722	173,722
Y-12 National Security Comp	PD19N140	Nuclear Detection Sensor Testing Center Non-Destructive Testing	10/1/2018	9/29/2021		0	1,197,044	1,197,044
Y-12 National Security Comp	PD19N180	Texas A&M Technology Suite- The first objective utilizes the Rotating Electrode Process to produce microspheres of uranium alloys for future additive manufacturing concepts. The second object is to implement a portable, real time fluorescent analysis method to determine airborne beryllium concentrations, as well as, develop a topical fluorescent spray for remediation of high beryllia contamination environments. The third objective is to determine physical properties of incorporating silicon carbide into uranium zirconium hydride prepared by a powder metallurgical methods. The nuclear fuel additive will reduce reactor temperature thereby increasing fuel life and reduce fission product release.	10/1/2018	9/29/2021		0	200,419	200,419
Y-12 National Security Comp	PD19N260	Manufacturing Innovation Network /Industrial Base Cybersecurity Initiative Collaboration	10/1/2018	9/29/2021		0	608,721	608,721
Y-12 National Security Comp	PD19N570	Supply Chain Secure Collaboration	10/1/2018	9/29/2021		0	209,508	209,508
Y-12 National Security Comp	PD19Q030	Uncertainty Quantification for Metrology in Computed Tomography	10/1/2018	9/29/2021		0	74,544	74,544
Y-12 National Security Comp	PD19Q910	Canned Sub- Assembly Computed Tomography	10/1/2018	9/29/2021		0	24,578	24,578
Y-12 National Security Comp	PD19S450	Ultra Wide Band as a Perimeter Intrusion System	10/1/2018	9/29/2021		0	273,049	273,049
Y-12 National Security Comp	PD19S940	Evacuation and Accountability through biometrics	10/1/2018	9/29/2021		0	246,212	246,212
Y-12 National Security Comp	PD19U750	Calciner Testing	10/1/2018	9/29/2021		0	372,365	372,365
Y-12 National Security Comp	PD19U950	Measurement of C and other elements in microwave castings using hand-held laser induced breakdown spectroscopy	10/1/2018	9/29/2021		0	28,988	28,988
Y-12 National Security Comp	PD19U970	Electron Beam furnace support	10/1/2018	9/29/2021		0	84,449	84,449
Y-12 National Security Comp	PD20002A	Installation of Safety Hardware on Atomizer	10/1/2019	9/30/2020		0	315,336	315,336
Y-12 National Security Comp	PD20002B	Chip Melt: Demonstrate Multiple Crucible melts	10/1/2019	9/30/2020		0	91,528	91,528
Y-12 National Security Comp	PD20002C	Argus Training Gateway	10/1/2019	9/30/2020		0	45,996	45,996
Y-12 National Security Comp	PD200030	Material Properties Studies	10/1/2019	9/30/2022		0	306,070	306,070
Y-12 National Security Comp	PD20C260	Predictive Analytics and Interactive Dashboard	10/1/2019	9/30/2022		0	561,154	561,154
Y-12 National Security Comp	PD20I090	Facility Predictive Maintenance	10/1/2019	9/30/2022		0	1,535,252	1,535,252
Y-12 National Security Comp	PD20L350	Outgassing Analysis of Magnesium Oxide / Lithium Hydride Conditioning Process	10/1/2019	9/30/2022		0	406,081	406,081
Y-12 National Security Comp	PD20L450	Novel Alloys for Isotope Enrichment	10/1/2019	9/30/2022		0	86,284	86,284
Y-12 National Security Comp	PD20L860	Lithium Isotope Separation	10/1/2019	9/30/2020		0	158,918	158,918
Y-12 National Security Comp	PD20N180	Performance Based Training Applications	10/1/2019	9/30/2022		0	239,626	239,626
Y-12 National Security Comp	PD20N350	Passive and Active Microwave Sensing of Ionizing Radiation	10/1/2019	9/30/2022		0	57,790	57,790
Y-12 National Security Comp	PD20P020	Effects of Long Term Aging on Direct Casting Binary Material	10/1/2019	9/30/2022		0	410,367	410,367
Y-12 National Security Comp	PD20P320	Low Frequency Computed Tomography Techniques	10/1/2019	9/30/2022		0	91,731	91,731
Y-12 National Security Comp	PD20P380	Colquitt Project	10/1/2019	9/30/2021		0	3,675,426	3,675,426
Y-12 National Security Comp	PD20P650	Holloway Process Development	10/1/2019	9/30/2020		0	542,952	542,952
Y-12 National Security Comp	PD20S280	Predictors of Emergent Risk and Integrity Lapses - Part 2	10/1/2019	9/30/2022		0	99,069	99,069

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Y-12 National Security Comp	PD20S950	Emergency Communications over Mesh Data Network	10/1/2019	9/30/2020		0	125,293	125,293
Y-12 National Security Comp	PD20T010	A Sol-Gel Route to Atomically Homogeneous Uranium Alloys	10/1/2019	9/30/2022		0	125,208	125,208
Y-12 National Security Comp	PD20T200	Programmable Automation Controller for Diffuse Reflectance Infrared Fourier Transform Spectrometer	10/1/2019	9/30/2022		0	79,337	79,337
Y-12 National Security Comp	PD20T230	Four Dimensional Computed Tomography for Material Characterization	10/1/2019	9/30/2022		0	141,578	141,578
Y-12 National Security Comp	PD20T770	Uranium Hydride Corrosion Pits Study using Hand-Held Laser Induced Breakdown Spectroscopy	10/1/2019	9/30/2022		0	317,623	317,623
Y-12 National Security Comp	PD20T780	Evaluation of micro-tomography capability at Y-12 National Security Complex	10/1/2019	9/30/2020		0	20,555	20,555
Y-12 National Security Comp	PD20T820	Ultrasonic Evaluation of the Plant Fire Suppression Systems	10/1/2019	9/30/2022		0	217,182	217,182
Y-12 National Security Comp	PD20U120	Vacuum Arc Remelter Alloy Startup Operations	10/1/2019	9/30/2022		0	1,324,426	1,324,426
Y-12 National Security Comp	PD20U240	Vacuum Arc Remelter Electrode Fabrication and Welding	10/1/2019	9/30/2020		0	65,697	65,697
Y-12 National Security Comp	PD20U270	Pyroprocessing - Electro-Refining	10/1/2019	9/30/2022		0	558,624	558,624
Y-12 National Security Comp	PD20U330	Grain Size Manipulation in Microwave Castings	10/1/2019	9/30/2022		0	66,527	66,527
Y-12 National Security Comp	PD20U340	Advanced Modeling for Casting Solidification - Particle Transport - Visualization	10/1/2019	9/30/2022		0	149,449	149,449
Y-12 National Security Comp	PD20U490	Advanced Machining Technologies	10/1/2019	9/30/2022		0	530,942	530,942
Y-12 National Security Comp	PD20U660	Dry Vacuum Cleaner for Enriched Uranium Operations	10/1/2019	9/30/2022		0	69,997	69,997
Y-12 National Security Comp	PD20U750	Pyroprocessing - Direct Electrolytic Reduction	10/1/2019	9/30/2022		0	495,848	495,848
Y-12 National Security Comp	PD20U850	Electron Beam Wire Additive	10/1/2019	9/30/2022		0	909,847	909,847
Y-12 National Security Comp	PD20U910	Teledyne Brown Engineering Microwave Insitu Uranium Alloying	10/1/2019	9/30/2022		0	155,247	155,247