Solar Energy Technologies Office CSP Program Summit 2019
March 18–19, 2019 | Oakland, CA

Day 1	Session	Location
8:00AM–8:30AM	**REGISTRATION**	
8:30AM–8:45AM	**INTRODUCTION** *Charlie Gay, Director, Solar Energy Technologies Office, U.S. Department of Energy (DOE)*	**Junior Ballroom**
8:45AM–9:00AM	**Concentrating Solar-Thermal Power (CSP) Overview** *Avi Shultz, CSP Program Manager, Solar Energy Technologies Office*	**Junior Ballroom**
9:00AM-10:30AM	**Panel – CSP in the Evolving Grid and Energy Market** *Cara Libby, Electric Power Research Institute (Moderator)* *Paul Denholm, National Renewable Energy Laboratory* *Caitlin Murphy, National Renewable Energy Laboratory* *Jimmy Nelson, E3* *Logan Goldie-Scot, Bloomberg NEF*	**Junior Ballroom**
10:30AM–11:00AM	**BREAK**	
11:00AM–12:30PM	**Panel – The Potential U.S. Market for CSP** *Heather Curlee, Wilson Sonsini Goodrich & Rosati (Moderator)* *Ric O'Connell, Gridlab* *Jenifer Hedrick, Southern California Edison* *Clyde Loutan, California Independent System Operator* *Byron Woertz, Western Electricity Coordinating Council*	**Junior Ballroom**
12:30PM–1:30PM	**LUNCH**	
1:30PM–3:00PM	**Panel – CSP Development Around the World** *David Kearney, K&A (Moderator)* *Hicham Bouzekri, Moroccan Agency for Sustainable Energy (MASEN)* *Zhifeng Wang, Chinese Academy of Sciences* *Ana María Ruz, Corporación de Fomento de la Producción de Chile (CORFO)* *Wes Stein, Commonwealth Scientific Industrial Research Organization (CSIRO)* *Mercedes Sierra, SENER Engineering and Systems, Inc.*	**Junior Ballroom**
3:00PM-3:15PM	**Overview of the DOE CSP Program** *Avi Shultz, Solar Energy Technologies Office*	**Junior Ballroom**
3:15PM–3:45PM	**BREAK**	
3:45PM–6:00PM	**Poster Session and Networking**	**OCC 210/ 211/ 208**

Day 2	Session	Location
	TECHNICAL PLENARY—GEN3 CSP FULLY INTEGRATED PROJECTS	
8:30AM–10:00AM	**Awardee Presentations, Panel, and Q&A Discussion** **Liquid-Phase Pathway to Sunshot** *Craig Turchi, National Renewable Energy Laboratory* **Particle Pilot Plant (G3P3): Integrated High-Temperature Particle System for CSP** *Cliff Ho, Sandia National Laboratories* **Gen3 Gas-Phase System Development and Demonstration** *Shaun Sullivan, Brayton Energy*	**Junior Ballroom**
10:00AM–10:30AM	**BREAK**	
	PARALLEL TECHNICAL SESSIONS	
10:30AM–12:00PM	**MOLTEN SALTS** **Technical Plenary Presentation** **Enabling High-Temperature Molten Salt CSP through the Facility to Alleviate Salt Technology Risks (FASTR)** *Kevin Robb, Oak Ridge National Laboratory* **Awardee Presentations** **Comparison of Protecting Layer Performance for Corrosion Inhibition in Molten Chloride Salts Through Interfacial Studies at the Molecular Scale** *Sheng Dai, Oak Ridge National Laboratory* **Full Loop Thermodynamic Corrosion Inhibition and Sensing in Molten Chloride Systems** *Brenda Garcia-Diaz, Savannah River National Laboratory* **Molten Chloride Thermophysical Properties, Chemical Optimization, and Purification** *Judith Vidal, National Renewable Energy Laboratory* **Progression to Compatibility Evaluations in Flowing Molten Salts** *Bruce Pint, Oak Ridge National Laboratory* **Development of In-Situ Corrosion Kinetics and Salt Property Measurements** *Li Liu, Rensselaer Polytechnic* **High-Temperature, Raman-Spectroscopy-Based, Inline, Molten Salt Composition Monitoring System for Concentrating Solar Power Systems** *Kevin Harsh, Sporian Microsystems*	**Oakland**

10:30AM–12:00PM	**PARTICLE TECHNOLOGIES** **Technical Plenary Presentation** **Advanced Characterization of Particulate Flows for Concentrating Solar Power Applications** *Peter Loutzenhiser, Georgia Tech* **Awardee Presentations** **Characterization and Mitigation of Radiative, Convective, and Particle Losses in High-Temperature Particle Receivers** *Cliff Ho, Sandia National Laboratories* **High-Temperature Particle Heat Exchanger for sCO_2 Power Cycles** *Cliff Ho, Sandia National Laboratories* **Quantifying Thermophysical Properties and Durability of Particles and Materials for Direct and Indirect Heat Transfer Mechanisms** *Kevin Albrecht, Sandia National Laboratories* **GEN3D Experimental and Numerical Development of Gen3 Durability Life Models** *Todd Otanicar, University of Tulsa* **Thermophysical Property Measurements of Heat Transfer Media and Containment Materials** *Shannon Yee, Georgia Tech* **Non-Contact Thermophysical Characterization of Solids and Fluids for Concentrating Solar Power** *Renkun Chen, University of California, San Diego*	**California**

10:30AM–12:00PM	**DESALINATION COLLECTORS AND SYSTEMS** **Technical Plenary Presentation** **Solar for Industrial Process Heat** *Robert Margolis, National Renewable Energy Laboratory* **Awardee Presentations** **Direct Solar Thermal Forward Osmosis Desalination Of Produced Waters** *Robert Kostecki, Lawrence Berkeley National Laboratory* **Energy Where it Matters: Delivering Heat to the Membrane/Water Interface for Enhanced Thermal Desalination** *David Jassby, University of California, Los Angeles* **Low-Cost Desalination Using Nanophotonics Enhanced Direct Solar Membrane Distillation** *Qilin Li, Rice University* **Solar-Driven Desalination by Membrane Distillation using Ceramic Membranes** *Jeffery McCutcheon, Fraunhofer Center for Energy Innovation* **Zero Liquid Discharge Water Desalination Process using Humidification-Dehumidification in a Thermally-Actuated Transport Reactor** *Bahman Abbasi, Oregon State University* **High-Efficiency, Zero Liquid Discharge, Multiple Effect Adsorption Distillation** *Howard Yuh, GreenBlu* **Supercritical Treatment Technology for Water Purification** *Michael Mann, University of North Dakota*	**Junior Ballroom**
12:00PM–2:00PM	**LUNCH AND POSTER SESSION**	**OCC 210/ 211/ 208**
	PARALLEL BREAKOUT SESSIONS	

2:00PM–3:30PM	**COMPONENTS FOR GEN3 CSP** **Awardee Presentations** **Robust High-Temperature Heat Exchangers** *Kenneth Sandhage, Purdue University* **High-Temperature Pumps and Valves for Molten Salt** *Asegun Henry, Massachusetts Institute of Technology* **Integrated Thermal Energy Storage Heat Exchanger for Concentrating Solar Power Applications** *Jim Nash, Brayton Energy* **Development of High-Temperature Molten Salt Pump Technology for Gen3 Solar Power Tower Systems** *Keith Oldinski, Hayward Tyler* **Oil-Free, High-Temperature Heat Transfer Fluid Circulator** *Hooshang Heshmat, Mohawk Innovative Technology* **Low-Cost High Temperature Ceramic Heat Exchangers** *Dileep Singh, Argonne National Laboratory*	**Oakland**
2:00PM–3:30PM	**THERMAL ENERGY STORAGE** **Awardee Presentations** **Power Cycle with Integrated Thermochemical Energy Storage** *Timothy Held, Echogen Power Systems* **Integrated Solar Receiver with Thermal Storage for an sCO_2 Power Cycle** *Shaun Sullivan, Brayton Energy* **Solar Thermal Energy Ammonia Production (STEAP)** *Andrea Ambrosini, Sandia National Laboratories* **Integrated Heat Pumps Thermal Storage and Power Cycle for CSP** *Joshua McTigue, National Renewable Energy Laboratory* **Real-Time Operations Optimization Software** *Michael Wagner, National Renewable Energy Laboratory*	**California**

2:00PM–3:30PM	**DESALINATION** **Awardee Presentations** **Ultra-Compact and Efficient Heat Exchanger for Solar Desalination with Unprecedented Scaling Resistance** *Anthony Jacobi, University of Illinois at Urbana-Champaign* **Hawaii Solar Desalination Project** *Gregory Barbour, Natural Energy Laboratory of Hawaii Authority* **SkyTrough Vacuum Membrane: An Extreme Low-Cost Solar-Thermal Collector for Desalination** *Nate Schuknecht, Skyfuel* **Solar Steam on Demand** *Philip Gleckman, Sunvapor* **Loop Thermosyphon Enhanced Solar Collector** *Fangyu Cao, Advanced Cooling Technology* **The Internal Compound Parabolic Concentrator (ICPC): A Novel Low Cost Solar-Thermal Collection System for Desalination Processes** *Roland Winston, University of California, Merced* **GIS-Based Graphical User Interface Tool for Analyzing Solar Thermal Desalination Systems and High-Potential Implementation Regions** *Vasilis Fthenakis, Columbia University*	**Junior Ballroom**
3:30PM–4:00PM	**BREAK**	
	PARALLEL BREAKOUT SESSIONS	

4:00PM–5:30PM	**METALS AND MATERIALS** **Technical Plenary Presentation** **Improving Economics of Gen3 CSP System Components through Fabrication and Application of High-Temperature Nickel-Based Alloys** *John Shingledecker, Electric Power Research Institute* **Awardee Presentations** **Creep-Fatigue Behavior and Damage Accumulation of a Candidate Structural Material for Concentrating Solar Power Solar-Thermal Receiver** *Michael McMurtrey, Idaho National Laboratory* **Ceramic Castable Cement Tanks and Piping for Molten Salt** *Asegun Henry, Massachusetts Institute of Technology* **Cast Components for High-Temperature CSP Thermal Systems** *Govindarajan Muralidharan, Oak Ridge National Laboratory* **Novel Corrosion and Erosion Protective Amorphous Alloys Coatings** *Evelina Vogli, LM Group Holdings* **High-Toughness Cermets for Molten Salt Pumps** *Joseph Hensel, Powdermet*	**Oakland**

4:00PM–5:30PM	**POWER CYCLES** **Technical Plenary Presentation** **Development of a High-Efficiency Hot Gas Turbo-Expander and Low-Cost Heat Exchangers for Concentrating Solar Power Applications** *Jeff Moore, Southwest Research Institute* **Awardee Presentations** **Compression System Design and Testing for sCO_2 CSP Operation** *Jason Mortzheim, General Electric* **Sodium Ion Expansion Engine Power Block for Distributed CSP** *Shannon Yee, Georgia Tech* **Development of an Integrally Geared Compressor-Expander for sCO_2 Brayton Cycle Power Generation Applications** *Jason Wilkes, Southwest Research Institute* **Advanced Supercritical Carbon Dioxide Cycles Regenerator** *Mark Anderson, University of Wisconsin* **High-Flux Microchannel Receiver Development** *Brian Fronk, Oregon State University* **Design and Implementation of a 1-3 MW_{th} sCO_2 Support Loop for Maturation of Molten Salt, Particulate, and Gas-Phase Thermal Storage Primary Heat Exchangers** *Matt Carlson, Sandia National Laboratories*	**California**

4:00PM–5:30PM	**COLLECTORS** **Awardee Presentations** **ATLAS: Advanced Trough with Lower-Cost System-Architecture** *Patrick Marcotte, Solar Dynamics* **DROP C: The Drop-in, Ring-of-Power Heliostat** *Kyle Kattke, Solar Dynamics* **Dielectric Metasurface Concentrators** *Boubacar Kante, University of California, San Diego* **Low-Cost Concentrated Solar Power Collector** *Greg Mungas, Hyperlight Energy* **Universal Field Assessment & Survey Tool** *Julius Yellowhair, Sandia National Laboratories* **Distant Observer Solar Field Aerial Collector Field Evaluation** *Guangdong Zhu, National Renewable Energy Laboratory* **Development and Validation of A Xenon Arc Lamp Accelerated Aging Method for CSP Solar Mirrors** *Robert Tirawat, National Renewable Energy Laboratory* **Full-Scale Hydrogen Mitigation Installation and Testing at Nevada Solar One** *Greg Glatzmaier, National Renewable Energy Laboratory*	**Junior Ballroom**
5:30PM–6:00PM	**CLOSING SESSION**	