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## A Message From Leadership

I'm honored to be kicking off 2020's first edition of the AI@DOE newsletter as Secretary of the single greatest incubator of technological innovation this country – and perhaps the world – has ever known... the Department of Energy.



Artificial intelligence will be as transformative to our daily lives as electricity was to American society more than a century ago. With its near 80-year legacy of innovation, unmatched R&D infrastructure, and unquenchable thirst for accelerating scientific discovery, DOE and our 17 National Labs are uniquely positioned to lead the charge to reap its untold benefits.

Today, DOE and its National Laboratories are leading more than 600 different AI projects that are designed to strengthen our core missions of energy, cyber, and national security and to accelerate scientific discovery.

But AI's impact will extend well beyond DOE's traditionally understood core missions. We're also fostering AI partnerships to help predict seismic activity like earthquakes, optimize transportation, smart cities and autonomous vehicles, and to accelerate new medical diagnoses and treatments for our most deadly diseases.

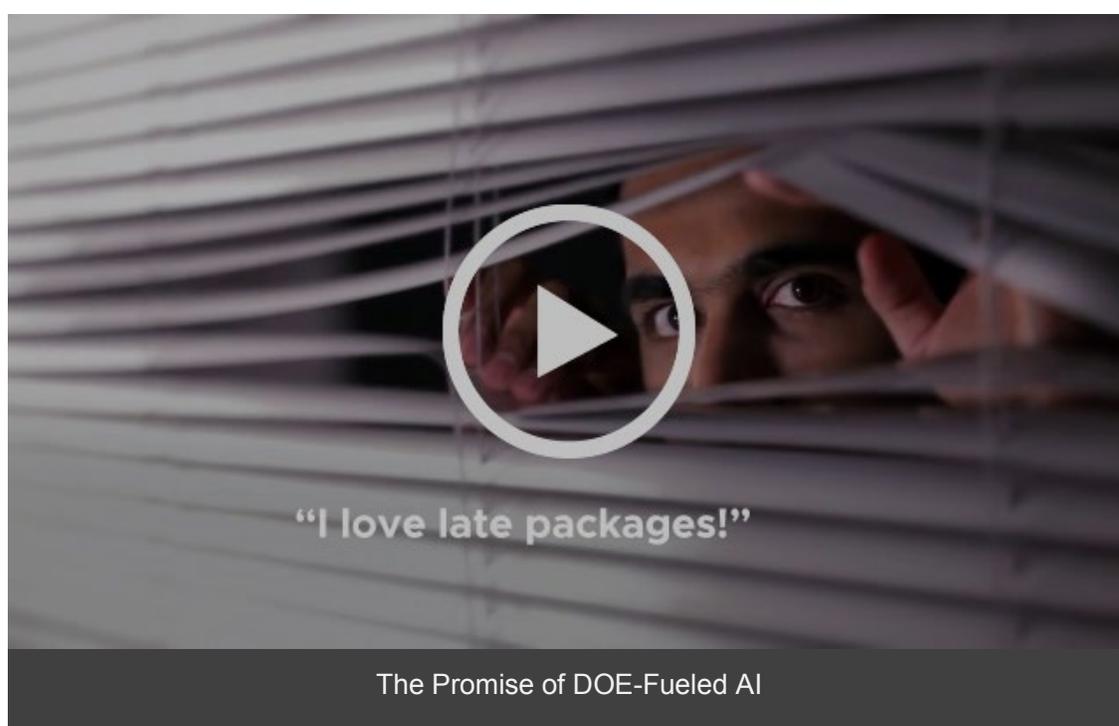
In addition, I plan to ensure that DOE leads by example in the application of AI to streamline our internal business operations. DOE will turn the power of AI on itself to optimize efficiencies in our Power Marketing Administrations, streamline our procurement and contracting processes, and work to speed the review of

permitting and infrastructure investment projects.

I am fully committed to transforming DOE into a world-leading enterprise in the research, development, delivery, and adoption of AI. That is why we created the new Artificial Intelligence & Technology Office (AITO) to oversee and coordinate all current and future AI activities at DOE.

AI has the potential to literally improve and save countless lives. I'm proud to say that DOE is now organized to meet its obligation to ensure that it is used as a force for good.

Secretary Dan Brouillette



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## This Month's Highlights

### SpaceCom 2019

Last month, Under Secretary for Science Paul Dabbar spoke at the SpaceCom Expo about how DOE is working to strengthen its research capabilities in the space industry in areas such as quantum computing, planetary defense, and astronomy.



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## AI@DOE News

### **NREL Receives \$1 million from Federal Artificial Intelligence Initiative**

The National Renewable Energy Laboratory has received \$1 million from DOE for investments in energy-related machine learning. The award will enable the identification of new battery materials faster, thereby accelerating the rate at which battery performance is improving, and fund modeling of wind turbines using machine-learning assisted turbulence models.

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## AI in the News

### **PNNL Researchers Make Splash with Machine Learning at SC19**

At a conference featuring the most advanced computing hardware and software, Nathan Baker, Director for the Advanced Computing, Mathematics and Data Division at PNNL, highlighted the incredible potential of ML in a range of applications.

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## Shaping the Technology Transforming our Society

Technology and society are intertwined. Self-driving cars and facial recognition technologies are no longer science fiction, and data and efficiency are harbingers of this new world. In the coming decades, further advances in artificial intelligence and the dawn of quantum computing are poised to change lives in both discernible and inconspicuous ways. That's why representatives from Fermilab joined with the Chicago Quantum Exchange, the University of Chicago and others for a two-way workshop on the ethical development and implantation of AI and quantum computing.

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## Careers in AI



### Rui Yang's Story

Rui Yang is a senior research engineer in the Power Systems Engineering Center at the National Renewable Energy Laboratory (NREL). She joined NREL in 2015 from Carnegie Mellon University where she obtained her Ph.D. specializing in machine learning and optimization for power systems. Since

joining NREL, she has led development in applying artificial intelligence into power systems optimization and control to realize distributed architecture with high penetration levels of distributed energy resources integrated at the customer side.

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**IMAGE OF THE WEEK:**

MADSTARE: National Lab researchers are bringing to bear quantum-powered AI and reinforcement learning techniques to detect, monitor, and characterize threats in space.



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