

DOE Office of Public Affairs
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DOE's Office of Science Selects 49 Scientists to Receive Early Career Research Program Funding

Program provides support to exceptional researchers

WASHINGTON, DC – The Department of Energy's (DOE's) Office of Science has selected 49 scientists from across the nation – including 22 from DOE's national laboratories and 27 from U.S. universities – to receive significant funding for research as part of DOE's Early Career Research Program. The effort, now in its seventh year, is designed to bolster the nation's scientific workforce by providing support to exceptional researchers during the crucial early career years, when many scientists do their most formative work.

"We invest in promising young researchers early in their careers to support lifelong discovery science to fuel the nation's innovation system," said Cherry Murray, director of DOE's Office of Science. "We are proud of the accomplishments these young scientists already have made, and look forward to following their achievements in years to come."

Under the program, university-based researchers will receive at least \$150,000 per year to cover summer salary and research expenses. For researchers based at DOE national laboratories, where DOE typically covers full salary and expenses of laboratory employees, grants will be at least \$500,000 per year to cover year-round salary plus research expenses. The research grants are planned for five years.

To be eligible for the DOE award, a researcher must be an untenured, tenure-track assistant or associate professor at a U.S. academic institution or a full-time employee at a DOE national laboratory, who received a Ph.D. within the past 10 years. Research topics are required to fall within one of the Department's Office of Science's six major program offices:

- Advanced Scientific Computing Research
- Basic Energy Sciences
- Biological and Environmental Research
- Fusion Energy Sciences
- High Energy Physics
- Nuclear Physics

Awardees were selected from a large pool of university- and national laboratory-based applicants. Selection was based on peer review by outside scientific experts. Projects announced today are selections for negotiation of financial award. The final details for each project award are subject to final grant and contract negotiations between DOE and the awardees.

A list of the 49 awardees, their institutions, and titles of research projects is appended and is also available on the Early Career Research Program webpage <http://science.energy.gov/early-career/>.

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Department of Energy Office of Science FY2015 Early Career Research Program

Albert, Félicie, Lawrence Livermore National Laboratory, Livermore, CA, "Laser Driven X-ray Sources for High Energy Density Science Experiments," selected by the Office of Fusion Energy Sciences.

Allison, Thomas K., SUNY Stony Brook University, Stony Brook, NY, "Ultrafast Dynamics of Molecules on Surfaces Studied with Time-Resolved XUV Photoelectron Spectroscopy," selected by the Office of Basic Energy Sciences.

Anna, Jessica M., University of Pennsylvania, Philadelphia, PA, "Tracking Photochemical and Photophysical Processes for Solar Energy Conversion via Multidimensional Electronic and Vibrational Spectroscopic Methods," selected by the Office of Basic Energy Sciences.

Baalrud, Scott D., University of Iowa, Iowa City, IA, "Transport Properties of Magnetized High-Energy-Density Plasma," selected by the Office of Fusion Energy Sciences.

Badu-Tawiah, Abraham K., The Ohio State University, Columbus, OH, "Visible Light Photo-Catalysis in Charged Micro-Droplets," selected by the Office of Basic Energy Sciences.

Barraza-Lopez, Salvador, University of Arkansas, Fayetteville, AR, "Quantum Phenomena in Few-Layer Group IV Monochalcogenides: Interplay among Structural, Thermal, Optical, Spin, and Valley Properties in 2D," selected by the Office of Basic Energy Sciences and the DOE Experimental Program to Stimulate Competitive Research.

Bruggeman, Peter J., University of Minnesota, Minneapolis, MN, "Non-Equilibrium Plasma-Interactions with Biomaterials, Biological Solutions and Tissues," selected by the Office of Fusion Energy Sciences.

Cheung, Alvin, University of Washington, Seattle, WA, "Using Verified Lifting to Optimize Legacy Stencil Codes," selected by the Office of Advanced Scientific Computing Research.

Ciston, Jim, Lawrence Berkeley National Laboratory, Berkeley, CA, "MAPSTER Microscopy: Multimodal Acquisition of Properties and Structure with Transmission Electron Reciprocal-space Microscopy," selected by the Office of Basic Energy Sciences.

Couch, Sean M., Michigan State University, East Lansing, MI, "The Core-collapse Supernova Sensitivity Machine," selected by the Office of Nuclear Physics.

Cusack, Daniela F., University of California, Los Angeles, Los Angeles, CA, "Consequences of Plant Nutrient Uptake for Soil Carbon Stabilization," selected by the Office of Biological and Environmental Research.

Du, Yingge, Pacific Northwest National Laboratory, Richland, WA, "Controlling Atomically Precise Ordering and Phase Transitions in Oxide Thin Films," selected by the Office of Basic Energy Sciences.

Engle, Jonathan W., Los Alamos National Laboratory, Los Alamos, NM, "Nuclear Data for Spallation Neutron Radioisotope Production," selected by the Office of Nuclear Physics.

Eremeev, Grigory V., Thomas Jefferson National Accelerator Facility, Newport News, VA, "Formation of Superconducting Nb₃Sn Phase for Superconducting Radio Frequency (SRF) Cavities," selected by the Office of Nuclear Physics.

Evangelista, Francesco A., Emory University, Atlanta, GA, “Advanced Electronic Structure Theories for

Strongly Correlated Ground and Excited States,” selected by the Office of Basic Energy Sciences.

Flint, Rebecca, Iowa State University, Ames, IA, “Exotic Kondo Phases: the Non-Kramers Doniach Phase

Diagram,” selected by the Office of Basic Energy Sciences.

Fout, Alison R., University of Illinois, Champaign, IL, “Bio-inspired Catalysts Featuring Earth Abundant Metals and Secondary Coordination Sphere Interactions for the Reduction of Oxyanions,” selected by the Office of Basic Energy Sciences.

Gates, Jacklyn M., Lawrence Berkeley National Laboratory, Berkeley, CA, “Mass Measurements and Decay Spectroscopy of the Heaviest Elements,” selected by the Office of Nuclear Physics.

Hahn, Kristian A., Northwestern University, Evanston, IL, “Dark Matter and Track Triggering with the CMS Experiment,” selected by the Office of High Energy Physics.

Hofmockel, Kirsten S., Pacific Northwest National Laboratory, Richland, WA, “Molecular Interactions of the Plant-Soil-Microbe Continuum of Bioenergy Ecosystems,” selected by the Office of Biological and Environmental Research.

Hong, Xia, University of Nebraska, Lincoln, NE, “Nanoscale Ferroelectric Control of Novel Electronic States in Layered Two-Dimensional Materials,” selected by the Office of Basic Energy Sciences and the DOE Experimental Program to Stimulate Competitive Research.

Hsu, Shih-Chieh, University of Washington, Seattle, WA, “Search for Dark Matter using mono-Higgs and the ATLAS Pixel Detector,” selected by the Office of High Energy Physics.

Humble, Travis S., Oak Ridge National Laboratory, Oak Ridge, TN, “Accelerating Applications of High-Performance Computing with Quantum Processing Units,” selected by the Office of Advanced Scientific Computing Research.

Jin, Yier, University of Central Florida, Orlando, FL, “Resilient and Robust High Performance Computing Platforms for Scientific Computing Integrity,” selected by the Office of Advanced Scientific Computing Research.

Kolasinski, Robert D., Sandia National Laboratories, Livermore, CA, “Characterizing the Dynamic Response of Surfaces to Plasma Exposure,” selected by the Office of Fusion Energy Sciences.

Kolemen, Egemen, Princeton University, Princeton, NJ, “Physics-Based Real-time Analysis and Control to Achieve Transient-Free Operations for the ITER Era,” selected by the Office of Fusion Energy Sciences.

Krogstad, Jessica A., University of Illinois, Champaign, IL, “Dynamic, Robust, Radiation-Resistant Ceramics: Harnessing Thermodynamic and Kinetic Driving Forces,” selected by the Office of Basic Energy Sciences.

Lehner, Christoph, Brookhaven National Laboratory, Upton, NY, “New Methods Enabling a Precise First-Principles Computation of the Muon Anomalous Magnetic Moment,” selected by the Office of High Energy Physics.

Mayes, Melanie A., Oak Ridge National Laboratory, Oak Ridge, TN, “A Comprehensive Framework for Modeling Emissions from Tropical Soils and Wetlands,” selected by the Office of Biological and Environmental Research.

McFarlane, Karis J., Lawrence Livermore National Laboratory, Livermore, CA, “Tropical Forest Response

to a Drier Future: Turnover Times of Soil Organic Matter, Roots, Respired CO₂, and CH₄ across Moisture Gradients in Time and Space,” selected by the Office of Biological and Environmental Research.

Mitchell, Chad, Lawrence Berkeley National Laboratory, Berkeley, CA, "Compensation of Nonlinear Space Charge Effects for Intense Beams in Accelerator Lattices," selected by the Office of High Energy Physics.

Moran, James J., Pacific Northwest National Laboratory, Richland, WA, "Spatially Resolved Rhizosphere Function: Elucidating Key Controls on Nutrient Interactions," selected by the Office of Biological and Environmental Research.

Muchero, Wellington, Oak Ridge National Laboratory, Oak Ridge, TN, "Host-Microbial Genetic Features Mediating Symbiotic Interactions in the Bioenergy Crop *Salix*," selected by the Office of Biological and Environmental Research.

Neidig, Michael L., University of Rochester, Rochester, NY, "Electronic Structure, Bonding and Reactivity in f-Element Chemistry," selected by the Office of Basic Energy Sciences.

Neilson, Jamie R., Colorado State University, Fort Collins, CO, "Informed Materials Design Principles from Local Structures and Dynamics In Hybrid Inorganic-Organic Perovskite Halides," selected by the Office of Basic Energy Sciences.

Nowack, Katja C., Cornell University, Ithaca, NY, "Magnetic Imaging of Topological Phases of Matter," selected by the Office of Basic Energy Sciences.

Peay, Kabir G., Stanford University, Palo Alto, CA, "Does Mycorrhizal Symbiosis Determine the Climate Niche for *Populus* as a Bioenergy Feedstock?," selected by the Office of Biological and Environmental Research.

Posen, Sam, Fermi National Accelerator Laboratory, Batavia, IL, "Developing the Next Generation of Superconducting RF Cavities with Nb_3Sn ," selected by the Office of High Energy Physics.

Raaf, Jennifer L., Fermi National Accelerator Laboratory, Batavia, IL, "Coming in from the Cold: A High-Pressure Gaseous Argon Time Projection Chamber as an Option for the DUNE Near Detector," selected by the Office of High Energy Physics.

Redshaw, Matthew, Central Michigan University, Mount Pleasant, MI, "High-precision Penning trap Measurements of β -decay Q-values for Neutrino Physics," selected by the Office of Nuclear Physics.

Rozo, Eduardo, University of Arizona, Tucson, AZ, "Constraining Dark Energy with Galaxy Clusters and Baryon Acoustic Oscillations," selected by the Office of High Energy Physics.

Schulman, Rebecca, The Johns Hopkins University, Baltimore, MD, "Resilient Hydrogels from the Nanoscale to the Macroscale," selected by the Office of Basic Energy Sciences.

Sharp, Ian D., Lawrence Berkeley National Laboratory, Berkeley, CA, "Overcoming Charge Transport Limitations in Thin Film Semiconductor Photoelectrodes," selected by the Office of Basic Energy Sciences.

Shaw, John B., University of Arkansas, Fayetteville, AR, "The Dynamics and Stratigraphy of Distributary Channel Networks," selected by the Office of Basic Energy Sciences and the DOE Experimental Program to Stimulate Competitive Research.

Tamboli, Adele C., National Renewable Energy Laboratory, Golden, CO, "Harnessing Order Parameter in Ternary II-IV-V₂ Semiconductors," selected by the Office of Basic Energy Sciences.

van Tilborg, Jeroen, Lawrence Berkeley National Laboratory, Berkeley, CA, "A Compact Laser-Plasma-Accelerator-Based FEL for Ultra-Fast Hyper-Spectral Experiments," selected by the Office of Basic Energy Sciences.

Webster, Clayton G., Oak Ridge National Laboratory, Oak Ridge, TN, "Mathematical Methods for

Optimal Polynomial Recovery of High-Dimensional Systems from Noisy Data,” selected by the Office of Advanced Scientific Computing Research.

Wen, Haidan, Argonne National Laboratory, Lemont, IL, “Understanding Mesoscale Nonequilibrium Heterogeneity by Multimodal X-ray Imaging,” selected by the Office of Basic Energy Sciences.

Wrede, Christopher, Michigan State University, East Lansing, MI, “Critical Thermonuclear Reactions in Classical Novae and Type I X-ray Bursts,” selected by the Office of Nuclear Physics.