

FY2020 Office of Science Early Career Research Program

Office	PI Name (Last, First)	Institution	City, State	Title
HEP	Ainsworth, Robert	Fermi National Accelerator Laboratory	Batavia, IL	Ensuring Bunch Stability in Multi-MW Beams
HEP	Asaadi, Jonathan	The University of Texas at Arlington	Arlington, TX	Discovery Science with New Multi-modal Pixel Based Noble Element Time Projection Chambers
BES	Azoulay, Jason	University of Southern Mississippi	Hattiesburg, MS	Gold Catalyzed Polymerization Reactions of Unsaturated Substrates: Towards New Functional, Recyclable, and Upcycled Aromatic Polymers
BES	Beckingham, Bryan	Auburn University	Auburn, AL	Transport of Complex Mixtures in Ion-containing Polymer Membranes
BES	Bediako, Daniel	The Regents of University of California	Berkeley, CA	Manipulating Interfacial Reactivity with Atomically Layered Heterostructures
NP	Bishop, Michael	Argonne National Laboratory	Lemont, IL	A Neutral-atom Quantum Simulator for Nuclear Physics
BES	Bridwell-Rabb, Jennifer	Regents of the University of Michigan	Ann Arbor, MI	Structural and Mechanistic Studies of O ₂ -dependent and O ₂ -independent Enzymes in Chlorophyll Biosynthesis
BES	Chan, Maria	Argonne National Laboratory	Lemont, IL	Theory-informed Artificial Intelligence for Accelerating Materials Characterization
NP	Chatzopoulos, Emmanouil	Louisiana State University and A&M College	Baton Rouge, LA	Modeling The Nucleosynthetic Imprint of Stellar Merger Phenomena
FES	Coppari, Federica	Lawrence Livermore National Laboratory	Livermore, CA	Expanding Capabilities to Unlock the Mysteries of Complex Warm Dense Matter
BES	Cordones-Hahn, Amy	SLAC National Accelerator Laboratory	Menlo Park, CA	Atomic View of Molecular Photocatalysis using X-ray Lasers
BES	Cotruvo, Joseph	The Pennsylvania State University	University Park, PA	Probing Lanmodulin's Mechanisms of Rare-earth Selectivity for Protein-based Bioseparations
BES	Devaraj, Arun	Pacific Northwest National Laboratory	Richland, WA	Coupled Effects of Stress and Hydrogen on Stress Corrosion Cracking of Fe-based Alloys
HEP	DUARTE, JAVIER	The Regents of the University of California - UCSD	La Jolla, CA	Real-Time Artificial Intelligence for Particle Reconstruction and Higgs Physics
NP	Duval, Christine	Case Western Reserve University	Cleveland, OH	A Rapid Membrane-based Approach for Medical Isotope Purification
BER	Emerson, Joanne	Regents of the University of California	Davis, CA	Infective Viruses and Inert Virions: Illuminating Abundant Unknowns in Terrestrial Biogeochemical Cycles
BES	Fang, Li	University of Central Florida	Orlando, FL	Probing Ultrafast XUV/x-ray Induced Electron Correlation in the Molecular Frame
FES	Field, Kevin	Regents of the University of Michigan	Ann Arbor, MI	Precipitate Stability and Helium Trapping in Advanced Steels
HEP	Fields, Laura	Fermi National Accelerator Laboratory	Batavia, IL	Precision Neutrino Fluxes for LBNF/DUNE
BES	Frandsen, Benjamin	Brigham Young University	Provo, UT	Probing Short-Range Structure and Magnetism In Next-Generation Energy Conversion Materials
NP	Garcia Ruiz, Ronald Fernando	Massachusetts Institute of Technology	Cambridge, MA	Laser Spectroscopy of Exotic Atoms and Molecules Containing Octupole-Deformed Nuclei
FES	Geiger, Benedikt	Board of Regents of the University of Wisconsin System	Madison, WI	Experimental Study of Turbulent Impurity Transport in 3D Magnetic Fields
BES	Gilbert, Dustin	The University of Tennessee	Knoxville, TN	Exotic Uses of Neutrons and X-rays as Probes for Chiral Magnets
FES	Gopalakrishnan, Ranganathan	University of Memphis	Memphis, TN	Thermodynamics and Transport Models of Strongly Coupled Dusty Plasmas
BES	Govoni, Marco	Argonne National Laboratory	Lemont, IL	Optical Control of Spin-polarization in Quantum Materials
HEP	Gray, Heather	The Regents of University of California	Berkeley, CA	Probing the Flavor Dependence of Higgs Couplings with Charm Tagging
BES	Gu, Wendy	Board of Trustees of the Leland Stanford Junior University	Stanford, CA	Deformation of Nano-Metallic Glasses Made using Colloidal Synthesis
BER	Hoffman, Matthew	Los Alamos National Laboratory	Los Alamos, NM	Creating a Sea-Level-Enabled E3SM: A critical capability for predicting coastal impacts
BES	Hu, Wanzheng	Trustees of Boston University	Boston, MA	Bidirectional Manipulation of Phase Transitions by Laser Excitation of Optical Phonons
FES	Humrickhouse, Paul	Idaho National Laboratory	Idaho Falls, ID	Toward a Technology-Inclusive Whole Device Model
HEP	Jarvis, Jonathan	Fermi National Accelerator Laboratory	Batavia, IL	Next-Generation Beam Cooling and Control with Optical Stochastic Cooling
BES	Jiang, Peter	Oak Ridge National Laboratory	Oak Ridge, TN	Realization of Full Neutron Polarization Control: Next Generation Spherical Neutron Polarimetry for Neutron Scattering
HEP	Jin, Luchang	University of Connecticut	Storrs, CT	Lattice Calculation of the QED Corrections to Meson Leptonic Decay
BES	Karkare, Siddharth	Arizona Board of Regents for Arizona State University	Tempe, AZ	High Brightness Photocathodes in Photoinjectors

BER	Keenan, Trevor	The Regents of University of California	Berkeley, CA	Extreme Drought, Heat and Wildfire Impacts on Coastal Water Relations
BES	Khemani, Vedika	Board of Trustees of the Leland Stanford Junior University	Stanford, CA	The Non-Equilibrium Quantum Frontier
BES	Lammers, Laura	Lawrence Berkeley National Laboratory	Berkeley, CA	Illuminating the Molecular Pathways of Trace Element Incorporation During Crystal Growth
NP	Leach, Kyle	Colorado School of Mines	Golden, CO	The BeEST: A Search for keV-Scale Sterile Neutrinos using Superconducting Quantum Sensors
HEP	Lippincott, Hugh	Regents of the University of California	Santa Barbara, CA	HydroX: Using Hydrogen Doped in Liquid Xenon to Search for Dark Matter
NP	Lovato, Alessandro	Argonne National Laboratory	Lemont, IL	A Unified Picture of Long- and Short-range Dynamics of Atomic Nuclei
BES	Manthiram, Karthish	Massachusetts Institute of Technology	Cambridge, MA	Electrocatalytic Alkene Epoxidation at Disrupted Metal Ensembles in Blended Electrolytes
FES	Martin, Elijah	Oak Ridge National Laboratory	Oak Ridge, TN	Investigation of Helicon and Lower Hybrid Wave Coupling with the Edge Plasma for Current Drive Optimization in the Tokamak Using Laser Spectroscopy
BES	Mason, Jarad	President and Fellows of Harvard College	Cambridge, MA	Converting Metal–Organic Liquids into Microporous Glasses via Non-Equilibrium Syntheses
BES	Milner, Phillip	Cornell University	Ithaca, NY	New Molecular Mechanisms for Greenhouse Gas Capture in Metal–Organic Frameworks: Carbon Dioxide and Beyond
HEP	Mooney, Michael	Colorado State University	Fort Collins, CO	Constraining the Electromagnetic Shower Energy Scale at LArTPC Neutrino Detectors Near and Far
BES	Moore, Gary	Arizona Board of Regents for Arizona State University	Tempe, AZ	Understanding and Controlling Multielectron, Multisubstrate Reactions Involving Complex Architectures and Interfaces
ASCR	Nicolae, Bogdan	Argonne National Laboratory	Lemont, IL	DataStates: Scalable Versioning for Scientific Data
BER	Nuccio, Erin	Lawrence Livermore National Laboratory	Livermore, CA	Crosstalk: Interkingdom interactions in the mycorrhizal hyphosphere and ramifications for soil C cycling
HEP	Oshea, Brendan	SLAC National Accelerator Laboratory	Menlo Park, CA	Improving Accelerators with Diagnostics Optimized for Artificial Intelligence
BER	Patricola, Christina	Iowa State University of Science and Technology	Ames, IA	Variability and Change in Tropical Cyclone Characteristics: Coupled Atmosphere–Ocean Drivers and Coastal Impacts
BES	Perras, Fred	Ames Laboratory	Ames, IA	Understanding the Dynamics of Single-Site Heterogeneous Catalysts
ASCR	Phillips, Bei	University of Utah	Salt Lake City, UT	Topology-Preserving Data Sketching for Scientific Visualization
BES	Plumb, Kemp	Brown University	Providence, RI	Deciphering Spin and Orbital Dynamics in Quantum Materials through Neutron Scattering
NP	Radice, David	The Pennsylvania State University	University Park, PA	Exascale Simulations of Neutron Star Mergers
BER	Roux, Simon	Lawrence Berkeley National Laboratory	Berkeley, CA	Characterizing Virus-driven Alterations of Microbial Metabolism in Model Soil Ecosystems
BES	Sambur, Justin	Colorado State University	Fort Collins, CO	Controlling Interfacial Energetics and Charge Transfer Rates in 2D Semiconductors: Fundamental Studies En Route to Photoelectrochemical Energy Conversion Beyond the Shockley-Queisser Limit
HEP	Samushia, Lado	Kansas State University	Manhattan, KS	Robust Dark Energy Constraints with Dark Energy Spectroscopic Survey
BES	Saparov, Bayram	Board of Regents of the University of Oklahoma	Norman, OK	Additive-Assisted Preparation of Multinary Halides
NP	Sato, Nobuo	Thomas Jefferson National Accelerator Facility	Newport News, VA	Next Generation of QCD Global Analysis for Hadronic Physics
NP	Shanahan, Phiala	Massachusetts Institute of Technology	Cambridge, MA	The QCD Structure of Nucleons and Light Nuclei
BES	Shepherd, James	University of Iowa	Iowa City, IA	Towards Exact Finite Temperature Electronic Structure in Solids and Molecules
HEP	Skinnari, Louise	Northeastern University	Boston, MA	Exploring the Energy Frontier through Precision Tests and Fast Tracking with the CMS Detector
HEP	Stanford, Douglas	Board of Trustees of the Leland Stanford Junior University	Stanford, CA	Quantum Black Holes and Wormholes
BER	Sulman, Benjamin	Oak Ridge National Laboratory	Oak Ridge, TN	Simulating Estuarine Wetland Function: Nitrogen Removal, Carbon Sequestration, and Greenhouse Gas Fluxes at the River-land-ocean Interface
BES	Sun, Dali	North Carolina State University	Raleigh, NC	Elucidating Chirality-induced Magnetism and Magnetoelectric Functionalities in Layered Chiral Hybrid Metal Halide Perovskites
BES	Sun, Wenhao	Regents of the University of Michigan	Ann Arbor, MI	Temperature-Time-Transformation (TTT) Diagrams for Predictive Solid-State Ceramic Synthesis

ASCR	Trask, Nathaniel	Sandia National Laboratories	Albuquerque, NM	Physics-informed Graph Neural Networks for Data-driven Multiscale Modeling
HEP	Troxel, Michael A.	Duke University	Durham, NC	Accurate Dark Energy Constraints via the Precise Characterization of Galaxy Intrinsic Alignment Coupled with Shear and Redshift Interference
ASCR	Van Rees, Wim	Massachusetts Institute of Technology	Cambridge, MA	A Multiresolution Sharp-interface Framework for Tightly-coupled Multiphysics Simulations
ASCR	Wang, Chen	University of Massachusetts Amherst	Hadley, MA	Enhancing Performance of Bosonic Qubits in Circuit QED with Reservoir Engineering
BES	Wang, Tuo	Louisiana State University and A&M College	Baton Rouge, LA	Atomic Resolution of Lignin-Carbohydrate Interactions in Native Plant Tissues from Solid-State NMR
ASCR	Wild, Stefan	Argonne National Laboratory	Lemont, IL	Structure-Exploiting, Adaptive, Zero-Order Optimization to Improve Efficiency
BES	Xin, Huolin	Regents of the University of California	Irvine, CA	Machine Learning Enabled Advanced Electron Tomography for Resolving Chemical Inhomogeneity and Materials Dynamics in Lithium-Ion Battery Electrodes
BES	Yi, Ming	William Marsh Rice University	Houston, TX	Deciphering and Manipulating Low Dimensional Magnetism
ASCR	Young, Kevin	Sandia National Laboratories	Livermore, CA	Quantum Performance Enhancement
HEP	Zhou, Tong	Lawrence Berkeley National Laboratory	Berkeley, CA	Multi-kHz Laser-plasma Accelerator Driven by Spectrally Combined Fiber Laser