FY 2019 Office of Science Early Career Program

Office	PI Name (Last, First)	Institution	City, State	Title
FES	Aluie, Hussein	University of Rochester	Rochester, NY	Scale-Aware Modeling of Instabilities and Mixing in HED Flows
BES	Argenti, Luca	University of Central Florida	Orlando, FL	New correlated numerical methods for attosecond molecular single and double ionization
BES	Augustyn, Veronica	North Carolina State University	Raleigh, NC	Probing Electrochemical Reactivity Under Nanoconfinement Using Molecularly Pillared Two Dimensional Materials
NP	Broussard, Leah	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Systematics of Precision Neutron Physics Experiments
BER	Burnum-Johnson, Kristin	Pacific Northwest National Laboratory (PNNL)	Richland, WA	Spatiotemporal mapping of lignocellulose decomposition by a naturally evolved fungal garden microbial consortium
HEP	Cavaliere, Viviana	Brookhaven National Laboratory (BNL)	Upton, NY	Boosting new physics searches with Higgs differential cross-section measurements
BES	Cheng, Lan	Johns Hopkins University	Baltimore, MD	Development of Novel Relativistic Electronic Structure Methods for Actinide-Containing Compounds
BES	Chi, Miaofang	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Probing Anionic Electron Behavior in Electrides
NP	Constantinou, Martha	Temple University	Philadelphia, PA	EIC physics from Lattice QCD
BES	Coridan, Robert	University of Arkansas	Fayetteville, AR	High-Efficiency Solar-To-Fuel Photoelectrochemistry in Disordered Photonic Glass Electrodes
BES	Cushing, Scott	California Institute of Technology	Pasadena, CA	Using Ultrafast Entangled Photon Correlations to Measure the Temporal Evolution of Optically Excited Molecular Entanglement
NP	Davoudi, Zohreh	University of Maryland	College Park, MD	Analog and Digital Quantum Simulations of Strongly Interacting Theories for Applications in Nuclear Physics
BES	Dishari, Shudipto	University of Nebraska-Lincoln	Lincoln, NE	Porin Inspired Ionomers with sub-nm Gated Ion Channels for High Ion Conductivity and Selectivity
HEP	Dumitrescu, Thomas	University of California, Los Angeles	Los Angeles, CA	New Tools for Strongly Coupled Quantum Field Theories
HEP	Dvorkin, Cora	Harvard University	Cambridge, MA	Discovering Dark Matter Clumps and Primordial Particles with Galaxies
HEP	Eifler, Tim	University of Arizona	Tucson, AZ	Multi-Probe Cosmology with DES and LSST
BES	Flaherty, David	University of Illinois	Champaign, IL	The Role of Cooperative Interactions Among Surfaces, Solvents, and Reactive Intermediates on Catalysis at Liquid-Solid Interfaces
NP	Foucart, Francois	University of New Hampshire	Durham, NH	Nuclear Astrophysics through simulations of neutron star mergers using Monte-Carlo neutrino radiation transport
BES	Gadikota, Greeshma	Cornell University*	Ithaca, NY	Mechanistic Tuning of Chemical Transformations for Coupling the Geo-mimicry of Acid Gas Storage with Design Strategies to Produce Clean Energy Carriers in Multi-Phase Reaction Environments (MATTER) **Proposal originally submitted by the University of Wisconsin*
HEP	Gamzina, Diana	SLAC National Accelerator Laboratory	Menlo Park, CA	Mechanics of Materials' Interaction with Electromagnetic Waves in Accelerator Cavities
FES	Gleason, Arianna	SLAC National Accelerator Laboratory	Menlo Park, CA	Ultrafast visualization of hydrodynamic evolution: understanding void collapse at extreme high-pressure conditions
HEP	Gollapinni, Sowjanya	University of Tennessee	Knoxville, TN	Development of a Laser Calibration System for the DUNE Far Detector
FES	Hammond, Karl	University of Missouri	Columbia, MO	Lithium–Divertor Interactions and Helium/Hydrogen Trapping in Lithiated Metals
NP	Hen, Or	Massachusetts Institute of Technology	Cambridge, MA	Study of Short-Range Correlations in Nuclei Using Electro-induced Nucleon-knockout Reactions at High Momentum-Transfer
HEP	Hertel, Scott	University of Massachusetts, Amherst	Hadley, MA	Optimization and Calibration of a 4He-based Detector for Low-Mass Dark Matter
BES	Hicks (Matson), Ellen	University of Rochester	Rochester, NY	Modeling electronic interactions and multielectron reactivity of actinide ions on metal-oxide surfaces: Synthesis, characterization, and reactivity of actinide-functionalized polyoxovanadates
BES	Huang, Jier	Marquette University	Milwaukee, WI	Design and Structural Analyses of 2D COFs as Single-Site CO2 Reduction Catalysts
ASCR	Idreos, Stratos	Harvard University	Cambridge, MA	Data Structure Alchemy
HEP	Jeanty, Laura	University of Oregon	Eugene, OR	Searches for New Long-Lived Particles and Upgrade to the ATLAS Inner Detector
BES	Jungfleisch, M. Benjamin	University Of Delaware	Newark, DE	Emergent properties of magnons coupled to microwave photons
BES	Katoch, Jyoti	Carnegie Mellon University	Pittsburgh, PA	Tunable Energy Landscape, Non-trivial Band Topology, and Electric Field Driven Phenomena in Novel Quantum Materials as Probed by Localized Photoemission Spectroscopy

ASCR	Kim, Kibaek	Argonne National Laboratory (ANL)	Lemont, IL	Data-Driven Optimization under Uncertainty: Parallel Algorithms and Solver
HEP	Krause, Elisabeth	University of Arizona	Tucson, AZ	Joint analyses of lensing, clustering, and galaxy clusters with DES and LSST
BER	Larsen, Isaac	University of Massachusetts, Amherst	Amherst, MA	Abiotic and biotic controls on chemical weathering rates and solute generation
BES	Limmer, David	University of California, Berkeley	Berkeley, CA	Understanding and controlling photoexcited molecules in complex environments
BES	Lindsay, Lucas	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Elucidating the Nature of Chiral and Topological Phonons in Materials for Energy Technologies
BES	Lubner, Cara	National Renewable Energy Laboratory (NREL)	Golden, CO	Elucidating the Mechanistic Determinants of Flavin-Based Electron Bifurcation
ASCR	Lukens, Joe	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Scalable Architectures for Hybrid Quantum/Classical Networking
HEP	Machado, Pedro Accioly Nogueira	Fermi National Accelerator Laboratory (FNAL)	Batavia, IL	The next revolution in neutrino physics
ASCR	Manucharyan, Vladimir	University of Maryland	College Park, MD	Realization of a Quantum Slide Rule for 1+1 Dimensional Quantum Field Theories Using Josephson Superconducting Circuits
BES	Maxson, Jared	Cornell University	Ithaca, NY	Control of Bright Electron Beams at Small Spatiotemporal Scales for Probing Materials Far from Equilibrium
FES	McBride, Ryan	University of Michigan	Ann Arbor, MI	The Physics of Micro-Pinches
BER	Michener, Josh	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Systems metabolic engineering of Novosphingobium aromaticivorans for lignin valorization
ASCR	Mohror, Kathryn	Lawrence Livermore National Laboratory (LLNL)	Livermore, CA	I/O Workload Characterization for Performance and Portability
NP	Palczewski, Ari	Thomas Jefferson National Accelerator Facility (TJNAF)	Newport News, VA	Developing the surface engineering basis for next-generation SRF accelerators
BES	Ramshaw, Brad	Cornell University	Ithaca, NY	Ultrasonic Determination of Electron Viscosity and Hydrodynamics in Metals
ASCR	Rubio Gonzalez, Cindy	University of California, Davis	Davis, CA	Towards Scalable Precision Tuning of Numerical Software
BES	Salamat, Ashkan	University of Nevada, Las Vegas	Las Vegas, NV	The synthesis of metal superhydrides through extreme temperature/pressure conditions: towards room temperature superconductivity
NP	Saldanha, Richard	Pacific Northwest National Laboratory (PNNL)	Richland, WA	Enhancing the Discovery Potential of the nEXO Neutrinoless Double Beta Decay Experiment
BER	Salvachua Rodriguez, Davinia	National Renewable Energy Laboratory (NREL)	Golden, CO	Elucidating Aromatic Catabolic Pathways in White-Rot Fungi during Lignin Decay
ASCR	Schuman, Catherine	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Learning to Learn: Designing Novel Neuromorphic Algorithms with Machine Learning
ASCR	Shields, Michael	Johns Hopkins University	Baltimore, MD	Low-dimensional manifold learning for uncertainty quantification in complex multi-scale stochastic systems
BER	Solomon, Kevin	Purdue University	West Lafayette, IN	Genetic tools to optimize lignocellulose conversion in anaerobic fungi and interrogate their genomes
HEP	Sorensen, Peter	Lawrence Berkeley National Laboratory (LBNL)	Berkeley, CA	Tagging radon daughter backgrounds in a crystalline xenon TPC: a solid future for the LZ dark matter search experiment
BER	Stegen, James	Pacific Northwest National Laboratory (PNNL)	Richland, WA	Multi-Watershed Perturbation-Response Traits Derived Through Ecological Theory
FES	Stoltzfus-Dueck, Timothy	Princeton Plasma Physics Laboratory (PPPL)	Princeton, NJ	Development and Testing of Reduced Models of the Edge Radial Electric Field
FES	Thimsen, Elijah	Washington University	St. Louis, MO	Structure of Plasma-Water Interface
BES	Thompson, Jeffrey	Princeton University	Princeton, NJ	Coherent control of strongly interacting spins in the solid-state
BES	Tonks, Ian	University of Minnesota	Minneapolis, MN	Catalytic Alkene Hydroesterification: New Tools for Polyester Synthesis and Beyond
HEP	Tran, Nhan	Fermi National Accelerator Laboratory (FNAL)	Batavia, IL	Deep learning acceleration of the boosted Higgs program and HEP computing
BES	Uysal, Ahmet	Argonne National Laboratory (ANL)	Lemont, IL	Mechanistic Understanding of Heavy Ion Adsorption, Chemistry, and Separations at Graphene Based 2D Materials Interfaces
BER	Varadharajan, Charuleka	Lawrence Berkeley National Laboratory (LBNL)	Berkeley, CA	Investigating the Impacts of Streamflow Disturbances on Water Quality using a Data-Driven Framework
BES	Vinyard, David	Louisiana State University and A&M College	Baton Rouge, LA	Assembly and Repair of the Photosystem II Reaction Center
BES	Wang, Bin	University of Oklahoma	Norman, OK	Catalysis Driven by Confined Hot Carriers at the Liquid/Metal/Zeolite Interface
BES	Wang, Yangyang	Oak Ridge National Laboratory (ORNL)	Oak Ridge, TN	Fingerprinting Macromolecular Flow and Deformation with Neutrons
BES	Watzman, Sarah	University of Cincinnati	Cincinnati, OH	Weyl Semimetals for High-Thermopower Transverse Thermoelectric Transport

BES	Wharry, Janelle	Purdue University	West Lafayette, IN	Irradiation Tailoring of Deformation-Induced Phase Transformation
HEP	Xu, Jingke	Lawrence Livermore National Laboratory (LLNL)	Livermore, CA	Pursuing the ultimate power of xenon dark matter detectors
HEP	Xu, Xingchen	Fermi National Accelerator Laboratory (FNAL)	Batavia, IL	Development of next-generation Nb3Sn superconductors for energy-frontier circular colliders
BES	Yan, Qimin	Temple University	Philadelphia, PA	Synthesis of motif and symmetry for accelerated learning, discovery, and design of electronic structures for energy conversion applications
BES	Zakutayev, Andriy	National Renewable Energy Laboratory (NREL)	Golden, CO	Kinetic Synthesis of Metastable Nitrides
BES	Zeljkovic, Ilija	Boston College	Chestnut Hill, MA	Atomic-scale Imaging of Magnetic and Electronic Orders in Complex Oxides
NP	Zhang, Jiehang	New York University	New York, NY	Exploring Quantum Many-body Physics with a Trapped Ion Quantum Information Processor