LDRD FY2023 Funded Proposals

LDRD Proj. No.	Project Title	P.I.	Dept.	Directorate
20-010	Developing Sub-Picosecond Multi-Terrawatt CO2 Laser Capability	Pogorelsky, Igor	AF	ATRO
20-031	Intelligent Quantum Dot Growbot for high throughput targeted quantum materials discovery	Ghose, Sanjit K	PS	EPS
20-038	Machine Learning for Real-Time Data Fidelity, Healing, and Analysis for Coferent X-ray Synchrotron Data	Barbour, Andi M	PS	EPS
20-041	Conceptual Design options for future upgrade of NSLS-II facility	Smalyuk, Victor	PS	EPS
21-001	Development of wavelength conversion techniques for generation of coherent radiation at the XUV to LWIR	Polyanskiy, Mikhail	AF	ATRO
21-013	Development of an integrated multi-scale bioimaging capability	Liu, Qun	BI	EBNN
21-020	Electron Microscopy Monolithic Active Pixel Sensors (EMMAPS) for Structural Biology	Deptuch, Grzegorz W	IO	ATR
21-021	Free Space Optical Link for Entangled Photon Distribution Over Long Distances	Haupt, Justine E	IO	ATRO
21-023	Towards Edge Computing: A Software and Hardware Co-Design Methodology for ASIC-based Scientific Neuromorphic Computing	Miryala, Sandeep	IO	ATRO
21-025	Demonstration of quantum transduction from superconducting cavity to atomic vapor	Stankus, Paul W	IO	ATRO
21-029	Bridging the Gap between Scientific Simulations and Experiments with Cycle-Consistent Generative Models	Ren, Yihui	CC	CSI
21-032	Development of a Planning, Operation, and Control Framework for Hybrid Energy Storage and Renewable Generation Systems	Yue, Meng	IS	EPS
21-033	Interpretable Machine-Learning Aided Design of Dynamic Reaction Experiments	Wu, Qin	NC	EPS
21-035	Observing time-resolved protein function using serial synchrotron crystallography	Fuchs, Martin R	PS	EPS
21-037	Laser Switching to Hidden Phases in Quantum Materials	Pelliciari, Jonathan	PS	EPS
21-038	Laying the Foundation for an Integrated Center for Sequence-to-Function Discovery	Yang, Lin	PS	EPS
21-039	Quantum techniques for advanced atmospheric lidar	Tsang, Thomas	IO	ATRO
21-045S	The study of nucleon structure	Gao, Haiyan	DB	NPP
22-007	A novel pathway for polyunsaturated fatty acid synthesis	Keereetaweep, Jantana	BI	EBNN
22-008	Machine Learning/Artificial Intelligence for Quantitative Plant Biology	Liu, Qun	BI	EBNN
22-011	Using Fluorescent Tags to Remotely Investigate Aerosol Activation in a Cloud Chamber	Sedlacek III,Arthur	EE	EBNN
22-012	Single-particle Mass Spectrometry of Atmospheric Aerosols	Zawadowicz, Maria A	EE	EBNN
22-013	High-Gradient Permanent Magnets for Emerging Accelerator Applications	Brooks, Stephen J	AD	NPP
22-018	Real-time Image Classification using Machine Learning	Brost, Elizabeth C	PO	NPP
22-022	One picosecond timing to probe time-energy entanglement of photons and to study longitudinal beam profiles at NSLS-II and EIC	Nomerotski, Andrey	PO	NPP
22-027	Probing the nucleon spin structure with quantum entanglement	Tu, Zhoudunming	PO	NPP
22-028	Assessment of FEL options for NSLS-II upgrade	Yu,Li Hua	PS	EPS
22-029	Towards ultrafast electron microscope with nanometer resolution	Yang, Xi	PS	EPS
22-031	Simulation-aided Instrument Optimization using Artificial Intelligence and Machine Learning Methods	Rakitin, Maksim S	PS	EPS
22-034	Coherent x-ray detection of dynamics associated with topological phases in quantum matter	Chen, Xiaoqian M	PS	EPS
22-037	Multimodal Cells for Operando Characterization of Photoelectrochemical Systems	Head,Ashley L	NC	EPS

LDRD Proj. No.	Project Title	P.I.	Dept.	Directorate
22-040	Advancing the State of Muon Collider Concepts for the US Snowmass/P5 Process and Engagement with the European Strategy	Palmer, Mark A	AF	ATRO
22-044	Diamond Neutron Imager	Muller, Erik	IO	ATRO
22-050	Trapping Noble Gases in Silicate Nanocages for Medical Isotopes, Nuclear Energy, and Nuclear Nonproliferation	Sanders, Vanessa	AD	NPP
22-053	Advancing FASSt-Simulation: A Novel Computational Framework for Model-Measurement Integration for Climate Prediction	Kuang, Chongai	EE	EBNN
22-054	Advancing FASSt-Sensing: Laying the foundations of the next generation observing systems and first light science in aerosol-cloud processes	Kollias, Pavlos	EE	EBNN
22-057	Multi-modal Characterization and Machine Learning Enabling Rapid Development of Scalable Battery Technology for a Clean Energy Future	Marschilok, Amy	IS	EPS
22-059	Precision synthesis of multiscale nanomaterials through AI-guided robotics for advanced catalysts	Zhang, Yugang	NC	EPS
22-062	Eureka!	McSweeney, Sean	PS	EPS
22-063	Full-scale demonstration of high-gradient Complex Bend element for NSLS-II upgrade	Sushil, Sharma	PS	EPS
22-065	Overcoming the Computational Bottlenecks of Particle-Resolved Direct Numerical Simulation with High Performace Computing and Machine Learning	Lin, Meifeng	CC	CSI
22-070	Investigation of Advanced Radiofrequency Microelectronic Platforms	O'Connor, Paul	IO	ATRO
22-076	Project 48	Schoonen, Martin	DJ	EBNN
23-007	High repetition rate Lithium Laser Ion Source for neutron beam production	Shunsuke Ikeda	AD	NPP
23-013	Physics and simulations of very high energy neutrino fluxes and events from LHC collisions in the HL-LHC era.	Milind Diwan	PO	NPP
23-014	Data Popularity, Placement Optimization and Storage Usage Effectiveness at the Data Center	Qiulan Huang	PO	NPP/CSI
23-016	3-D structure of the proton: from partons to strong fields	Yacine Mehtar-Tani	PO	NPP
23-019	R&D for PIONEER: a Next-generation Rare Pion Decay Experiment	Vladimir Tishchenko	PO	NPP
23-021	Utilizing AI/ML and automation systems to inform and optimize isotope separations	Jasmine Hatcher-Lamarre	AD	NPP/CSI
23-023	Direct Wind High Field Performance and Harmonic Study	Brett Parker	AM	ATRO/EIC
23-026	Entangling multiplexed atomic quantum sensors	Julián Martínez-Rincón	IO	ATRO
23-028	Nonlinear On-Chip Waveform Processing for Detector ASICs	Soumyajit Mandal	IO	ATRO
23-030	Radiolytically Generated Spin-Correlated Radical Pairs for Molecular QIS	Tomoyasu Mani	CO	EPS
23-039	Extensible robotic beamline scientist for self-driving total scattering studies	Phillip Maffettone	PS	EPS
23-043	Hybrid Digital-Analog Quantum Algorithms	Layla Hormozi	CSI	CSI
23-045	Novel Climate-Energy Sector modeling framework to project energy demands and infrastructure resiliency in urban environments	Michael Jensen	EE	EBNN
23-046	Examining Novel Isotope Production Pathways for a Medium to High Energy Cyclotron	J. Hatcher-Lamarre	AD	NPP
23-048	Real-time Information Distillation on Novel AI Hardware	Jin Huang	PO	NPP/CSI
23-049	Capturing Leadership at the Future Higgs Factory for BNL	Marc-André Pleier	PO	NPP/ATRO
23-050	A Second EIC Detector: Physics Case and Conceptual De-sign	T. Ullrich	PO	NPP

LDRD Proj. No.	Project Title	P.I.	Dept.	Directorate
23-051	RBRC research from RHIC to the EIC	David Morrison	PO	NPP
23-053	Hydrogen Research: Design, Engineer, Materialize, and Operationalize (H2 Research DEMO)	Rebecca Trojanowski	IS	EPS
23-058	Dual Calorimetry and 6-D Tracking with LAr TPC for Physics Discovery	Sergio Rescia (IO, PI) Shanshan Gao (PO, co-PI)	IO/PO	ATRO/NPP
23-060	eCRA: A COMPACT EFFICIENT ELECTRON ACCELERATOR FOR SECURITY AND MEDICINE	Mikhail Fedurin	ATF/A	ATRO/NPP
23-061	Towards Quantum Teleportation Services between Quantum Processors	Eden Figueroa	IO	ATRO