LDRD FY22 Funded Projects

LDRD Proj. No.	Project Title	P.I.	Dept.	Directorate
LDRD19-010	X-Ray Vision of Topological Bosons in Condensed Matter	DEAN,MARK PM	PM	EPS
LDRD19-013	In operando imaging and dynamics of 2D high temperature superconductor based, dense Q-bit arrays	MAZZOLI,CLAUDIO	PS	EPS
LDRD19-024	Quantum UV Sensors based on Superconducting Nanowire Single Photon Detector	RESCIA,SERGIO	IO	ATRO
LDRD19-027	Real-time Particle tracking with Deep Learning on FPGAs	CAVALIERE,VIVIANA	PO	NPP
LDRD19-028	High-Throughput Advanced Data Acquisition for eRHIC, Particle Physics and Cosmology Experiments	HUANG,JIN	PO	NPP
LDRD20-002	Advancing Atmospheric Prediction Capabilities in Urban Areas for Energy Resiliency and National Security	VOGELMANN,ANDREW M	EE	EBNN
LDRD20-008	Power Efficient Plasma Device for removal of PFASs, 1,4 Dioxane and other contaminants of emerging concerns from water supply	HERSHCOVITCH,ADY	AD	NPP
LDRD20-010	Developing Sub-Picosecond Multi-Terrawatt CO2 Laser Capability	POGORELSKY,IGOR	AF	ATRO
LDRD20-018	Building a Quantum Repeater Prototype Connecting BNL to NYC	FIGUEROA BARRAGAN,ED	IO	ATRO
LDRD20-022	Topical Error Correcting Codes in the NISQ Era	HORMOZI,LAYLA	CC	CSI
LDRD20-024	Quantum Machine Learning for dissipative Dynamics of NISQ devices	FANG,YAO LUNG	CC	CSI
LDRD20-029	Unraveling the Elusive Active Site Structures of Membrane Bound Non-Heme Diiron Enzymes	ERTEM,MEHMED Z	CO	EPS
LDRD20-030	Robust physics-informed machine learning applications in spectro-imaging and microscopy	GE,MINGYUAN	PS	EPS
LDRD20-031	Intelligent Quantum Dot Growbot for high throughput targeted quantum materials discovery	GHOSE,SANJIT K	PS	EPS
LDRD20-032	Accelerating materials discovery with total scattering via machine learning	OLDS,DANIEL P	PS	EPS
LDRD20-038	Machine Learning for Real-Time Data Fidelity, Healing, and Analysis for Coferent X-ray Synchrotron Data	BARBOUR,ANDI M	PS	EPS
LDRD20-039	Electrochemical Systems for Large Scale Energy Storage	TAKEUCHI,ESTHER S	IS	EPS
LDRD20-041	Conceptual Design options for future upgrade of NSLS-II facility	SMALYUK,VICTOR	PS	EPS
LDRD21-001	Development of wavelength conversion techniques for generation of coherent radiation at the XUV to LWIR	KUPFER, ROTEM	AF	ATRO
LDRD21-006	Development of In Vitro Analysis Methodologies for Novel Radioisotopes Produced at the Brookhaven Linac Isotope Producer	SANDERS, VANESSA	AD	NPP
LDRD21-009	Near-threshold quarkonium production and the mechanical properties of the proton	HATTA,YOSHITAKA	PO	NPP
LDRD21-013	Development of an integrated multi-scale bioimaging capability	LIU,QUN	BI	EBNN
LDRD21-014	Transcriptional co-regulation of lignin biosynthesis, growth and defense	XIE,MENG	BI	EBNN
LDRD21-020	Electron Microscopy Monolithic Active Pixel Sensors (EMMAPS) for Structural Biology	DEPTUCH,GRZEGORZ W	IO	ATRO
LDRD21-021	Free Space Optical Link for Entangled Photon Distribution Over Long Distances	HAUPT,JUSTINE E	IO	ATRO
LDRD21-022	Precision Synchronization of Multi-Sensor Distributed Networks	FRIED,JACK	IO	ATRO

LDRD Proj. No.	Project Title	P.I.	Dept.	Directorate
LDRD21-023	Towards Edge Computing: A Software and Hardware Co-Design Methodology for ASIC-based Scientific Neuromorphic Computing	MIRYALA,SANDEEP	IO	ATRO
LDRD21-025	Demonstration of quantum transduction from superconducting cavity to atomic vapor	STANKUS,PAUL W	IO	ATRO
LDRD21-029	Bridging the Gap between Scientific Simulations and Experiments with Cycle-Consistent Generative Models	REN,YIHUI	CC	CSI
LDRD21-031	Designing rechargeable Zn-air batteries in aqueous electrolytes using noble metal-free bifunctional electro-catalysts for grid-scale energy storage (GES)	WANG,LEI	IS	EPS
LDRD21-032	Development of a Planning, Operation, and Control Framework for Hybrid Energy Storage and Renewable Generation Systems	YUE,MENG	IS	EPS
LDRD21-033	Interpretable Machine-Learning Aided Design of Dynamic Reaction Experiments	WU,QIN	NC	EPS
LDRD21-035	Observing time-resolved protein function using serial synchrotron crystallography	FUCHS,MARTIN R	PS	EPS
LDRD21-037	Laser Switching to Hidden Phases in Quantum Materials	PELLICIARI,JONATHAN	PS	EPS
LDRD21-038	Laying the Foundation for an Integrated Center for Sequence-to-Function Discovery	YANG,LIN	PS	EPS
LDRD21-039	Quantum techniques for advanced atmospheric lidar	TSANG,THOMAS Y F	IO	ATRO
LDRD21-042	A Path forward to retain BNL's Leadership in EIC Science	ASCHENAUER,ELKE C	PO	NPP
LDRD21-044	DEDUCE: Differentiated Evaluation to Decrease Uncertainty in Computational Experiment	YOON,BYUNG JUN	CC	CSI
LDRD21-045S	The study of nucleon structure	GAO,HAIYAN	DB	NPP
LDRD21-046	Progress Toward a Resilient, Lower Carbon Electric Grid via Improved Forecasting	MARSCHILOK,AMY	IS	EPS
LDRD22-007	A novel pathway for polyunsaturated fatty acid synthesis	KEEREETAWEEP,JANTANA	BI	EBNN
LDRD22-008	Machine Learning/Artificial Intelligence for Quantitative Plant Biology	LIU,QUN	BI	EBNN
LDRD22-011	Using Fluorescent Tags to Remotely Investigate Aerosol Activation in a Cloud Chamber	SEDLACEK III,ARTHUR	EE	EBNN
LDRD22-012	Single-particle Mass Spectrometry of Atmospheric Aerosols	ZAWADOWICZ,MARIA A	EE	EBNN
LDRD22-013	High-Gradient Permanent Magnets for Emerging Accelerator Applications	BROOKS,STEPHEN J	AD	NPP
LDRD22-018	Real-time Image Classification using Machine Learning	BROST,ELIZABETH C	PO	NPP
LDRD22-022	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
LDRD22-027	Probing the nucleon spin structure with quantum entanglement	TU,ZHOUDUNMING	PO	NPP
LDRD22-028	Assessment of FEL options for NSLS-II upgrade	YU,LI HUA	PS	EPS
LDRD22-029	Towards ultrafast electron microscope with nanometer resolution	YANG,XI	PS	EPS
LDRD22-031	Simulation-aided Instrument Optimization using Artificial Intelligence and Machine Learning Methods	RAKITIN,MAKSIM S	PS	EPS
LDRD22-034	Coherent x-ray detection of dynamics associated with topological phases in quantum matter	CHEN,XIAOQIAN M	PS	EPS
LDRD22-037	Multimodal Cells for Operando Characterization of Photoelectrochemical Systems	HEAD,ASHLEY L	NC	EPS

LDRD Proj. No.	Project Title	P.I.	Dept.	Directorate
LDRD22-040	Advancing the State of Muon Collider Concepts for the US Snowmass/P5 Process and Engagement with the European Strategy	PALMER,MARK A	AF	ATRO
LDRD22-044	Diamond Neutron Imager	MULLER,ERIK M	IO	ATRO
22-050	Trapping Noble Gases in Silicate Nanocages for Medical Isotopes, Nuclear Energy, and Nuclear Nonproliferation	SANDERS,VANESSA A	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	HOUSEL,LISA M	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 M	PS	EPS
22-063	Full-scale demonstration of high-gradient Complex Bend element for NSLS-II upgrade	SHARMA,SUSHIL K	PS	EPS
22-065	Overcoming the Computational Bottlenecks of Particle-Resolved Direct Numerical Simulation with High Performance Computing and Machine Learning	LIN, MEIFENG; LI, LINGDA	CC	CSI
22-070	Investigation of Advanced Radiofrequency Microelectronic Platforms	O'CONNOR,PAUL	IO	ATRO
22-075	Preparations for the Demonstration of a Novel High-current Electron Cyclotron Resonance Accelerator for Security, Medical and Science Applications [1-year proposal]	FEDURIN,MIKHAIL G	AF	ATRO
22-076	Project 48	SCHOONEN,MARTIN A	DJ	EBNN
22-077	Entangling sets of quantum memories for quantum sensing	MARTINEZ-RINCON, JULIAN; FIGUEROA, EDEN	IO	ATRO