CINT 2018B Accepted Projects

Title; PI Name, PI Institution: *Lead CINT Scientist*

2D THz spectroscopy of fractional excitations in quantum magnets; Peter Armitage, Johns Hopkins University: *Rohit Prasankumar.*

3D Metafilm Optics; Bruce Burckel, Sandia National Laboratories: *Igal Brener.*

A pyrite FeS2 homojunction solar cell by ion implantation; Chris Leighton, University of Minnesota: *Yongqiang Wang.*

Ab initio Modeling of Halide Perovskites for Optoelectronic Properties; Amanda Neukirch, Los Alamos National Laboratory: *Sergei Tretiak.*

Assessment of photosensitizer induced oxidation of amyloid fibrils; Eva Chi, University of New Mexico: *Mary Elizabeth (Lisa) Phipps.*

Atomic-level controlling and understanding of surface effects to the fluorescence properties of color centers in nanodiamond particles; Shery Lan-Yun Chang, Arizona State University: *Dale Huber*.

Biomechanics of Hierarchically-Structured Enamel in Grinding Dentitions: An Evolutionary-Guided Route to Designing Damage Tolerant Material; Siddhartha (Sid) Pathak, University of Nevada, Reno: *Stephen Doorn.*

Carbon nanotubes as single-photon sources for quantum telecommunications: Christophe Voisin, Ecole Normale Superieure: *Stephen Doorn*.

Characterization of Heat Generation from Electron-Beam of SEM; Yanbao Ma, University of California at Merced: *Michael Pettes*.

Characterization of Structural and Electronic Response of Layered materials to Mechanical and Chemical Environments; Avinash Dongare, University of Connecticut: *Michael Pettes*.

Charge noise characterization and mitigation for semiconducting qubits; Daniel Ward, Sandia National Laboratories: *Tom Harris*.

Chemo-Mechanical Coupling at the Fluid-Rock Interface in Geomaterials; Hongkyu Yoon, Sandia National Laboratories: *Katie Jungjohann*.

CINT User Proposal –Nanostructured Negative-Thermal-Expansion Composites for Encapsulation of High-Priority Radionuclides; Eunja Kim, University of Nevada, Las Vegas: *Remi Dingreville*.

CNT exciton-polariton light sources; Mark Steger, National Renewable Energy Laboratory: *Stephen Doorn*.

Coherence of Single Hole Spins in GaAs; Lisa Tracy, Sandia National Laboratories: *John Reno.*

Coherent transport in polymers: Establishing materials design criteria and predicting structure/property interrelations; Carlos Silva, Georgia Institute of Technology: *Sergei Tretiak*.

Conducting Ceramic Nanophotonics; Michael Wood, Sandia National Laboratories: *Willie Luk*

Continuation of In Situ SAXS on Semi-Crystalline Polymers under Tensile Deformation; Cynthia Welch, Los Alamos National Laboratory: *Millie Firestone*.

Continuation of Thermoelectricity in a Luttinger Liquid; Guillaume Gervais, McGill University: *Mike Lilly*.

Controlled Self-Assembly of Photo Active Nanomaterials; Feng Bai, Henan University: *Hongyou Fan*.

Copy of Measuring the Energy Stored in Irradiated Tungsten; Osman El Atwani, Los Alamos National Laboratory: *Sergei Ivanov*.

Copy of Ultrafast Spectroscopy of the Long-Term Stable Plasmonic Transition Metal Nitride Nanoparticles; Sanchari Chowdhury, New Mexico Institute of Mining and Technology: *Rohit Prasankumar.*

Coupling of Two-Dimensional Materials to Metasurfaces and Nanostructured Media; Michael Goldflam, Sandia National Laboratories: *Igal Brener.*

Cyclic Materials and Mechanical Response of Additively Manufactured Ni-based Superalloys; Shuai Shao, Louisiana State University*: Nan Li.*

Deep reactive ion etched silicon devices for acoustofluidic bioanalysis; Menake Piyasena, New Mexico Tech: *Sergei Ivanov.*

Design and Engineering of Optical Nano-Materials Based on Organic Branched Structures; Vladimir Chernyak, Wayne State University: *Sergei Tretiak.*

Determining the Stress-Strain Response of Ion-Irradiated Zirconium via Spherical Nanoindentation; Siddhartha (Sid) Pathak, University of Nevada, Reno: *Yongqiang Wang.*

Deterministic Targeted Creations of Diamond Group-IV Defects; Dirk Englund, Massachusetts Institute of Technology: *Edward Bielejec*.

Development state of the art computational methods with neural networks; Olexandr Isayev, University of North Carolina at Chapel Hill: *Sergei Tretiak.*

Development, Testing, and Application of Rigorous Trajectory-Based Methods for Simulation of Nonadiabatic Dynamics; Craig Martens, University of California at Irvine: *Sergei Tretiak.*

Dielectric Permittivity of Polymer Nanocomposites; Rajiv Kalia, University of Southern California: *Gary Grest.*

Disorder enhanced interfacial phoning coupling; Chrstopher Saltonstall, Sandia National Laboratories: *Khalid Hattar.*

Dynamics in Quantum Materials Initiated with Circularly Polarized Terahertz Pulses; Richard Averitt, University of California, San Diego: *Hou-Tong Chen*.

Dynamics of electronic excitations in quasi-one-dimensional systems; Susan Dexheimer, Washington State University: *Stuart Trugman.*

Effect of Irradiation Defect Accumulation at Nanostructured Boundaries; Chaitanya Deo, Georgia Institute of Technology: *Remi Dingreville.*

Effects of doping and external bias on the bandgap, domain structure and carrier transport in multiferroic BiFeO3 film; Jung-Kun Lee, University of Pittsburgh: *Aiping Chen.*

Electrically-driven single photon sources based on carbon nanotubes; Ralph Krupke, Karlsruhe Institute of Technology (KIT): *Stephen Doorn.*

Electrocatalysis with Gold Nanoclusters and Nano-alloys; Plamen Atanassov, University of California at Irvine: *Mary Elizabeth (Lisa) Phipps.*

Elucidating the Nanostructure Evolution at the Molten Salt/Nickel Alloy Interface; Chaitanya Deo, Georgia Institute of Technology: *Remi Dingreville.*

Exciton Fine Structure in PbS Nanocrystals Embedded in Glass; Serguei Goupalov, Jackson State University: *Stephen Doorn.*

Exploring chemical vapor deposition for hybrid perovskite single crystal growth; Hisato Yamaguchi, Los Alamos National Laboratory: *Sergei Tretiak.*

Exploring the mechanisms and applications of Ge diffusion along an oxidizing Si/SiO2 interface; Kevin Jones, University of Florida: *John Nogan.*

Extension: Microfluidics for Fluorescence studies; Edward Lemke, EMBL: *George Bachand.*

Fabrication and Processing of Multilayer Superconducting Electronic Circuits; Nancy Missert, Sandia National Laboratories: *John Nogan.*

Fabrication of customized diamond field emitter array cathodes; Evgenya Simakov, Los Alamos National Laboratory: *Jinkyoung Yoo.*

Fluorescent Silver Clusters with High Spin Multiplicity for Biolabels; Dmitri Kilin, North Dakota State University: *Sergei Tretiak.*

Functional dielectric interface for electrostatic doping in layered perovskite quantum wells; Wanyi Nie, Los Alamos National Laboratory: *Aiping Chen.*

Functional Nanoparticles for Medicinal and Industrial Applications; Ian Henderson, Omphalos Bioscience LLC: *George Bachand.*

Fundamental understanding of irradiation produced defect clusters in Nb nanofoams; Chaitanya Deo, Georgia Institute of Technology: *Remi Dingreville.*

Ge/Si core/shell nanowire growth and device fabrication for quantum computing; Sergey Frolov, University of Pittsburgh: *Jinkyoung Yoo.*

Generation of novel hetero-interfaces via assembly of MOFs and MOCVD grown monolayer TMDCs; Kibum Kang, KAIST (Korea Advanced Institute of Science and Technology): *Jinkyoung Yoo.*

Heat Capacity Studies of Uranium Silicide Compounds; Hongwu Xu, Los Alamos National Laboratory: *Aiping Chen.*

Heterogeneous Bio-inspired Catalytic Cascades; Plamen Atanassov, University of California, Irvine: *Sergei Ivanov.*

High Temperature Heavy Ion Irradiation Induced Creep Measured Through in Situ TEM base Nanomechanics; Shen Dillon, University of Illinois at Urbana Champaign: *Khalid Hattar.*

High-density photonic chips with extreme skin-depth waveguides; Sangsik Kim, Texas Tech University: *Igal Brener.*

Impact of Ordered Doping on Self-Assembled Nanowire Registries; Elias Garratt, Michigan State University: *Edward Bielejec.*

Improved Battery Performance, Safety, and Cycle Lifetime through Engineering Stress at Electrode-Electrolyte Interfaces; Katharine Harrison, Sandia National Laboratories: *Katie Jungjohann.*

In situ measurements of hydrogen-induced dislocation behavior; Douglas Medlin, Sandia National Laboratories: *Katie Jungjohann.*

In situ studies on tensile and fatigue behavior of nanostructured gradient Ni and T91 steels; Xinghang Zhang, Purdue University: *Brad Boyce.*

InAs-based long wavelength interband cascade lasers; Rui Yang, University of Oklahoma: *John Klem.*

In-situ Diagnosis of Growth Kinetics and Structural Evolution in Entropy-Stabilized Oxide Epitaxial Thin Films; John Heron, University of Michigan: *Aiping Chen.*

In-situ Liquid Cell TEM Observations of Temperature Dependent Sn Lithiation; Zoey Warecki, University of Maryland College Park: *Katie Jungjohann.*

Integration of hollowed silicon nanoneedles onto a thin elastomer patch for conformal intracellular nanoinjection of biomolecules; Chi Hwan Lee, Purdue University: *Jinkyoung Yoo.*

Investigation into high external quantum efficiency, low parasitic absorption GaAs|AlGaAs double heterostructures with applications to laser cooling; Nathan Giannini, University of New Mexico: *John Reno*.

Investigation of Defect-Interface Interactions in 3D Interface Materials; Nate Mara, University of Minnesota: *Nan Li.*

Irradiation Effects on Helium Nanoplatelet Formation in Nanostructured Materials; Caitlin Taylor, Sandia National Laboratories: *Yongqiang Wang.*

Irradiation Effects on Microstructure and Mechanical Behavior of Metallic Nanowires; Yong Zhu, North Carolina State University: *Yongqiang Wang.*

Li+ Implantation into SiC Photonic Crystal for Quantum Science Research; D Kurt Gaskill, U.S. Naval Research Laboratory: *Edward Bielejec.*

Linking Biological Activity of Ocean Diatoms to Atmospheric Processing of Fe-containing Nanoparticles: Molecular Level Insights; Gayan Rubasinghege, New Mexico Institute of Mining and Technology: *Sergei Ivanov.*

Lipid Nanotube Networks to Characterize Transmembrane Receptors; Zachary Imam, Sandia National Laboratories: *George Bachand.*

Local Mechanical Properties of Au65Zn30Al5 at Elevated Temperatures; Taylor Jacobs, Los Alamos National Laboratory: *Nan Li.*

Manipulation of Magnetism in Layered Materials Using in-situ Light; Srinivasa Rao Singamaneni, The University of Texas at El Paso: *Rohit Prasankumar.*

Mapping crystallization kinetics of phase-change materials using in situ electron microscopy; Melissa Santala, Oregon State University: *Khalid Hattar.*

Measuring mRNA and Protein Content from Single-Cells with Single-Molecule Sensitivity; Dan Kalb, Los Alamos National Lab: *Jim Werner.*

Measuring the Effects of Ion-Irradiation in Metal-MAX Multilayered Nanocomposites: Hierarchical Microstructure for Tunable Strength and Toughness; Siddhartha (Sid) Pathak, University of Nevada, Reno: *Yongqiang Wang.*

Mechanics of Polymer-Infiltrated Nanoparticle Packings; Robert Riggleman, University of Pennsylvania: *Amalie Frischknecht.*

Microbridges for high density current density measurements; Boris Maiorov, Los Alamos National Laboratory: *Doug Pete.*

Microwave spectroscopy of Wigner solids using undoped semiconductor devices; Lloyd Engel, NHMFL: *Mike Lilly.*

Mid-infrared Photonic Integrated Circuit; Anthony Hoffman, University of Notre Dame: *John Klem.*

Modeling-based proof of concept of grass like nanowire arrays for fingerprint identification of contaminants; Jeffery Greathouse, Sandia National Laboratories: *Remi Dingreville.*

Modelling of hybrid perovskites for photovoltaics; Claudine Katan, CNRS Institut des sciences chimiques de Rennes: *Sergei Tretiak.*

Multi-Scale Characterization, Experiments and Modeling for Parametrically Homogenized Constitutive Models of Additively Manufactured Materials; Somnath Ghosh, Johns Hopkins University: *Brad Boyce.*

Multi-stage Integrated Nonlinear Optics in an AlN/Si3N4 Heterogeneous Multi-layered Material Platform; Aleem Siddiqui, Sandia National Laboratories: *Igal Brener.*

Nanomechanical Studies on Molecular Hydrates; Jennifer Swift, Georgetown University: *Nan Li.*

Nanorheology of Entangled Polymer Melts; Michael Rubinstein, Duke University: *Gary Grest.*

Nanoscale Dislocation Structures and Dynamic Grain Growth; Eric Taleff, University of Texas at Austin: *Brad Boyce.*

Nanoscale implantation of spin-qubits in wide-bandgap materials for quantum technology; Joseph Heremans, Argonne National Laboratory: *Edward Bielejec.*

Nanostructure Features and Phase Instability in Advanced Ceramics and Alloys; William Weber, University of Tennessee: *Yongqiang Wang.*

Nanostructured materials for efficient long-wavelength nonlinear photonics; David Burghoff, University of Notre Dame: *John Reno*.

Narrow-Gap Metamorphic Antimonide Based Topological Materials; Sanjay Krishna, The Ohio State University: *John Klem*.

New methods for nonadiabatic molecular dynamics in perovskite-based solar energy materials; Alexey Akimov, University at Buffalo: *Sergei Tretiak*.

Non-adiabatic electron-ion dynamics; Thomas Frauenheim, University of Bremen: *Sergei Tretiak*.

Nonlinear terahertz response of magnetoelectric excitations in multiferroic material Sr2FeSi2O7: Rolando Valdes Aguilar, Ohio State University: *Rohit Prasankumar*.

Novel Adatoms on Si: The Next Generation in Silicon Technology; Joseph Demuth, Independent (retired): *Ezra Bussmann.*

Novel Doping Mechanisms in Organic Semiconductors; Guillermo Bazan, University of California, Santa Barbara: *Sergei Tretiak*.

Novel Terahertz-Induced Quantum States Probed with Nonlinear Optics; Keith Nelson, Massachusetts Institute of Technology: *Rohit Prasankumar*.

Objective-first sorting and characterization of individual magnetic nanoparticles; Victor Acosta, University of New Mexico: *Dale Huber*.

Optical and electrical studies on copper-based chalcogenides cumsns4 (M = In or Ga) nanocrystals; Karthik Ramasamy, ubiqd: *Sergei Ivanov*.

Organometallic Nanoclusters for Improved Grid-Scale Energy Storage in Redox Flow Batteries; Benjamin Davis, Los Alamos National Laboratory: *Mary Elizabeth (Lisa) Phipps*.

Parity-time symmetric integrated zero-refractive-index waveguide; Zi Jing Wong, Texas A&M University: *Igal Brener.*

PECVD-Si meta-lens for high power laser applications; Alex Lovesee, Voss Scientific: *Willie Luk*.

Perovskite based photo-transistor for low light detector; Noelia Canicoba, University of Rennes, FOTON Laboratory: *Sergei Tretiak*.

Photoconductive Fano-metasurfaces for Terahertz Applications; Oleg Mitrofanov, University College London: *Igal Brener.*

Photodynamical Processes in Nanomaterials for Organic Photovoltaic Cells; Hans Lischka, Tianjin University: *Sergei Tretiak.*

Plasmonic Chemical Sensors; Jeremy Wright, Sandia National Laboratories: *Igal Brener*.

Polymer scaffolds for control of multi-nanoparticle assembly on multiple length scales; Stacy Copp, Los Alamos National Laboratory: *John Watt*.

Porous Nanowires for Thermoelectricity and Gas Sensing Applications; Luis F Fonseca, University of Puerto Rico: *Michael Pettes*.

Preparation and Characterization of Nano-wires with/without Grain Boundaries; Rong Zhong, Wenzhou University: *Brian Swartzentruber*.

Probing excitonic effects in two-dimensional materials with high spatial-temporal-spectral resolutions; Terefe Habteyes, University of New Mexico: *Hou-Tong Chen*.

Process-structure-properties relationships in passivated GaSb surfaces; Francesca Cavallo, University of New Mexico: *John Nogan*.

Production and characterization of ELP-based optical materials and characterization of ELP-dependent phenotypical changes in adult stem cells; Antonietta Lillo, Los Alamos National Laboratory: *Mary Elizabeth (Lisa) Phipps.*

PVD Synthesis and Nanomechanics of Metallic Nanocomposite Thin Films; Amit Misra, University of Michigan: *Nan Li.*

Quantum emission from defects in low dimensional nanomaterials; Xuedan Ma, Argonne National Laboratory: *Jinkyoung Yoo*.

Quantum Hall effect with superconducting contact; Javad Shabani, New York University College of Arts & Science: *Mike Lilly*.

Quantum Nanophotonics with FIB-implanted Color Centers in Diamond; Marko Loncar, Harvard University: *Edward Bielejec.*

Quantum nanophotonics with Silicon Vacancy Color-Centers in Diamond; Mikhail Lukin, Harvard University: *Edward Bielejec.*

Radiation effects challenge: a round robin; Laurent Capolungo, Los Alamos National Laboratory: *Remi Dingreville.*

Real time monitoring of ion-beam-induced defect cluster effects in Ni-based solid solution alloys; Cody Dennett, Massachusetts Institute of Technology: *Khalid Hattar.*

Role of dimensionality in f-based quantum materials; Priscila Rosa, Los Alamos National Laboratory: *Jinkyoung Yoo.*

Sample fabrication for LCLS and APS X-ray measurements; Nina Weisse-Bernstein, Los Alamos National Laboratory: *John Nogan*.

Self-/Directed Assembly and in-situ Understanding of Large Metallic and Semiconductor Nanoparticle Supercrystals; Ruipeng Li, Brookhaven National Laboratory: *Hongyou Fan*.

Self-assembly of perovskite quantum dots for efficient flexible solar cells; GUIFU ZOU, Soochow University, China: *Hongyou Fan.*

Single-atom active site catalyst based on transition metal phthalocyanines / graphene composite for methane to methanol conversion; Sanchari Chowdhury, New Mexico Institute of Mining and Technology: *Taisuke Ohta*.

Strengthening Mechanism at a Single Precipitate in a Metallic Nanocube; Wendy Gu, Stanford University: *Khalid Hattar.*

Structure and Properties of bcc Mg Synthesized Using Interface Strain Engineering; Siddhartha (Sid) Pathak, University of Nevada, Reno: *Nan Li.*

Studies of Citotoxicity and Bactericidal Effects of Colloidal Nanoparticles on Hybrid Oral Biofilms; Marek Osinski, University of New Mexico: *Dale Huber*.

Study of Mutual Interaction of Dielectric Metamaterials and Optical Microresonators in an Integrated Platform; Mani Hossein-Zadeh, University of New Mexico: *Igal Brener*.

Sulfur Embrittlement in Nanocrystalline Materials; Douglas Spearot, University of Florida: *Remi Dingreville*.

Superradiant interaction of hybrid modes in active silicon photonics; Mahdi Hosseini, Purdue University: *Edward Bielejec.*

Superradiant Optoelectronic Devices using Novel Metamaterials and Epsilon-Near-Zero Materials; Dongfang Li, Los Alamos National Laboratory: *Hou-Tong Chen*.

Tailoring the frequency response of linear polarization conversion using novel metamaterials with strongly coupled resonators; Cunlin Zhang, Capital Normal University: *Hou-Tong Chen*.

Terahertz Metamaterial Filters for Identification of Biomolecular Bonds; Joo-Hiuk Son, University of Seoul: *Hou-Tong Chen.*

The self-organization of magnetic dumbbell nanoparticles; Mikhail Feygenson, Forschungszentrum Jülich: *Sergei Ivanov.*

Thermodynamic Drivers and Kinetic Control for Stable and Optimized Self-Assembled π-Conjugated Microstructures; Chad Risko, University of Kentucky: *Sergei Tretiak*.

THz quantum cascade lasers as multi-beam local oscillators for space observatories; Jian-Rong Gao, SRON Netherlands Institute for Space Research: *John Reno*.

THz studies of mid-infrared materials; Juliet Gopinath, University of Colorado at Boulder: *Rohit Prasankumar*.

TMDs heterostructures; Chee Wei Wong, UCLA: *Rohit Prasankumar*.

Topological Photonics for Ultimate Photon Control; Ganapathi Subramania, Sandia National Laboratories: *John Nogan*.

Transcriptomic profiling of bacterial:fungal interactions by fluorescence microscopy; Demosthenes Morales, Los Alamos National Laboratory: *Jim Werner*.

Transient Absorption Spectroscopy of Oligo-Phenylene Ethynylene (OPE) Bound to Biological Assemblies; Eva Chi, University of New Mexico: *Rohit Prasankumar*.

Ultra-fast antenna-coupled light emitting diode; Ming Wu, University of California, Berkeley: *Han Htoon*.

Understanding Charge Transport in Metal-Nanocarbon Composites; Mehran Tehrani, University of New Mexico: *Tom Harris*.

Understanding the dispersion of $BaTiO_3$ in solution; Tyler Stevens, Sandia National Laboratories: George Bachand.

Understanding the Relationship Between Inter-Molecular Interactions and Energy Flow in Molecular Nanowires; Sahar Sharifzadeh, Boston University: *Sergei Tretiak*.

Understanding unusual mechanical properties of bulk nanograined Mg alloys; Jian Wang, University of Nebraska: *Nan Li.*

Using in situ TEM to Understand Nanocrystalline Granular Stability under Thermo-mechanical Loads; Greg Thompson, University of Alabama: *Khalid Hattar*.

Using Tungsten Nanoporous Structure to Manage Radiation Damage in Fusion Environments; Celine Hin, Virginia Tech: *Remi Dingreville*.