

**Brookhaven National Laboratory
FY 2005 LDRD PROJECTS**

| <u>LDRD Project</u> | <u>Project Title</u> | <u>P.I.</u> | <u>Dept/Bldg.</u> |
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| 03-004 | High-Brightness, High-Power Electron Beams | I. Ben-Zvi | CAD/817 |
| 03-056 | Structural Properties of Methane Hydrates | D. Mahajan | ES&T/815 |
| 03-064 | Investigation of Neutron and Gamma Probes to Detect Explosives in Sealed Containers | M. Todosow | ES&T/475B |
| 03-094 | Structural Studies on the Integral Membrane Protein AlkB | J. Shanklin | BIO/463 |
| 03-099 | The microPET Study of Gene Expression in Rodents | P. Thanos | MED/490 |
| 03-104 | Hydrogen Atom Transfer from Carbon to Metal - Relevance of a Novel Reaction to Catalyzed Hydrocarbon Conversions | M. Bullock | CHEM/555A |
| 03-105 | Radioprotection in D. Radiodurans, a Radiation Resistant Bacterium | D. Cabelli | CHEM/555A |
| 03-107 | New Development of Norepinephrine Transporter Radioligands for PET Studies of Substance Abuse, Depression and ADHD | Y.-S. Ding | CHEM/555A |
| 03-118 | Condition: Green Chemistry Radiolytic Studies of Ionic Liquids in Service of Security and the Environment | J. Wishart | CHEM/555A |
| 03-119 | Exploring the Use of Powder Diffraction for Proteins | M. Allaire | NSLS/725D |
| 03-121 | Element-Resolved Dynamics of Nanoscale Ferromagnets | C.-C. Kao | NSLS/725D |
| 03-122 | Membrane Biophysics Using Model Membranes | R. Pindak | NSLS/725D |
| 03-127 | High Pressure in Strongly Correlated Materials - An Optical Investigation | C. Homes | CMP/510B |
| 03-129 | Polyoxometalate Giant Molecules: Novel Synthetic Methods, Characterizations and Potential Applications | Tianbo Liu | CMP/510B |
| 03-138 | Functional Bulk Mn-Based Nanocomposites | L. Lewis | MSD/480 |
| 03-151 | Radio Wave Detection of Ultra High Energy Cosmic Rays | H. Takai | PHYS/510A |
| 03-162 | New Synthesis Techniques to Control Atomic Defects in Advanced Intermetallic Compounds | L. Cooley | MSD/480 |
| 04-011 | Femtosecond Photoinitiated Nanoparticle Surface Chemistry | N. Camillone | CHEM/555 |
| 04-013 | Chirped Pulse Amplification at the DUV-FEL | L.H. Yu | NSLS/725C |
| 04-025 | Overcoming Coherent Instabilities at Medium-Energy Storage Rings | J.-M. Wang | NSLS/725C |
| 04-033 | Layered Cobaltates with High Thermoelectric Power | Qiang Li | MSD/480 |
| 04-038 | Complex Thin Films and Nanomaterial Properties | J. Misewich | MSD/480 |
| 04-041 | Physics of Quark Gluon Plasma (QGP) | P. Petreczky | PHYS/510A |
| 04-043 | Very Long Baseline Neutrino Oscillation Experiment | M. Diwan | PHYS/510E |
| 04-046 | Advanced ³ He Detectors for the Spallation Neutron Source | G. Smith | INST/535B |
| 04-055 | Genetic NanoTags | J. Hainfeld | BIO/463 |
| 04-060 | The Use of Singular Point Genome Sequence Tags to Analyze Community Composition and Metabolic Potential | D. van der Lelie | BIO/463 |
| 04-061 | 3-D Electronic Wave Functions from EM Images | J. Wall | CFN/463 |

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| 04-062 | Functional MRI Studies in Rats using Implanted Brain Electrodes | A. Gifford | MED/490 |
| 04-063 | Optimizing Functional Neuroimaging Techniques to Study Brain Function in Health and Disease States | R. Goldstein | MED/490 |
| 04-066 | Technological Development of a Fluorescence Probe for Optical Detection of Brain Functional Activation <i>in vivo</i> | C. Du | MED/490 |
| 04-069 | Nuclear Control Room Unfiltered Air In-Leakage by Atmospheric Tracer Depletion (ATD) | R. Dietz | ESD/815E |
| 04-073 | Perfluorocarbon Tracer Sampling, Tagging and Monitoring Techniques for use at the Urban Atmospheric Observatory | J. Heiser | ESD/830 |
| 04-079 | Development of an Aerosol Mobility Size Spectrometer and an Aerosol Hygroscopicity Spectrometer | J. Wang | ESD/815E |
| 04-086 | Exploration of Thermal Diffusion Processes in CdZnTe for Improved Nuclear Radiation Detectors | A. Bolotnikov | NNS/197C |
| 04-088 | An Integrated Approach of High Power Target concept Validation for Accelerator-Driven Systems | N. Simos | EST/475B |
| 04-104 | Hydrogen Storage Using Complex Metal Hydrides for Fuel Cell Vehicles | J. Wegrzyn | EST/815 |
| 05-003 | Full Power Test of the Amplifier for the Optical Stochastic Cooling using JLAB FEL | V. Yakimenko | PHYS/820M |
| 05-005 | Study of Photon Coupling to an Electromagnetic Field Gradient | C. Scarlett | PHYS/510E |
| 05-006 | Heavy Ion Physics with the ATLAS Detector | H. Takai | PHYS/510A |
| 05-017 | Superconducting Lead Photoinjector | J. Smedley | INST/535B |
| 05-020 | Controlled Formation of Nanostructured RuO ₂ Catalysts | P. Sutter | CFN/555 |
| 05-021 | Hydrogen Storage in Complex Metal Hydrides | T. Vogt | CFN/510A |
| 05-028 | Behavior of Water on Chemically Modified Semiconductor Surfaces: Toward Photochemical Hydrogen Production | E. Fujita | CHEM/555A |
| 05-030 | Assembling of Biological and Hybrid Complexes on Surfaces | O. Gang & P. Freimuth | CFN/510B |
| 05-033 | Ultra High Resolution Photoelectron Spectrometer | P. Johnson | CMP/510B |
| 05-038 | Metal-Metal Oxide Electrocatalysts for Oxygen Reduction | M. Vukmirovic | MSD/555 |
| 05-041 | Multifunctional Nanomaterials for Biology | S. Wong | MSD/480 |
| 05-042 | Polariton-Enhanced FRET for Device-Integration of Plasma Membranes from Rhodospirillum rubrum | P. Abbamonte | NSLS/725D |
| 05-044 | Intense THz Source & Application to Magnetization Dynamics | G. L. Carr | NSLS/725D |
| 05-048 | Nano-Imaging of Whole Cells with Hard X-Ray Microscopy | L. Miller | NSLS/725D |
| 05-050 | Study to Convert NSLS VUV Ring to Coherent IR Source | B. Podobedov | NSLS/725C |
| 05-051 | Superconducting Undulator Technology | G. Rakowsky | NSLS/725D |
| 05-057 | Characterization and Imaging of Amyloid Plaques Using Diffraction Enhanced Imaging | Z. Zhong | NSLS/725D |
| 05-058 | Development of Methodologies for Analyzing Transcription Factor Binding in Whole Genomes | C. Anderson | BIO/463 |
| 05-063 | Application of Endophytic Bacteria to Improve the Phytoremediation of TCE and BTEX using Hybrid Poplar | D. van der Lelie | BIO/463 |

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| 05-064 | Design and Build Two Dimensional Proten-Lipid Thin Film: A First Step Toward Novel Biochips | Y. Wei | BIO/463 |
| 05-068 | Positron Labeled Stem Cells for Non-Invasive PET Imaging Studies of In-Vivo Trafficking and Biodistribution | S. Srivastava | MED/801 |
| 05-069 | Breaking the Millimeter Resolution Barrier in fMRI | D. Tomasi | MED/490 |
| 05-070 | Novel Multi-Modality MRI and Transcranial Magnetic Stimulation to Study Brain Connectivity | E. de Castro Caparelli | MED/490 |
| 05-071 | Ovarian Hormone Modulation of ICP: MRI Studies | A. Biegon | MED/490 |
| 05-072 | Feasibility of CZT for Next-Generation PET Performance | P. Vaska | MED/490 |
| 05-074 | Biology on Massively Parallel Computers | J.W. Davenport | CDIC/463B |
| 05-078 | Ionic Liquids in Biocatalysis and Environmental Persistence | A.J. Francis | ESD/490 |
| 05-082 | Single Particle Laser Ablation Time-of-Flight Mass Spectrometer (SPLAT-MS) Enhancements: Aerosol Optical Properties and Increased Particle Detectivity | G. Senum | ESD/815E |
| 05-088 | Transition Metals in Oil and Gas Exploration | A. Vairavamurthy | ES&T/815 |
| 05-092 | An Innovative Infiltrated Kernel Nuclear Fuel (IKNF) for High-Efficiency Hydrogen Production with Nuclear Power Plants | J. Saccheri & B. Bowerman | ES&T/475B |
| 05-094 | Development of Green Processes: Catalytic Hydrogenation in Water Utilizing In Situ Biologically-Produced Hydrogen | D. Mahajan | ES&T/815 |
| 05-098 | Fast Neutron Imaging Detector | J. Lemley | NNS/197C |
| 05-104 | Giant Proximity Effect in High-Temperature Superconductors | I. Bozovic | MSD/480 |
| 05-105 | Local/Regional Aerosol Chemical Transport Model | S. Schwartz | ESD/815E |
| 05-106 | Exploring Root Physiology in Relation to Uptake of Groundwater Pollutants | R. Ferrieri/M. Thorpe | CHEM/555 |
| 05-107 | Senior Plant Scientist | C. Anderson | BIO/463 |
| 05-108 | Environmental Molecular Science | J. Fitts | ESD/830 |
| 05-109 | Atmospheric Science | A. Vogelmann | ESD/490D |
| 05-110 | Computational Science | D. Keyes | DA |
| 05-111 | CryoEM Research Capabilities at BNL for Biology Applications | H. Li | BIO/463 |
| 05-113 | High-Field MRI | W. Rooney | CHEM/555A |
| 05-114 | Study of High-Tc Nanostructures | I. Bozovic | MSD/480 |