

**Brookhaven National Laboratory
FY 2006 LDRD PROJECTS**

<u>LDRD Project</u>	<u>Project Title</u>	<u>P.I.</u>	<u>Dept/Bldg.</u>
03-104	Hydrogen Atom Transfer from Carbon to Metal - Relevance of a Novel Reaction to Catalyzed Hydrocarbon Conversions	M. Bullock	CHEM/555A
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	Lattice QCD relevant for RHIC and AGS	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
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/197D
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/463
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 Rhodobacter Sphaeroides	C.-C. Kao	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
05-064	Design and Build Two Dimensional Protein-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/490A
05-082	Single Particle Laser Ablation Time-of-Flight Mass Spectrometer (SPLAT-MS)	G. Senum	ESD/815E

	Enhancements: Aerosol Optical Properties and Increased Particle Detectivity		
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/197B
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	Development of an Observation-based Photochemical-Aerosol Modeling System	D. Wright	ESD/815E
05-110	Computational Science	J.W. Davenport	CSC/463B
05-114	Study of High-Tc Nanostructures	I. Bozovic	MSD/480
06-001	Lattice Studies of QCD Thermodynamics on the QCDOC	F. Karsch	PHYS/510A
06-004	Detector Development for Very Long Baseline Neutrino Exp.	M. Diwan	PHYS/510E
06-012	Detector for High Quality Images of Electron Microscopy	P. Rehak	INST/535B
06-017	Transmission Photocathode Development	J. Smedley	INST/535B
06-021	Synthesis and Characterization of Band-Gap-Narrowed TiO ₂ Thin Films and Nanoparticles for Solar Energy Conversion	E. Sutter	CFN/480
06-025	Solar Production of H ₂ by Nickel Hydrogenase Model Compounds via Proton-Coupled Electron-Transfer Reactions	R.M. Bullock	CHEM/555A
06-026	Multiscale Analysis of In Vivo Nanoparticle Exposure	W.K. Schiffer	CHEM/555
06-030	Development of Gadolinium-Loaded Liquid-Scintillators with Long-Term Chemical Stability for a New High-Precision Measurement of the Neutrino Mixing Angle, Theta-13	R.L. Hahn	CHEM/555A
06-037	Electronic Properties of Carbon Nanotubes and Novel Multicomponent Nanomaterials	J.P. Hill	CMP/510B
06-038	Growth and Characterization of CdZnTe Crystals for Improved Nuclear Radiation Detectors	G. Gu/A. Bolotnikov	CMP/MSD/NNS/510A
06-039	Design, Synthesis and Characterization of a New Class of Hydrocarbon Polymers Containing Zwitter Ions and Nanostructured Composites for High Temperature Membrane in PEM Fuel Cells	X.Q. Yang	MSD/555
06-044	New High-Resolution X-Ray Monochromators for Condensed-Matter Science Experiments	W.A. Caliebe	NSLS/725D
06-046	Novel Materials for Hard X-Ray Optics	K. Evans-Lutterodt	NSLS/725D
06-047	Nano-Crystallography of Individual Nanotubes and Nanoparticles	C. Nelson	NSLS/725D
06-052	High-Temperature Superconducting Magnet Development	T. Tanabe	NSLS/725D
06-056	Epigenetics: Mathamphetamine (MAP)-Induced Brain Dysfunction and Methylation of DNA	J. Dunn	BIO/463
06-060	Molecular Mechanism of Chromosomal Replication Initiation in Eukaryotic System	H. Li	BIO/463
06-061	Diversification of Isoflavonoid Biosynthesis	C.-J. Liu	BIO/463
06-065	Metabolic Flux Analysis in Arabidopsis Thaliana	J. Schwender	BIO/463
06-066	Transformation and Fate of Nanomaterials in the Environment	J. Fitts	ESD/830

06-071	Development of a Cloud Condensation Nucleus Separator	J. Wang	ESD/815E
06-074	Aluminum Hydride - An Ideal Hydrogen Source for Small Fuel Cells	J. Graetz	ES&T/815
06-087	Gamma Ray Imager for National Security Applications	P.E. Vanier	NNS/197C
06-088	Neurogenomics: Collaboration Between the Biology Department and the Brookhaven Center for Translational Neuroimaging to Investigate Complex Disease States	N. Alia-Klein/J.S. Fowler	MED/490
06-092	Nanoparticle Labeled Neural Stem Cell Tracking In Vivo by Magnetic Resonance Microscopy	H. Benveniste	MED/490
06-094	MicroCT Methods of Quantitative Adipose Imaging: Development of a Long-Term Assessment Technique for Studying Obesity in a Rodent Model	G.J. Wang	MED/490
06-095	Study of Overdoped HTS Materials	I. Bozovic	MSD/480
06-096	HTS Trilayer Josephson Junctions	I. Bozovic	MSD/480