Laboratory Directed Research and Development Program FY 2010

Lead-PI	Title	Allocation ($K)
Agarwal	Enabling HPC Workflows on Clouds	182
*Anders	Plasma-Assisted High Rate Deposition Concept for Energy Applications	200
Arenholz, Prestemon	Optimization of Flux Pinning in Type II Superconductor Based Magnets for Soft X-ray Scattering Applications	202
Auer, Liphardt	Integrated Tools in Multiscale Imaging	290
Balsara et al	Synthesis and Characterization of Self-Assembled Battery Electrodes	135
Battaglia, Denes	Advanced Silicon Detectors for Future Short Pulse X-ray Sources	159
Bazjanac et al	Embedded Engineering, Construction Materials, and HVAC Components in Modular Energy Systems Simulation	150
Bell, Pau	Low Order Models for Simulation of Ballistic Transport in Nanoscale Devices	171
Biggin et al	Measurement of Protein/ DNA Binding in vitro and in vivo Using Single Molecule Approaches	222
Blakely	Synchrotron-Based Microtomography for Functional Analysis of Normal Tissue and Tumor Molecular Markers, and Their Perturbation by Low-Dose Radiation Exposure	88
Brodie	Uncovering the Mechanistic Basis for Soil Microbial Community Response to Altered Precipitation Patterns.	108
Budker, Mueller	Direct Comb Spectroscopy of Lithium in the Vacuum Ultraviolet and Beyond	152
Carter et al	Enhancing the Effectiveness of Manycore Chip Technologies for High-End Computing	211
Chang	Biological Methods for Synthesis of Iron-Based Nanomaterials	122
Clarke, Haeffner	Heating Rates of Planar Ion Traps for Quantum Information	165
*Commer et al	Enhanced Subsurface Fluid Characterization Using Joint Hydrological and Geophysical Imaging	209
Comolli et al	Linking Genomics, Proteomics and Ultrastructural Characterization of Microbial Communities and Their Viruses	171
Coughlin, Fridley	Physically-Based Accounting for Resource Use in New Energy Pathways	108
Fletcher, Arkin	Engineering Environmental Sensitivity in an Artificial Cell	119
Freedman et al	Bolometric Detectors for the Neutrinoless Double-Beta Decay Experiments	160
Garcia Martin et al	Metafluxomics of a Phosphorus Removing Microbial Community	120
Gessner	Probing Transient Molecular Entanglement Using Femtosecond High Resolution Delayed-field Coincidence Imaging	158
Gilchriese, Haber	Development of Multi-Modular Assemblies with Reduced Material and Services for Tracking at Future Colliders	143
Gilles	Development of In Situ Cells for Reactive Spectroscopic and Microscopic Studies	147
Gomez-Sjoberg et al	Parallel Microfluidic Synthesizer: A Fully Automated Chemical Evolution Platform for Novel Materials Discovery	143
Gregorich, Nitsche	Heavy Element Mass Analysis and Detector Capabilities	149
Groves	Applications of Hybrid Live Cell Synthetic Devices for Cancer Research	140
Harris	Dynamics of Homogeneous Catalysis Reactions Investigated with Transient Two-Dimensional Infrared Spectroscopy	129
Hexemer et al	Soft X-ray Scattering as a New Probe of Polymer Systems	277
Hexemer et al	Long-Range Ordering of Block Copolymers on Patterned Silicon	170
Jansson,C.	Carbon Uptake and Partitioning in Plants and Algae	301
Jansson,J. et al	Microbiomics of Complex Microbial Communities in Environmental Samples	302

Smoot, Leauthaud	Decoding Dark Energy with Weak Gravitational Lensing	171
Snijders	Syngeneic Mouse Model for Breast Cancer Metastasis and Organ Tropism	180
Strohmaier	Reference Benchmarks for the Dwarfs (Algorithms)	211
Tainer et al	Bio Energy Technologies and Science Integrated Efficiently (BETSIE)	187
Tirrell	Structured Charged Polymers	206
Torn et al	Biological Carbon Sequestration: Fundamental Research on Biological Carbon Capture and Soil Carbon Stabilization	340
Toth et al	Experimental Demonstration of a Laser-Plasma-Accelerator Driven Free-Electron Laser	378
Tyliszczak et al	Ambient Pressure Photoemission Spectroscopy	158
Urban et al	Understanding How Nanoscale Interfaces Modify Predicted Optical, Vibrational, and Electronic Properties	137
Vay et al	Lorentz Compaction of Scales for Ultra-Efficient Simulation of Advanced Accelerators (and Other Systems)	169
Venturini et al	Linac Driver and Coherent Soft X-ray Sources	448
Vetter, Zimmermann	Ultra-Sensitive Ge Detectors for Low-Background Physics Experiments	178
*Wang,D.	Multinozzle Arrays for Single Cell Metabolomics	192
Wang,F.	Integrated Photonic, Electronic and Spintronic Devices Based on Graphene	142
Warwick et al	Test Monochromator/ Spectrometer Systems with Prototype High Density Gratings for High Resolution X-ray Scattering	181
Weber	Double-Auger Emission of Small Molecules Following Core-Excitation and Ionization	130
Wetter et al	Building Systems for Net Zero Energy Buildings	174
White, M., Padmanabhan	Calibrating Baryon Acoustic Oscillations for Future Dark Energy Experiments	126
Wiese	Functional Characterization of NUCKS- a Potential Cancer Susceptibility Locus Required for Recombination	185
Wu,J., Madduri	Managing Petascale Data with Emerging Computer Architectures	181
Yang, P. et al	Design and Surface Properties of Semiconductor Nanowires	261
Yang,C., Marchesini	Computational Techniques for Non-crystalline X-ray Diffraction Imaging	148
Yashchuk, Goldberg	X-Ray Optical Metrology for Coherence-Preserving Adaptive Optics	178
Yildiz	Control of IntraflagellarTransport in Chlamydomonas Cells	199
Yuan,F., Xiao	Theoretical Study of Nucleon Structure	137
*Zhang, Y.	Surface-Selective Synthesis of Graphene Nanoribbons on Nanowire Templates	203
Zwart, Hexemer	Development of Reusable Software Modules for the Analyses of BioSAXS Data	143
	Total	18,784

*Track 2 Discovery Review projects