

Handout from  
Dr. Barnhill at 5/12/05  
BGR  
meeting

**DRAFT Research Alignment – Los Alamos Divisions and U.T. System DRAFT**  
(Information initially compiled January, 2003; currently being updated)

LANL Divisions - Science and Technology Capabilities *	UT System Research Centers, Institutes, and Laboratories **
<p><b>Strategic Research Directorate</b></p> <ul style="list-style-type: none"> <li> <p><b>Chemistry Division</b> “Areas of responsibility include isotope and nuclear chemistry, biochemistry, health and environmental chemistry and special-function lasers. Current activities in the division cover a wide range of topics including actinide and fission product chemistry, inorganic and organometallic chemistry, catalysis, radioisotope production and distribution, chemical engineering, detection technologies, nanoscience and nanotechnology, analytical chemistry, environmental chemistry, nuclear and radiochemistry, physical chemistry, chemical and nuclear physics, and optical and vibrational spectroscopy.”</p> </li> <li> <p><b>Earth and Environmental Sciences Division</b> “Areas of responsibility include multidisciplinary basic and applied research in atmospheric, environmental, and solid earth phenomena important to national security, environmental quality, and energy security. This Division includes the Institute of Geophysics and Planetary Physics, which supports basic research in astrophysics, geophysics; and oceanic, atmospheric, and magnetospheric sciences.”</p> </li> <li> <p><b>Material Science and Technology Division</b> “This division provides the core materials science and technology base for maintaining confidence in the safety and reliability of the nation’s nuclear weapons. The MST Division comprises two centers and five groups that bring complementary strengths to the division’s areas of expertise: ceramic science and technology, materials research and process science, metallurgy, polymers and coatings, condensed matter and thermal physics, and electronic materials and device research.”</p> </li> <li> <p><b>Theoretical Division</b> “Covers many disciplines of theoretical science, including applied mathematics, chemistry, biology, engineering, and much of theoretical physics ranging from fundamental issues to the modeling of complex systems. This division’s work is a combination of basic research and applications, with each aiding the other in making progress. Theoretical results contribute to computer modeling, and the tests and applications that result from modeling help define new directions in basic research.”</p> </li> </ul>	<ul style="list-style-type: none"> <li>Texas Materials Institute (UT Austin)</li> <li>Center for Materials Chemistry (UT Austin)</li> <li>Center for Nano and Molecular Science and Technology (UT Austin)</li> <li>Center of Nanostructure and Materials (UTA)</li> <li>Center for Advanced Polymer Research (UTA)</li> <li>Center for Colloidal Interfacial Dynamics (UTA)</li> <li>Materials Research and Technology Institute (UTEP)</li> <li>Mass Spectroscopy Lab (UTSA)</li> <li>Center for Environmental Health and Medicine (UTMB)</li> <li>Center for Biomedical Engineering (UTMB)</li> <li>Combinatorial Chemistry Core (UTMB)</li> <li>Optical Imaging Lab (MDAnderson)</li> <li>Digital Imaging Research Lab (MDAnderson)</li> <li>Imaging Guided Therapy Lab (MDAnderson)</li> </ul> <ul style="list-style-type: none"> <li>Environmental Science Institute (UT Austin)</li> <li>Institute for Geophysics (UT Austin)</li> <li>Bureau of Economic Geology (UT Austin)</li> <li>McDonald Observatory (UT Austin)</li> <li>Geotechnical Engineering Center (UT Austin)</li> <li>Center for Biological Macrofouling (UTA)</li> <li>SwRI Space Sciences Partnership (UTSA)</li> <li>Institute for Research in Water and Natural Resources (UTSA)</li> </ul> <ul style="list-style-type: none"> <li>Center for Mechanics of Solids, Structures, and Materials (UT Austin)</li> <li>Nuclear Engineering Teaching Laboratory (UT Austin)</li> <li>Ferguson Structural Engineering Lab (UT Austin)</li> <li>Texas Materials Institute (UT Austin)</li> <li>Center for Nano and Molecular Science and Technology (UT Austin)</li> <li>Center for Materials Chemistry (UT Austin)</li> <li>Center for Advanced Polymer Research (UTA)</li> <li>Center for Condensed Matter Physics (UTA)</li> <li>Center for Nanostructured Material (UTA)</li> <li>Nanofabrication Research and Teaching Center (UTA)</li> <li>Positron Surface Laboratory (UTA)</li> <li>Center for Electron Microscopy (UTA)</li> <li>Center for Micro-Scale Heat Transfer (UTA)</li> <li>Center for Electro-Optics (UTA)</li> <li>Materials Research and Technology Institute (UTEP)</li> <li>Digital Imaging Research Lab (MDAnderson)</li> </ul> <ul style="list-style-type: none"> <li>Texas Institute for Computational and Applied Mathematics (UT Austin)</li> <li>Center for Nonlinear Dynamics (UT Austin)</li> <li>Institute for Theoretical Chemistry (UT Austin)</li> <li>Institute for Fusion Studies (UT Austin)</li> <li>Ilya Prigogine Center for Studies in Statistical Mechanics and Complex Systems (UT Austin)</li> </ul>

\*Division activities taken from the LANL website (<http://www.lanl.gov>)  
 \*\*Partial list of UT System research centers, institutes and laboratories (organized research units)

	<ul style="list-style-type: none"> <li>• High Performance Computing Facility (UTA)</li> <li>• High Energy Physics Laboratory (UTA)</li> <li>• Center for Theoretical Condensed Matter Physics (UTA)</li> </ul>
<p><b><u>Threat Reduction Directorate</u></b></p> <ul style="list-style-type: none"> <li>• <b><i>BioScience Division</i></b>          “The BioScience division fosters research at the interface of biology, chemistry, physics, and computational biology to create and discover frontier science and technology that benefit national security, public health, and the environment. The Division provides a multidisciplinary mix of capabilities focused on the strategic thrust areas of bio-threat reduction, functional genomics, structural genomics, complex biosystem modeling, natural and engineered biochemical diversity, and biomedical technology. The Center for Human Genome Studies also resides in BioSciences Division.”</li> <li>• <b><i>Decision Applications Division</i></b>          “This Division is responsible for supporting national security and energy programs through systems engineering, decision analysis simulation, and multidisciplinary analysis. The division also has responsibility for nuclear plant safety analysis and nuclear criticality safety. Areas of expertise in the division include the following: Statistics; Systems engineering and integration; Energy and environmental analysis; Military systems analysis and simulations; Systems performance and analysis; Technical modeling and analysis; Simulation applications; Engineering and safety analysis; Advanced reactor safety; Reactor design and analysis; Nuclear criticality and Politico-military analysis.”</li> <li>• <b><i>Nonproliferation and International Security Division</i></b>          “The proliferation of weapons of mass destruction and the means to deliver them remains a major national security issue despite the end of the Cold War. Los Alamos National Laboratory’s Nonproliferation and International Security Division (NIS) was established in the fall of 1993 to respond to the continuing proliferation threat. The NIS mission is to develop and apply preeminent science and technology to deter, detect, and respond to proliferation and to ensure U.S. and global security. This mission challenges NIS scientists and engineers to seek innovative solutions to highly complex technical problems.”</li> </ul>	<ul style="list-style-type: none"> <li>• Institute for Cell and Molecular Biology (UT Austin)</li> <li>• Center for Computational Biology (UT Austin)</li> <li>• Center for Strategic and Innovative Technologies (UT Austin)</li> <li>• Center for Biological and Medical Engineering (UT Austin)</li> <li>• Bioscience and Bioengineering Center (UTA)</li> <li>• Center for Biodefense, Western Regional Center of Excellence for Biodefense and Emerging Infectious Diseases, and the Galveston National Laboratory (UTA)</li> <li>• Border Biomedical Research Center (UTEP)</li> <li>• Cajal Neuroscience Institute (UTSA)</li> <li>• Institute for Cellular and Molecular Primatology (UTSA)</li> <li>• Center of Excellence in Biotechnology and Bioprocessing Education and Research (UTSA)</li> <li>• Center for Structural Biology (UTMB)</li> <li>• Genomics Core (UTMB)</li> <li>• Proteomics Core (UTMB)</li> <li>• Bioinformatics Program (UTMB)</li> <li>• Combinatorial Chemistry Core (UTMB)</li> <li>• Center for Biomedical Engineering (UTMB)</li> </ul> <p><i>NOTE: Several other UT System Health Institutions have extensive research programs in this area</i></p> <ul style="list-style-type: none"> <li>• Texas Institute for Computational and Applied Mathematics (UT Austin)</li> <li>• Nuclear Engineering Teaching Laboratory (UT Austin)</li> <li>• Center for Infrastructure Assurance and Security (UTSA)</li> <li>• Center for Response and Security Engineering and Technology (UTSA)</li> <li>• Center for Artificial Intelligence (UTA)</li> <li>• Information Technology Laboratory (UTA)</li> <li>• Pervasive Information Communities Organization (UTA)</li> </ul> <ul style="list-style-type: none"> <li>• Center for Digital Image Processing (UTA)</li> <li>• Institute for research in Security (UTA)</li> </ul>
<p><b><u>Weapons Engineering and Manufacturing Directorate</u></b></p> <ul style="list-style-type: none"> <li>• <b><i>Engineering Sciences and Applications Division</i></b>          Information not available</li> </ul>	

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- **Nuclear Materials Technology Division**

“Areas of responsibility for the Nuclear Materials Technology Division include weapon component technology; pit manufacturing and certification; pit surveillance; nuclear materials certified enhanced surveillance, management safeguards and security; actinide and process chemistry research and development; nuclear fuels and power source technologies; waste management, regulatory, and environmental compliance; and pit and nuclear material disposition.”

**Weapons Physics Directorate**

- **Applied Physics Division**

“Applied Physics is the premier national resource for information, expertise, and solutions involving all aspects of nuclear weapons physics and related national security issues. This division has a lead role in assessing the safety and reliability of the enduring nuclear stockpile. This division also contributes to the analysis of emerging proliferation threats and develop response options. The Division’s core technical activities lie in the areas of computational modeling and simulation, and physics model development, of complex problems requiring the coupling of multiple physical processes.”

- **Computer and Communications Networking Division**

“This division focuses on developing and operating the most powerful scientific computing facility in the world including all aspects of high-performance computing, storage, networking, visualization, software engineering, and computing environments.”

- **Computer and Computational Sciences Division**

“This newly-formed division will focus on research issues in computer and computational science associated with employing the largest, most complex computational resources ever assembled. CCS division provides a broad scientific and technological foundation to address important national issues such as stockpile stewardship, energy and environment, bioscience, and crisis management. The Division includes a multidisciplinary mix of capabilities focused on the following strategic thrust areas: Advanced computing; Methods for advanced scientific simulation; Modeling, algorithms, and informatics and Transport methods.”

- **Dynamic Experimentation Division**

Information not available

- **Los Alamos Neutron Science Center**

“(LANSCE) produces intense sources of pulsed spallation neutrons, which provide the United States scientific community with the capability to perform experiments that support national security and civilian research. LANSCE comprises a high-power 800 million electron volt proton linear accelerator (linac), a Proton Storage Ring, production targets to the Manuel Lujan Jr. Neutron Scattering Center and the Weapons Neutron Research facility, and a variety of associated experiment areas and spectrometers. With the ability to produce neutrons with energies that range over 14 orders of magnitude using the world’s most powerful proton linac, LANSCE is ideal for research in neutron scattering, neutron physics, and transmutation technologies.”

- Applied Research Laboratories (UT Austin)
- Texas Institute for Computational and Applied Mathematics (UT Austin)
- High Performance Grid Computing Facility (UTA)
- Center for Theoretical Condensed Matter Physics (UTA)
- High Energy Physics Laboratory (UTA)

- Texas Advanced Computing Center (UT Austin)
- Texas Institute for Computational and Applied Mathematics (UT Austin)
- High Performance Grid Computing Facility (UTA)
- High Energy Physics Laboratory (UTA)

- Texas Institute for Computational and Applied Mathematics (UT Austin)
- Texas Advanced Computing Center (UT Austin)
- High Performance Grid Computing Facility (UTA)

- Nuclear Engineering Teaching Laboratory (UT Austin)
- High Energy Physics Laboratory (UTA)

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- ***Physics Division***

“This division provides the fundamental physics understanding to support Laboratory programs. Division personnel investigate the basic properties of nuclear interactions, high-energy-density systems, and biological systems with a view toward identifying technologies applicable to new Laboratory directions.”

- High Energy Physics Laboratory (UTA)
- Positron Surface Laboratory (UTA)
- Center for Theoretical Condensed Matter Physics (UTA)
- Digital Imaging Research Lab (MDAnderson)

**NOTE:** Several Physics Departments at component institutions, notably UT Austin, have research programs in these areas