

UNCLASSIFIED



Science and Engineering Opportunities

*Increasing our technical competitiveness through
University Collaborations*

Nan Sauer

<http://institute.lanl.gov>

LA-UR-08-2245

What are NSEC and the LANL Institutes?

Research and education partnerships with NM and UC Universities in key capability areas to:

- ***Recruit the best scientists and engineers*** to support our national security mission and programs
 - Train and attract the very best scientists and engineers
 - Impact graduate education in our mission relevant areas
- ***Retain and revitalize our current staff through:***
 - Training and educational opportunities with the campuses
 - Cutting edge research collaborations
 - Enhanced technical competitiveness and funding opportunities
 - Access to unique facilities and new technologies

NSEC is comprised of five educational Institutes

- **Engineering Institute**
 - UC San Diego
 - Damage prognosis, Sensing and Networks
- **Institute for Multi-Scale Materials Studies**
 - UC Santa Barbara
 - Soft Materials, polymers, nanotechnology
- **Information Science & Technology Institute**
 - UC Santa Cruz/Carnegie Mellon
 - Data Management, high performance computing
- **Materials Design Institute**
 - UC Davis
 - Materials, medical radioisotopes, energy and pathogens
- **Institute for Advanced Studies**
 - NM consortium of research universities (UNM, Tech, State)
 - Focus areas aligned with mutual interest areas
 - HPC, Cosmology and Astrophysics, Energy and Environment



Educational Institutes' focus: recruit, retain, and revitalize

Education

- Graduate courses in HPC, Engineering, and Materials Science
- Undergraduate summer schools
- Tutorials

Research collaborations with campuses

- multiple projects with staff and faculty

Technical exchanges

- Workshops and Conferences
- Lectures and seminar series

Information Science & Technology



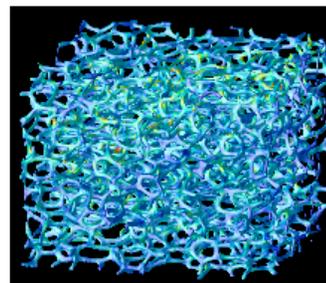
Advanced Studies



Materials Design



Multiscale Material Studies



Engineering

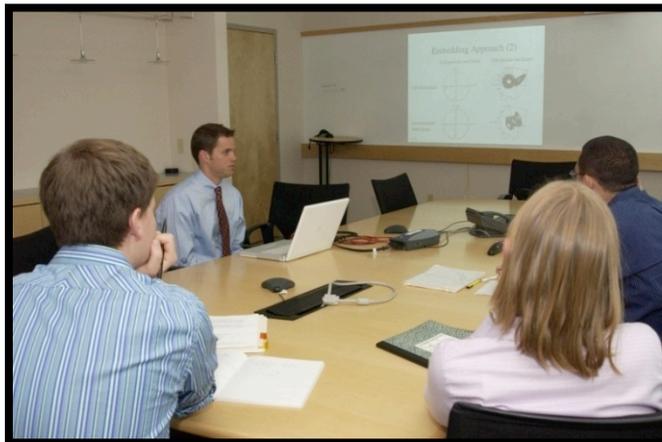


Graduate courses for staff retention & revitalization

Classes are offered jointly with the Universities

Institutes has offered 45 graduate classes

- engineering, high performance computing and materials from UC and NM Schools.
- Attendees come from across the Lab
- 7 staff currently enrolled in the Engineering Institute/UCSD graduate degree program.

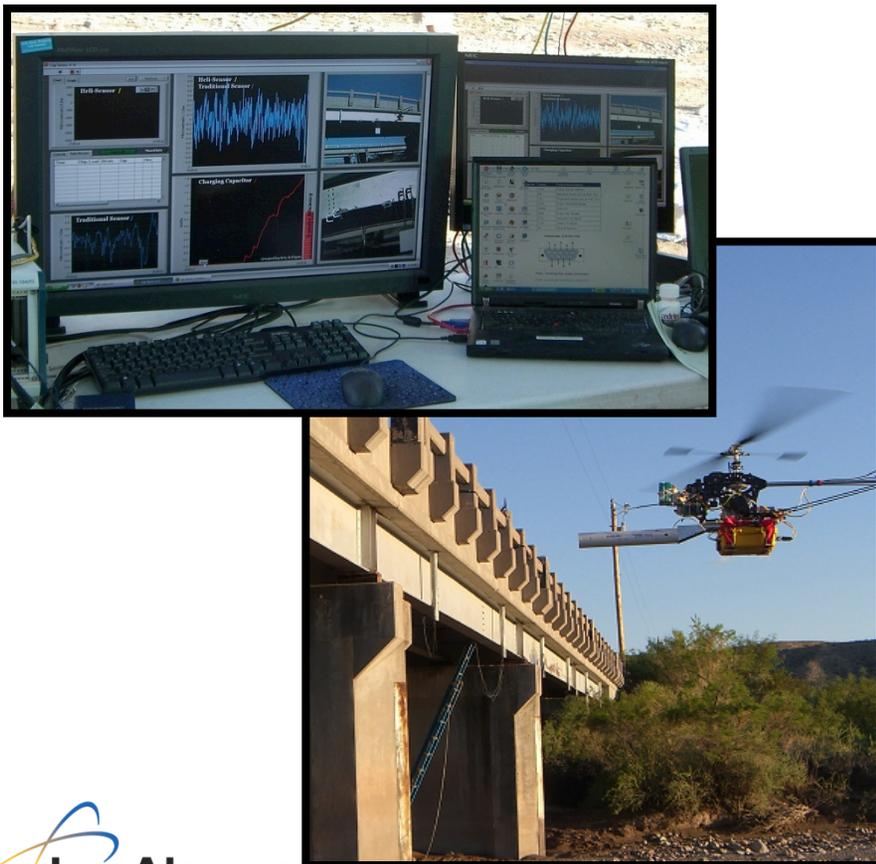


Staff Revitalization

Three courses taught by LANL Staff from T, INST, X Divisions

Joint research efforts are growing

Programmatic and educational funds are used to support jointly mentored graduate students and postdoctoral fellows



- Engineering Inst. has 24 UCSD graduate students in mechanical, electrical and computer engineering
- Information Science & Technology Inst. has 7 students supported at UCSC
- MDI has 10 students from across the college of engineering at UC Davis
- IMMS has 7 graduate students in materials science and chemistry
- IAS has put in joint proposals with budgets >\$55M in the last 9 months

Technical exchanges build collaborations

Workshops, Conferences, Tutorials and Lectures build teams for collaboration and grow our technical base

- **Seminars and tutorials in High Performance Computing**
 - Parallel I/O in Practice, PVFS in Production, High Performance Distributed File systems and Improving File System usability with Magnetic RAM
- **15 workshops or conferences aimed at teaming Lab staff with University partners to foster collaborative efforts**
 - Bio Nonproliferation
 - Damage Sensitive Features Derived from Nonlinear System Identification and Damage in Composite Materials
 - Medical radioisotope imaging conference, Meeting,
 - Santa Fe Cosmology
 - Grand Challenges in Neural Computation
- **IMMS Distinguished Lecture Series in Soft Materials**