Life at a DOE National Laboratory

Linda Young
Argonne National Laboratory
Where are the DOE national laboratories

Office of Science Laboratories

1. Ames Laboratory
   Ames, Iowa
2. Argonne National Laboratory
   Argonne, Illinois
3. Brookhaven National Laboratory
   Upton, New York
4. Fermi National Accelerator Laboratory
   Batavia, Illinois
5. Lawrence Berkeley National Laboratory
   Berkeley, California
6. Oak Ridge National Laboratory
   Oak Ridge, Tennessee
7. Pacific Northwest National Laboratory
   Richland, Washington
8. Princeton Plasma Physics Laboratory
   Princeton, New Jersey
9. SLAC National Accelerator Laboratory
   Menlo Park, California
10. Thomas Jefferson National Accelerator Facility
    Newport News, Virginia

Other DOE Laboratories

1. Idaho National Laboratory
   Idaho Falls, Idaho
2. National Energy Technology Laboratory
   Morgantown, West Virginia
   Pittsburgh, Pennsylvania
   Albany, Oregon
3. National Renewable Energy Laboratory
   Golden, Colorado
4. Savannah River National Laboratory
   Aiken, South Carolina

NNSA Laboratories

1. Lawrence Livermore National Laboratory
   Livermore, California
2. Los Alamos National Laboratory
   Los Alamos, New Mexico
3. Sandia National Laboratory
   Albuquerque, New Mexico
   Livermore, California

Legend:
- Office of Science Laboratory
- Other DOE Laboratory
- NNSA Laboratory
Who’s in charge?

Office of Science

- Advanced Scientific Computing Research
- Basic Energy Sciences
- Biological and Environmental Research
- Fusion Energy Sciences
- High Energy Physics
- Nuclear Physics

Patricia Dehmer
Deputy Director
Office of Science
National Labs provide vital ecosystems for major DOE scientific user facilities

Protein facility

Nanoscience

Chemical engineering

Chemistry

Accelerator physics

Materials and energy sciences

Biology

High performance computing & data
Moore’s law for X-ray Sources

18 orders of magnitude in 5 decades!

12 orders of magnitude in 6 decades
Linac Coherent Light Source at SLAC
X-FEL based on last 1-km of existing 3-km linac

Proposed by C. Pellegrini in 1992

1.5-15 Å
(14-4.3 GeV)

Existing 1/3 Linac (1 km)

New e⁻ Transfer Line (340 m)

X-ray Transport Line (200 m)

Injector (35°) at 2-km point

Undulator (130 m)

Near Experiment Hall

Far Experiment Hall

SLAC NATIONAL ACCELERATOR LABORATORY

Argonne National Laboratory

UCLA

LLNL
The Advanced Photon Source

7 GeV, 100 mA, 3 nm-rad
Dedicated 1996
- 66 simultaneously operating beamlines
  - 45 ID, 21 BM
- 60% physical science
- 40% biological science
- ~5000 unique users/year
Jo Frisch analogy: XFELs are to synchrotrons as

F22 Raptor
356 M$
Seats 1
Mach 2.25

Boeing 747
330 M$
Seats 400-600
Mach 0.855
International opportunities here and on the horizon
Family at National Labs

Three female staff members in XSD had children in the past 4 months

Family leave: accrued sick leave + vacation + 12 weeks w/o pay

Argonne Day Care Center
Family time