U.S. DEPARTMENT OF ENERGY | Office of Science

DOE's Office of Science National Laboratory Management

Briefing for NFAC

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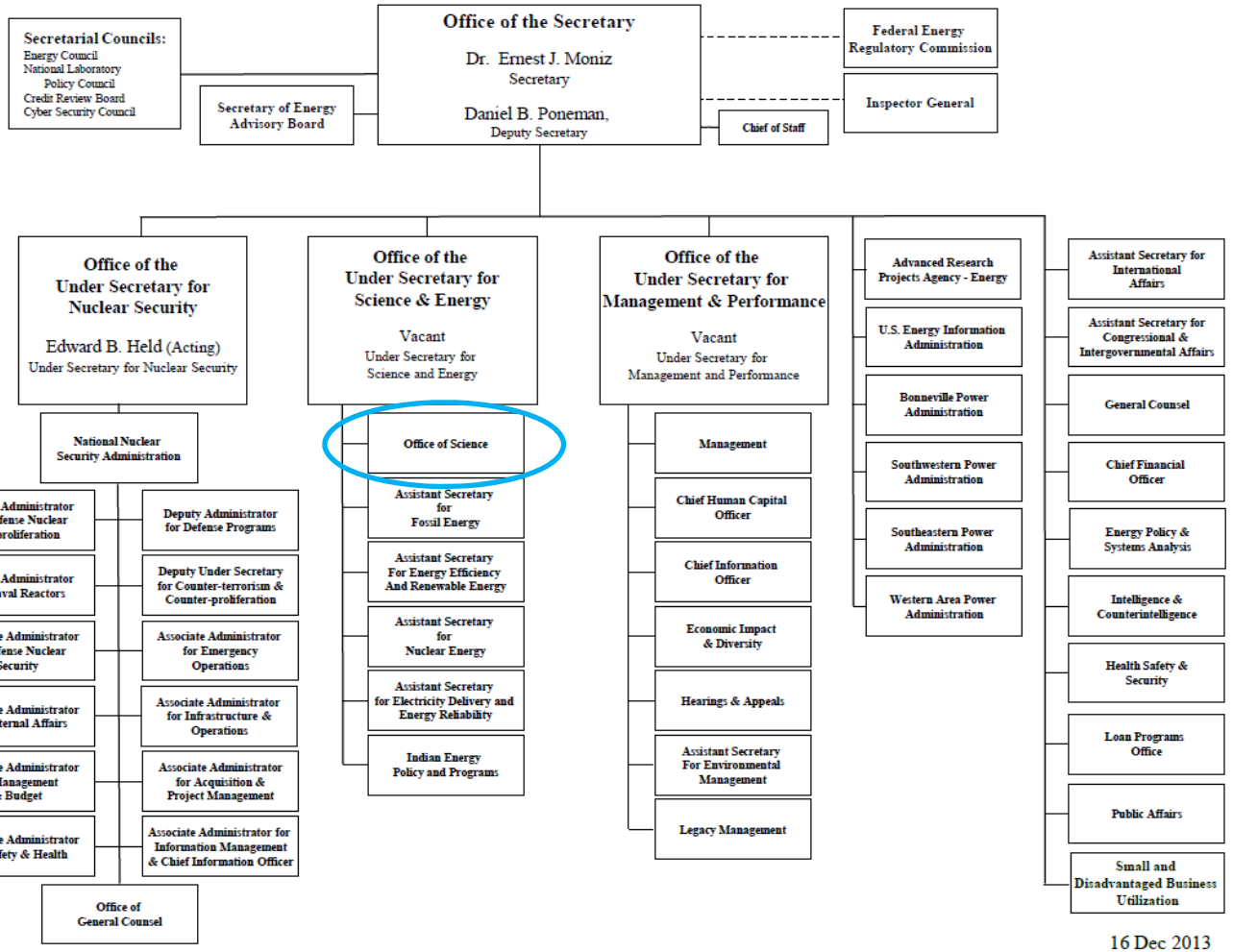
Outline of the Presentation

- DOE and the National Labs--background
- Office of Science—research and facilities
- Office of Science—evaluation of research at the DOE labs
- Office of Science—evaluation of contractor performance at the DOE labs

DEPARTMENT OF ENERGY



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What Distinguishes a DOE National Laboratory?

The U.S. Department of Energy's owns 17 national laboratories located across the country. Together, these laboratories comprise a system which was created and is supported by the federal government to:

- Execute long-term government missions with substantial scientific and technological content, and often with complex security, safety, project management, or other operational challenges;
- Develop unique scientific capabilities beyond the scope of academic and industrial institutions, to broadly benefit scientific and technological communities; and
- Develop and sustain scientific and technical capabilities deemed critical by the government, and to which the government desires assured access.

    - ***Mission driven.***
    - ***Science of scale.***
    - ***Multi-disciplinary teams.***
    - ***Distinctive, powerful research facilities.***
    - ***Safe and secure operating environments.***

Management model: Federally Funded Research and Development Center

DOE's national laboratories are almost all "Government-Owned, Contractor-Operated" laboratories, managed under a unique legal relationship by a Management and Operating (M&O) contractor (typically university, non-profit or industrial contractors.)

The M&O/GOCO model allows the contractors to bring the best private sector personnel and research management practices to the national laboratories, and provides the laboratories with the flexibility necessary to broadly engage academia and the private sector.

National laboratory contractors are selected competitively, under a procurement policy designed to support robust performance management, and balance DOE's interests in obtaining best value with the benefits of long-term relationships and stability for which the M&O/GOCO model was designed.

For M&O/GOCO labs, federal oversight is provided from HQ and Federal "site offices"

Most Labs receive funds from multiple sources – DOE, federal, other

The DOE National Laboratory System

Office of Science Laboratories

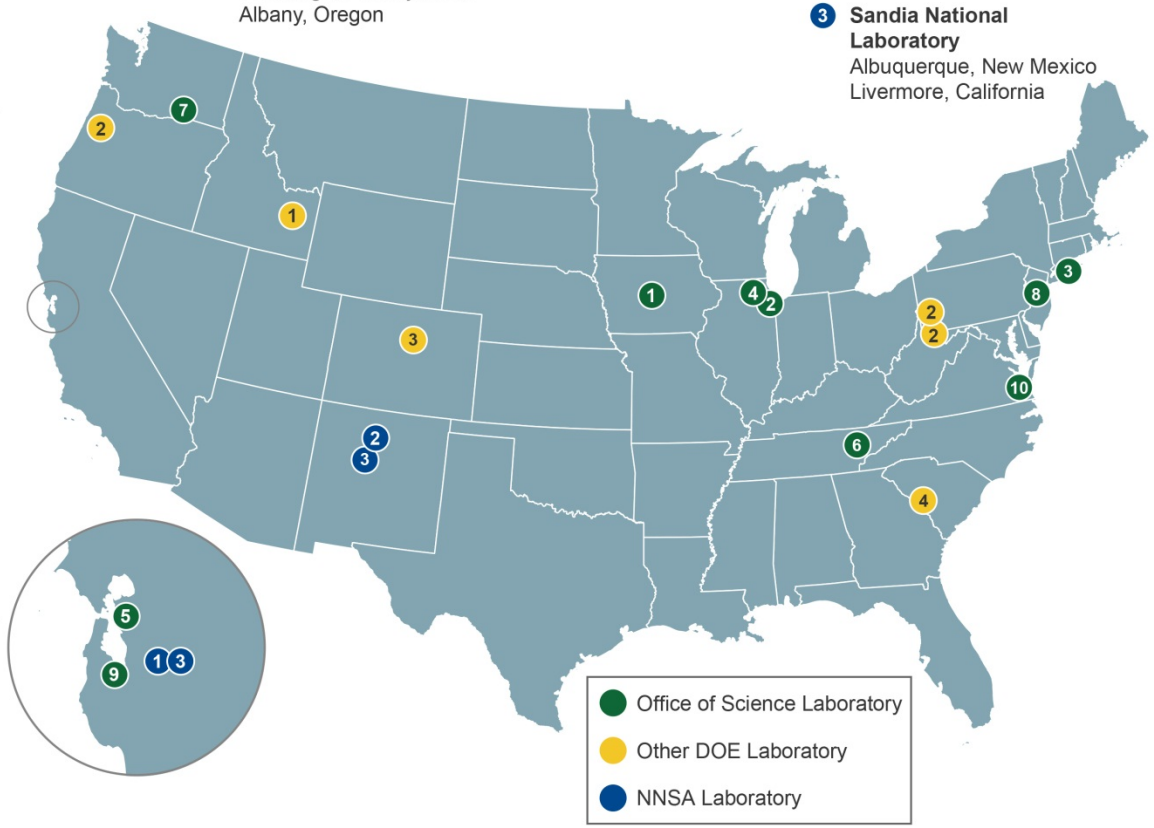
1. **Ames Laboratory**
   Ames, Iowa
2. **Argonne National Laboratory**
   Argonne, Illinois
3. **Brookhaven National Laboratory**
   Upton, New York
4. **Fermi National Accelerator Laboratory**
   Batavia, Illinois
5. **Lawrence Berkeley National Laboratory**
   Berkeley, California
6. **Oak Ridge National 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

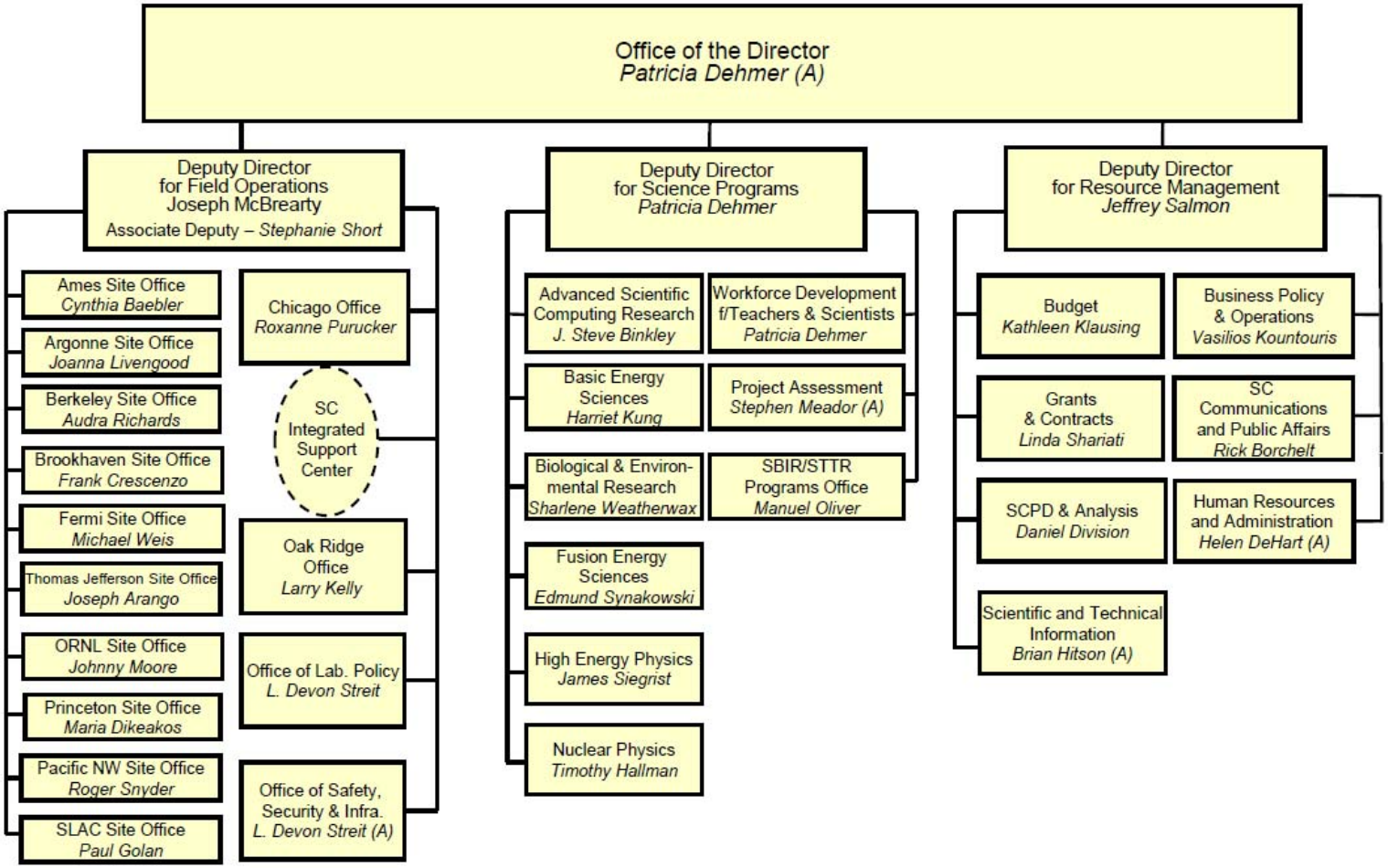
Other DOE Laboratories

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





Updated 01/08/14

Office of Science

~$5 billion per year

The Frontiers of Science

- Supporting research that led to over 100 Nobel Prizes during the past 6 decades—more than 20 in the past 10 years
- Supporting 25,000 Ph.D. scientists, graduate students, undergraduates, engineers, and support staff at more than 300 institutions
- Providing 45% of Federal support of basic research in the physical and energy related sciences and key components of the Nation's basic research in biology and computing

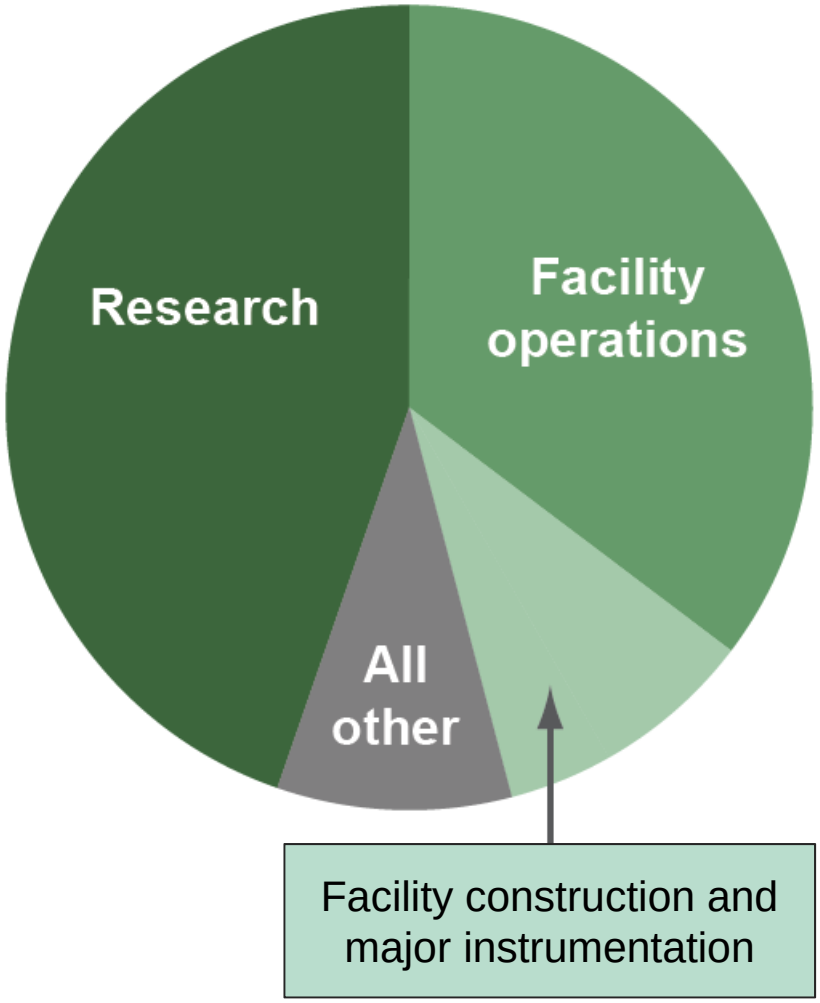
21st Century Tools of Science

- Providing the world's largest collection of scientific user facilities to over 29,000 users each year

The undulator hall at the Linac Coherent Light Source, SLAC, 2011.

Office of Science Budget by Research & Facilities

>40% of SC funding is provided to the scientific user facilities



User facilities address needs of the scientific community not met by other government agencies, public organizations, private entities, or international bodies.

Scientific User Facilities Characteristics

1. The facility is open to all interested potential users without regard to nationality or institutional affiliation.

2. Allocation of facility resources is determined by merit review of the proposed work.

3. User fees are not charged for non-proprietary work if the user intends to publish the research results in the open literature. Full cost recovery is required for proprietary work.

4. The facility provides resources sufficient for users to conduct work safely and efficiently.

5. The facility supports a formal user organization to represent the users and facilitate sharing of information, forming collaborations, and organizing research efforts among users.

6. The facility capability does not compete with an available private sector capability.

National Laboratory Funding Modalities

Limited Term Projects

- Response to specific targeted Funding Opportunity Announcements
- All proposals are merit reviewed, most by peer review panels.
- Collaborations with universities are encouraged
- Projects have a defined scope, and are funded for a specific time period

Scientific Focus Areas (SFAs) – Integrated Team Funding to DOE Labs

- In 2009, research programs map to broad BER (Biological and Environmental Research program) research budget categories.
- SFAs must be coherent, cohesive, long-term programs that reflect coordination and collaboration among individual and teams of investigators across National Lab divisions and institutions.
- SFAs established by competitive merit review; progress is evaluated on annual basis and triennial peer reviews (often on-site)

Annual Laboratory Planning Guidance

Each year the Department of Energy (DOE) Office of Science (SC) engages its laboratories in a strategic planning activity that asks the laboratory leadership teams to define an exciting, yet realistic, long-range vision for the future of their respective laboratories. This information provides the starting point for a discussion between the SC leadership and the laboratory about the laboratory's future directions, strengths and weaknesses, immediate and long-range challenges, and resource needs. The results of these discussions are intended to be four-fold:

- An understanding of the directions in which the current contractor and laboratory leadership wishes to develop the laboratory;
- A shared understanding of how these plans fit or don't fit with DOE/SC's long-range scientific priorities and operational goals;
- A written ten-year plan for the laboratory that reflects DOE/SC's view of the future of the laboratory; and
- Written materials addressing a variety of DOE reporting requirements

The National Labs Receive Annual Report Cards

Performance Goal Grade

1. Mission Accomplishment
2. Design, Fabrication, Construction and Operations of Research Facilities
3. Science and Technology Program Management
4. Sound and Competent Leadership and Stewardship of the Laboratory
5. Integrated Safety, Health, and Environmental Protection
6. Business Systems
7. Operating, Maintaining, and Renewing Facility and Infrastructure Portfolio
8. Integrated Safeguards and Security Management and Emergency Management Systems

Grades are posted on the web!

Letter Grade	Numerical Grade	Definition
A+	4.3-4.1	Significantly exceeds expectations of performance against all aspects of the Objective in question. The Contractor's systems function at a level that fully supports the Laboratory's current and future science and technology mission(s). Performance is notable for its significant contributions to the management and operations across the SC system of laboratories, and/or has been recognized by external, independent entities as exemplary.
A	4.0-3.8	Notably exceeds expectations of performance against all aspects of the Objective in question. The Contractor's systems function at a level that fully supports the Laboratory's current and future science and technology mission(s). Performance is notable for its contributions to the management and operations across the SC system of laboratories, and/or as been recognized by external, independent entities as exemplary.
A-	3.7-3.5	Exceeds expectations of performance against all aspects of the Objective in question. The Contractor's systems function at a level that fully supports the Laboratory's current and future science and technology mission(s).
B+	3.4-3.1	Meets expectations of performance against all aspects of the Objective in question. The Contractor's systems function at a level that fully supports the Laboratory's current and future science and technology mission(s). No performance has, or has the potential to, adversely impact 1) the delivery of the current and/or future DOE/Laboratory mission(s), 2) the DOE and/or the Laboratory's reputation, or does not 3) provide a sustainable performance platform.

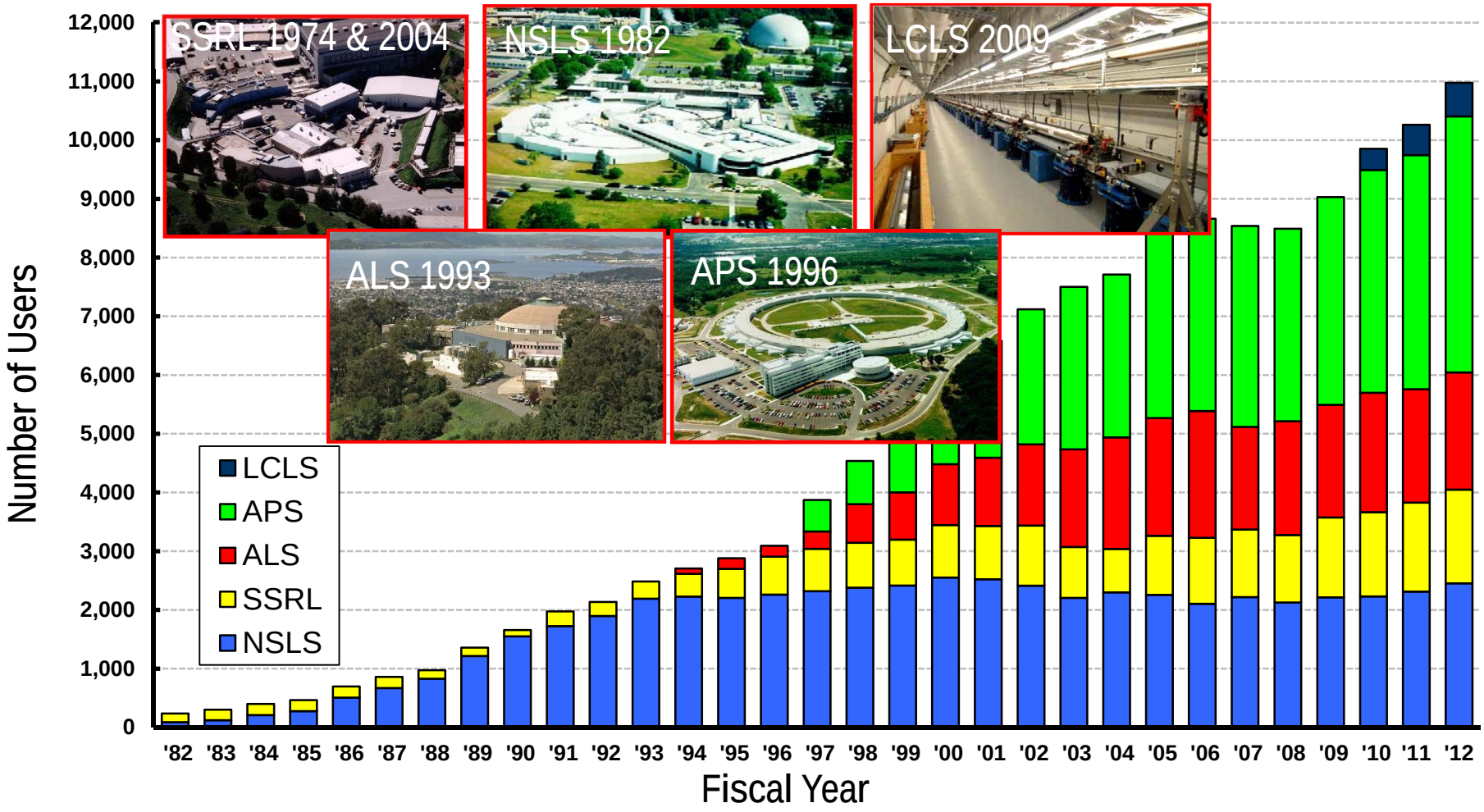
How do we measure scientific success? Lab vs. University

National Labs	Universities
Merit Review	**No defined institutional goal** **Success = $**
Lab Performance Appraisal— **Goal 1: Provide for Efficient and Effective Mission Accomplishment**	**Merit Review by 10 CFR Part 605**
high-quality, original, and creative results that advance science and technology	Scientific and/or technical merit or the educational benefits
sustained scientific progress and impact	Appropriateness of the proposed method or approach
receives appropriate external recognition of accomplishments	Competency of personnel and adequacy of resources
contributes to overall DOE research and development goals	Appropriate budget Other factors specified in the solicitation

Creation of the 10 DOE/SC labs – Many for “Big Science”

1931	**LBNL**	**E.O. Lawrence and the cyclotron at the “Rad Lab”**
1943	**ORNL**	**Nuclear reactor technology**
1946	**ANL**	**Nuclear reactor technology**
1947	**AMES**	**High-purity uranium production; heavy-element chemistry**
1947	**BNL**	**Construction/operation of large facilities for NE universities**
1951	**PPPL**	**Magnetic fusion research**
1962	**SLAC**	**(Electron) accelerator technology; particle physics research**
1965	**PNNL**	**Independent R&D associated with the Hanford site**
1967	**FNAL**	**(Proton) accelerator technology; particle physics research**
1984	**TJNAF**	**(Electron) accelerator technology; nuclear physics research**

Growth of External Users at the Labs Transformed those Labs



The 10 DOE/SC Labs Today

1931	LBNL	Multiprogram; bio, chem, materials, computing, light sources, energy technologies, …
1943	ORNL	Multiprogram; bio, chem, materials, computing, neutron sources, energy technologies, …
1946	ANL	Multiprogram; chem, materials, computing, energy technologies
1947	AMES	Rare earth materials, chem, catalysis
1947	BNL	Multiprogram; chem, materials, nuclear physics, light sources, heavy-ion collision physics; moving into energy technologies
1951	PPPL	Magnetic fusion research (no change)
1962	SLAC	Multiprogram; materials, light sources, free-electron laser technology, astrophysics, (electron) accelerator technology
1965	PNNL	Multiprogram/multisponsor (SC < 20%); bio, chem, significant DHS and NNSA work; energy technologies
1967	FNAL	(Proton) accelerator technology; particle physics research (in the process of change from energy frontier to intensity frontier phys)
1984	TJNAF	(Electron) accelerator technology; nuclear physics research (no change)