



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# DOE Office of Science Perspectives on Large-Scale Research Infrastructure

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U.S.–ELI (Extreme Light Infrastructure) Joint Workshop  
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U.S. Department of Energy*

# Wide variation in infrastructure types

- ▶ **Localization**
  - ▶ Single-site
  - ▶ Distributed
  - ▶ Virtual
- ▶ **Purpose and community served**
  - ▶ Dedicated/single-experiment
  - ▶ Support center
  - ▶ Service organization
  - ▶ User facility
- ▶ **Scale**
  - ▶ Wide variation (in funds needed, staffing, physical space, etc.)





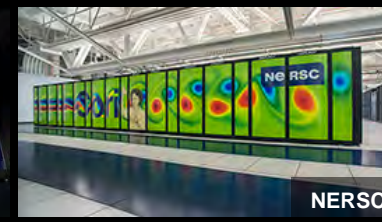
# FY 2019 27 Scientific User Facilities



OLCF



ALCF



NERSC



ESnet



EMSL



ARM



JGI



SNS



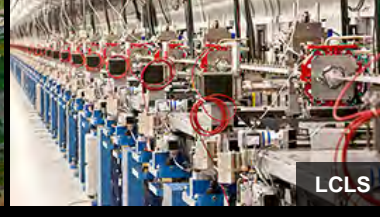
HFIR



ALS



APS



LCLS



NSLS-II



SSRL



CFN



CINT



CNM



CNMS



TMF



DIII-D



NSTX-U



CEBAF



ATLAS



RHIC



FACET



ATF



Fermilab AC



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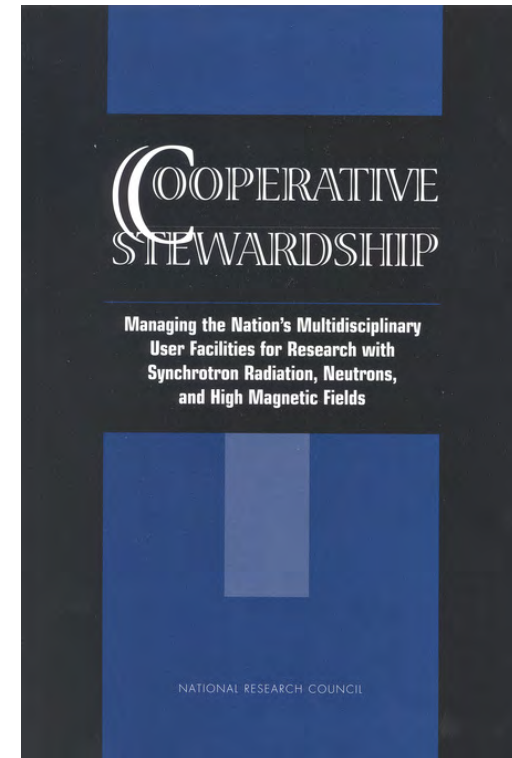
# User facility access and other policies

- ▶ All Office of Science user facilities are open to scientists worldwide. Contingent on certain eligibility requirements and on merit-based peer review, foreign researchers are welcome to use the facilities free-of-charge; there are no separate criteria for prospective users from foreign countries.
- ▶ Definition: A user facility is a federally sponsored research facility available for external use to advance scientific or technical knowledge under the following conditions:
  - ▶ The facility is open to all interested potential users without regard to nationality or institutional affiliation.
  - ▶ Allocation of facility resources is determined by merit review of the proposed work.
  - ▶ 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 required for proprietary work.
  - ▶ The facility provides resources sufficient for users to conduct work safely and efficiently.
  - ▶ The facility supports a formal user organization to represent the users and facilitate sharing of information, forming collaborations, and organizing research efforts among users.
  - ▶ The facility capability does not compete with an available private sector capability.



# Sole Ownership, Cooperative Stewardship

- ▶ DOE SC informally adheres to the principles articulated in the National Academies report on *Cooperative Stewardship* (1999)
- ▶ This was developed to address management of a certain subset of facilities, but is applicable to a broad range of research infrastructure.
- ▶ Critical principle: a sole sponsor must be responsible for the life cycle stewardship and core operations of a user facility
  - ▶ “The steward should be the sole operating authority for a user facility. This means that management responsibility for the design, construction, operation, maintenance, and upgrading of the core of that facility rests with the steward. Additional stewardship responsibility extends to general policy issues, such as user agreements, intellectual property rights, performance evaluation, and safety training for users, as well as the coordination of strategic and financial planning with partner agencies.”



# Collaboration approaches and mechanisms

Increasing complexity

- ▶ Utilization of facilities as users via merit-based peer review is often the simplest and most effective approach
- ▶ Individual collaborations are most readily supported through our standard support of investigator-initiated research via merit-reviewed university grants or National Laboratory allocations
- ▶ Cooperation between individual DOE National Laboratories and individual foreign institutions can be established with, e.g., international Cooperative Research and Development Agreements (i-CRADAs), which act as legal international contracts
- ▶ Non-binding declarations such as Statements of Interest or Memoranda of Understanding can help to facilitate interaction on larger scales and when there are multiple institutions involved
- ▶ Formal government-to-government international agreements are established at the Departmental/Ministerial levels where needed

Flexibility (and fitness for purpose) is key!



# International Discussions on Research Infrastructure

- ▶ The U.S. engages in several international groups that discuss research infrastructure practices, policy, and collaboration opportunities:
  - ▶ The Group of Senior Officials (**GSO**) on Global Research Infrastructures (GRIs), under the G7 Science Ministers
  - ▶ The Global Science Forum (**GSF**) of the OECD
  - ▶ The Global Research Council (**GRC**) – heads of national research funding organizations
  - ▶ And there are, of course, others, for example the European Strategy Framework for Research Infrastructure (**ESFRI**)
- ▶ For example: the GSO has developed and published a “Framework” of good practices for global research infrastructures
  1. Core purpose of Global Research Infrastructures
  2. Partnership management
  3. Defining scope, schedule, and cost
  4. Project and operations management
  5. Contribution management
  6. Periodic reviews
  7. Termination or decommissioning
  8. Access goal based on merit review
  9. e-infrastructure
  10. Data management
  11. Clustering of Research Infrastructures
  12. International mobility
  13. Innovation, Technology Transfer and Intellectual Property
  14. Monitoring impacts





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