Funding @ ASCR

ASCR Program Structure

US Department of Energy (DOE), Office of Science (SC), Advanced Scientific Computing Research (ASCR)
https://science.osti.gov/ascr

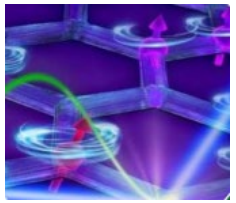
Facilities Division

National user facilities: ALCF, OLCF, NERSC, ESNet

Research Division

Advanced Computing Technologies (ACT) Division

Quantum, microelectronics, cybersecurity, emerging technologies (e.g., neuromorphic), etc.



Computer Science

- Software/tools to make high-performance computers and networks productive and efficient, workflows, FAIR data, etc.

Applied Mathematics

- Scalable numerical algorithms, machine learning, data analysis, uncertainty quantification, etc.

Computational Partnerships

- https://www.scidac.gov/
- SciDAC institutes, SciDAC partnerships, etc.
- Collaborations between math/CS and discipline scientists

For more information, see our FY22 budget request.

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ASCR Funding Entry Points

Funding Opportunity Announcements (FOAs)

- https://science.osti.gov/ascr/Funding-Opportunities
- Announced on grants.gov (hint: sign up for email notifications for 'ASCR')
- Read each announcement carefully to understand who can apply and other restrictions/requirements
- Depending on the announcement, supports 2–5-year projects
- University researchers can apply directly (please coordinate with your organization's sponsored-research office)
- Subcontracting is often permitted, and sometimes collaborative applications are permitted

Early Career Research Program

- https://science.osti.gov/early-career
- Research grants for five years
- Stays with PI if PI changes institutions
- Eligible within 10 years of Ph.D. (can apply up to three times)
- University-based researchers receive about $150,000/year
- Topics released in the summer, pre-applications generally due in the fall

DOE National Laboratory Announcements

- https://science.osti.gov/ascr/Funding-Opportunities (bottom of the page)
- Open only to DOE Laboratories
- Often allow subcontracts to support collaborators at other organizations

Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR)

- https://science.osti.gov/sbir
- Grants to for-profit US businesses with 500 or fewer employees (including affiliates)
- Phase I: ~$200k for 6-12 months, Phase II: ~$1M for 2 years
- Subcontracting is permitted, STTR: requires collaboration with a research Institution
- Topics released in the summer, pre-applications generally due in the fall

Computational Science Graduate Fellowship (CSGF)

http://www.krellinst.org/csgf/

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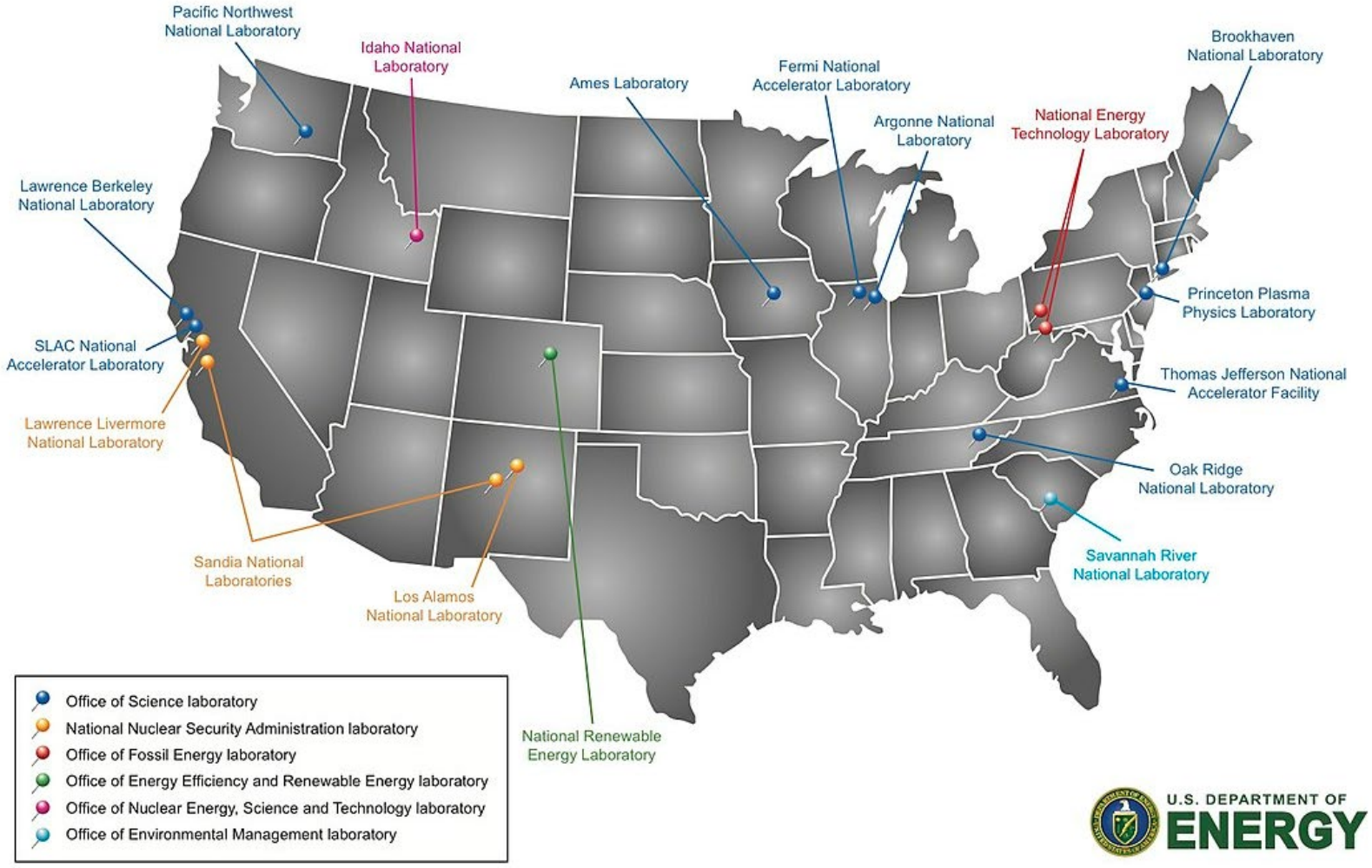
DOE National Laboratories



https://www.energy.gov/maps/doe-national-laboratories

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ASCR Website

https://science.osti.gov/ascr/Funding-Opportunities

https://science.osti.gov/ascr/Community-Resources/Program-Documents

- About
- Research
- Facilities
- Science Highlights
- Benefits of ASCR
- **Funding Opportunities**
  - Closed Funding Opportunity Announcements (FOAs)
  - Closed Lab Announcements
  - Award Search / Public Abstracts
  - Additional Requirements and

Funding Opportunities

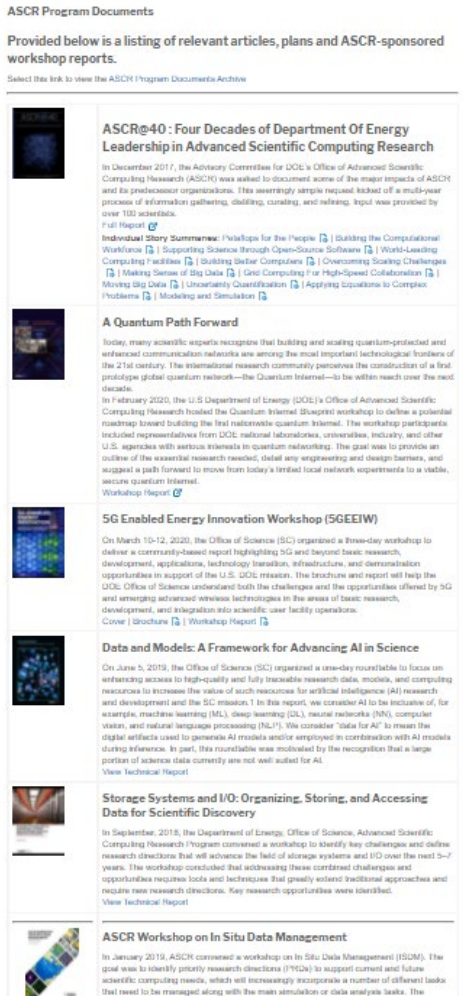
germane to the mission of DOE, and
solicitations for each research progra
selection of researchers to fund is ba
solicitation. For the most current info
shows the original posting dates, cha

Office of Science Guidance on A

Look at past opportunity announcements

Look at abstracts for current awards

Look at recent reports from ASCR-sponsored workshops. These discuss priority research directions, as identified by the research community, along with relevant background information, in various areas.



ASCR Program Documents

Provided below is a listing of relevant articles, plans and ASCR-sponsored workshop reports.

Select this link to view the ASCR Program Documents Archive

ASCR@40 : Four Decades of Department Of Energy Leadership in Advanced Scientific Computing Research

A Quantum Path Forward

5G Enabled Energy Innovation Workshop (5GEEIW)

Data and Models: A Framework for Advancing AI in Science

Storage Systems and I/O: Organizing, Storing, and Accessing Data for Scientific Discovery

ASCR Workshop on In Situ Data Management

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Potentials Areas of Investment Highlighted by ASCAC

ASCR's federal advisory committee, the Advanced Scientific Computing Advisory Committee (ASCAC), released a report in October 2020, *Transitioning ASCR after ECP*, which highlighted the following areas for future research (see recommendation B.1 in https://science.osti.gov/-/media/ascr/ascac/pdf/meetings/202004/Transition_Report_202004-ASCAC.pdf*):*

- Computer Science
  - **Computer architecture** - specialization, complex heterogeneous nodes, and new devices
  - **Balanced computer architectures** – codesign of hardware and applications for cases with lower compute-to-data-movement ratios
  - **Performance portability** – compilers, libraries, and languages to enable automation and high-productivity human-guided mapping (placement, schedule, and resource management) from one architecture to the next
  - **Data management/workflows** - automated resource management, complex storage and memory hierarchies, complex (distributed) workflows, authentication
  - **Development and application of ontologies** – integrating knowledge and reasoning to power AL/ML systems
  - **Distributed Computing and Data Ecosystem** – cross-facility/cloud-federated HPC, storage, and high-speed networking
  - **Edge computing** – smart detectors and associated high-performance *embedded* computing at the edge, data management and advanced networking, 5G based distributed sensing
  - **Complexity, Correctness, and Reproducibility** – new tools for debugging and verifying both functionality and performance
  - **Enabling the use of mainstream languages and libraries** – Python, Julia, Ruby, and Go; Jupyter; PyTorch, Caffe, TensorFlow
  - **Security Research** - making distributed systems and operating systems secure
  - **Productivity research** – studying how people produce and use research software
  - **Networking** – new devices and stacks; transmission, routing, buffering, and flow-control protocols
- Mathematics
  - Areas include **Fast or low complexity algorithms**, **Sparsity**, **Non-convex optimization**, **Quadrature and the efficient representation of functions/solutions**, **Preconditioning**, **New algorithms and numerical methods for new devices**, and **New forms of PDE solving**