CASC | Coalition for Academic Scientific Computation

CASC Response to American Science Acceleration Project (ASAP)

Submission Deadline: 6/30/2025

We are preparing a response to the Rounds-Heinrich American Science Acceleration Project (ASAP), which seeks public input on strategies to advance U.S. science and innovation: https://www.rounds.senate.gov/newsroom/press-releases/rounds-heinrich-seeking-public-input-on-initiative-to-accelerate-advancements-in-american-science-asap

One area of particular interest in our discussions has been the development of regional networks of research computing and data centers. Please share your bullet points or draft language by June 23 to help align and amplify messaging across the community.

CASC Member Representative / Institution / Email

1. Input Item

CASC Response to the American Science Acceleration Project (ASAP) Request for Information
Submitted by the Coalition for Academic Scientific Computation (CASC)
Draft 06.25.25

Overview

The Coalition for Academic Scientific Computation (CASC) strongly supports the goals of the American Science Acceleration Project (ASAP) to radically reduce the time from discovery to deployment across the U.S. scientific enterprise. CASC members, representing leading research universities, medical centers and national supercomputing centers, believe that accelerating scientific discovery requires a coordinated investment in research computing, AI-driven productivity tools, data interoperability, and a reform of legacy scientific processes. We are prepared to partner with federal agencies and congressional offices to lead these efforts.

Key Recommendations

1. Advance a Federated AI and Data Ecosystem
    - Develop a national protocol for privacy-preserving distributed machine learning that aligns with open-source and scientific community norms.
    - Ensure institutions retain control over their data and infrastructure while enabling secure participation in collaborative AI development.
    - Incentivize institutions to curate and share domain-specific, high-quality datasets for research and AI training.

2. Enable Faster Science through AI and Automation
    - Support development and adoption of AI tools that automate data analysis, validation and verification, hypothesis generation, and logical and experimental validation.
    - Fund productivity tools that streamline bureaucratic procedures and remove technical friction in the scientific process (e.g., reproducible workflows, metadata pipelines, high-throughput screening).
    - Encourage AI/ML benchmarking initiatives and challenge problems driven by the research community.

3. Accelerate Discovery with Research Computing Infrastructure
    - Prioritize funding for interoperable research computing platforms.
    - Invest in federated learning infrastructure and a distributed national AI network that enables collaborative, privacy-preserving machine learning at scale.
    - Recognize compute, data, and software as essential scientific infrastructure, akin to mass spectrometers, lasers, magnetic resonance and CryoEM imaging instruments, telescopes and particle accelerators.

4. Demonstrate Impact with High-Visibility Use Cases
    - Launch cross-institutional demonstration projects in areas such as biomedical AI, forest fire and storm management, materials discovery, or digital twins.

    - Highlight examples of accelerated science processes from pandemic response and other real-world cases.

    - Frame science acceleration as essential to national security, economic competitiveness, and public health.

5. Reform the Scientific Publishing and Research Validation System
    - Elevate datasets, metadata, and uncertainty quantification to first-class, citable research outputs.
    - Support alternative publishing platforms that emphasize openness, reproducibility, and real-time dissemination.
    - Fund AI-powered tools for fraud detection, reproducibility validation, and literature synthesis.

6. Strengthen the Research Workforce and Incentive Structures
    - Expand investment in training research software engineers, data scientists, and cyberinfrastructure professionals to professionalizing and sustain the technical research workforce.
    - Support interdisciplinary team science models that incentivize embedding technical experts into research teams.
    - Explore outcomes-based credentials and alternative incentives tied to research productivity.

7. Support Alternative Funding Models
    - Pilot a scientific marketplace where universities and consortia can bid to solve national challenges.
    - Leverage mid-scale, cross-agency funding mechanisms that promote flexibility, scale-up, and commercial partnerships.
    - Align funding with mission-driven R&D goals and minimize regulatory and compliance burdens that slow research.

<u>CASC Leadership Role</u>

CASC is uniquely positioned to:

- Serve as a coordinating body for national benchmarking, federated infrastructure development, and open data initiatives.
- Launch a working group on AI and research computing aligned with ASAP goals.
- Produce a white paper on Accelerated Science through AI and Computing.
- Host an annual summit focused on cross-sector collaboration in AI-driven discovery.

<u>Immediate Action Items</u>

- Identify and quickly initiate 1-3 high-impact demonstration projects.
- Convene CASC members to develop interoperable data standards and reproducible workflows.
- Partner with federal agencies to define and implement the distributed AI network protocol.

- Collaborate with congressional offices on messaging that connects science funding to national prosperity.

Conclusion

To realize the vision of the American Science Acceleration Project, the U.S. must invest in an ecosystem that makes fast, collaborative, AI-enabled science the default. This requires bold action to modernize research computing infrastructure, overhaul antiquated publishing and validation systems, expand and upskill the scientific workforce, and enable secure, scalable AI deployment across institutions. CASC and its member institutions are prepared to play a leadership role in driving this transformation, working in close partnership with federal agencies, academic institutions, and industry.