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United States Department of Energy
Office of Science
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> **Re:** **RFI Response: Mobilizing Talent for the Genesis Mission and Developing an American Workforce to Advance Artificial Intelligence (AI) for Science and Engineering**

The University Corporation for Advanced Internet Development (d/b/a "Internet2") submits these comments in response to the Office of Science's Request for Information, which seeks input on strategies to fulfill the goals of the Genesis Mission, specifically as it relates to "forging partnerships between DOE, institutions of higher learning, industry, and philanthropic organizations to meet" these goals. Internet2 respectfully recommends the following with respect to certain questions posed by the Office of Science:

<u>**Question 1**</u>

How can DOE catalyze research collaborations between DOE National Laboratories, universities, and industry to meet the goals of the Genesis program?

DOE can catalyze impactful collaborations by pairing mission-driven leadership with scalable, interoperable infrastructure that reduces barriers to participation across sectors.

Internet2 recommends that DOE:

- **Consider consortial collaboration models** anchored by DOE National Laboratories and user facilities, with structured participation from universities and industry. The NSF AI Institutes program, for example, established more than two dozen cross-sector partnerships, each aimed at a particular domain area, which one could envision aligning to Genesis Mission's Lighthouse Challenges. The NSF-funded Regional Innovation Engines represent another cross-sector partnership model that emphasizes university collaborations with the non-profit and for-profit sectors. Such an approach could help translate scientific discoveries into the commercial innovations essential to fully addressing the Lighthouse Challenges.

- **Reduce cross-institutional friction** by standardizing secure access to data, computing, and facilities through federated identity, authorization, and trust frameworks. The Internet2 InCommon Federation demonstrates this model today by enabling trusted authentication across research organizations, and DOE could further strengthen collaboration by recognizing federated credentials supported by community-based identity proofing to establish consistent researcher assurance levels across institutions.

- **Support shared AI-for-science reference architectures** that enable distributed workflows across laboratories, campuses, and commercial cloud environments. Such reference architectures can help ensure that the best ideas, from all types of institutions, are brought to bear on the Lighthouse Challenges.

- **Leverage challenge problems and shared datasets** aligned with DOE missions to drive sustained collaboration and reproducible research outcomes. Open-science "Genesis DMZs" should be established to ensure maximum participation and collaboration from the academic and commercial sectors and to provide stepping-stone environments that prepare researchers to leverage Genesis-scale resources at DOE national labs.

Internet2, a nonprofit research and education organization serving the U.S. research community, has extensive experience enabling these models through advanced research networking, federated identity and access management, and secure, high-performance data movement across academic, government, and industry environments.

Question 2

How can DOE incentivize partnerships between universities, DOE National Laboratories, industry, and philanthropic organizations to (1) establish new training paths for bachelor's and master's degrees focused on dual competencies in AI and scientific/engineering disciplines and (2) provide innovative experiences to prepare doctoral students and post-doctoral associates for careers in AI for science?

DOE can incentivize partnerships by prioritizing funding for collaborative programs that require universities, national laboratories, industry, and other stakeholders to work together on integrated training, research, and supporting infrastructure. The AI-enabled future to be developed by the Genesis Mission will also require a new generation of AI-savvy IT professionals prepared to deploy, secure, operate, and maintain the increasingly complex computational infrastructure necessary to support the nation's energy portfolio.

Effective incentives include:

- **Consortium-based awards** that require participation from universities, DOE National Laboratories or user facilities, and industry partners. These awards must include embedded plans for contributing to the training of students within and beyond the consortium.

- **Bundling curriculum development with access to real research environments**, including data, computing, and secure collaboration platforms. These platforms must be complemented by expert application and technical support to allow a wider range of faculty to apply these environments in their classrooms.

- **Standardized partnership frameworks** (e.g., model agreements for student placements, data access, and joint supervision) to reduce administrative burden and time-to-launch. The existing "co-op" model of undergraduate training offers a particular example and one which could be extended to industry partners and the national labs participating in the Genesis Mission. DOE should expand these public-private frameworks for data governance, intellectual property, and sustained access commitments. Such partnerships should continue to align with federal scientific values.

- **Embedded experiential learning requirements**, such as lab rotations, internships, and capstone projects aligned with DOE mission challenges. Industry partners can support universities by offering internship opportunities and providing support for targeted capstone projects. In addition, the cyberinfrastructure workforce is a critical enabler of AI in science, yet remains chronically overlooked in terms of support.

Internet2 is well positioned to support these partnerships by convening participants, enabling interoperable access to shared resources, and facilitating distributed training environments across institutions.

Question 4

Beyond funding, what other opportunities could DOE, including its National Laboratories and user facilities, bring to these partnerships?

DOE can contribute unique non-financial assets that substantially enhance training and research outcomes, including:

- **Access to DOE National Laboratories and user facilities** for student research projects, internships, and capstone experiences. Such facilities should emphasize frictionless access—distinct "education enclaves" focused on training objectives—and include dedicated support staff aimed at student success.

- **Mission-relevant datasets and benchmark problems** designed for AI-enabled science and engineering. DOE can leverage the data-sharing infrastructures and experiences of other mission agencies, including NASA, NOAA, and NIH. DOE can also bring opportunities for cross-agency standardization for AI-readiness of datasets and benchmarks.

- **Mentorship and co-advising** by DOE scientists and engineers.

- **Access pathways to advanced computing resources**, including high-performance and AI-focused systems. DOE should partner with campuses and other agencies' cyberinfrastructure ecosystems, especially NSF, to support smaller-scale "step-up" resources that allow researchers to conduct essential early work and prepare to scale up to the DOE Genesis systems.

- **Operational expertise** in data stewardship, cybersecurity, and research compliance.

These assets are most effective when paired with infrastructure that enables secure, scalable access across institutions, such as the advanced networking and trust services supported by Internet2.

Question 6

Beyond funding, what types of contributions could industry and philanthropic organizations make to enhance these partnerships and enrich the experiences of the students?

Industry and philanthropic organizations can strengthen Genesis-aligned partnerships by providing:

- **Real-world problem statements, tools, and platforms**, including cloud credits and AI software environments.
- **Paid internships, co-ops, and sponsored research projects** tied to AI-for-science use cases.
- **Practitioner mentors and guest instructors** to align training with evolving workforce needs.
- **Support for shared educational resources**, including open courseware and community datasets.
- **Philanthropic investments in student support**, such as scholarships and stipends that broaden participation and improve completion.

Question 10

How could partnerships between DOE, universities, and industry provide new training opportunities for students to best prepare them for private and public sector jobs?

Partnerships can create high-impact training opportunities by:

- **Embedding students in DOE mission-driven research environments**
- **Co-developing internships, fellowships, and capstone projects** with public- and private-sector partners
- **Providing rotational experiences** across universities, DOE National Laboratories, and industry settings
- **Aligning competencies and credentials** with workforce needs across sectors

Internet2 is well positioned to support these efforts by enabling secure, high-performance connectivity and federated access to shared research and training environments across institutions.

Question 13

How could community colleges and other educational institutions contribute and be included in this pipeline?

Community colleges and other educational institutions play a critical role in expanding and diversifying the AI-for-science and infrastructure-for-AI workforce pipeline by:

- Offering **early, stackable credentials** in data literacy, applied AI, IT-for-AI systems administration, and domain fundamentals
- Establishing **articulation and transfer pathways** into bachelor's and master's degree programs
- Participating in **shared, remote-access research and training environments** supported by robust networking and federated trust
- Partnering regionally with universities, DOE National Laboratories, and employers to align training with workforce demand

Internet2 is well positioned to help enable inclusion by supporting the technical and trust foundations that allow institutions of varying size and capacity to participate fully in Genesis-aligned partnerships.

Conclusion

Internet2 respectfully submits this response to inform DOE's Genesis Mission. As a nonprofit organization with a long-standing role as a trusted convener and enabler of advanced research infrastructure, Internet2 is well positioned to support scalable partnerships, AI-enabled science, and workforce development that strengthen U.S. leadership and national competitiveness.

Respectfully submitted,

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