

**DOE - Office of Science: The Genesis Mission: Transforming Science and Energy with AI - Checklist**

**RFA:** [DE-FOA-0003612](#)

**Submission Deadlines:**

**FY26 Phase I Applications: April 28, 2026, at 11:59 PM Eastern**

FY26 Phase II Letters of Intent: April 28, 2026, at 5 PM Eastern

FY26 Phase II Applications: May 19, 2026, at 11:59 PM Eastern

Phase II Applications resulting from FY26 Phase I Awards: December 17, 2026, at 11:59 PM Eastern

**INTRODUCTION**

**Executive Summary:**

The DOE Office of Science (SC), Office of Critical Minerals and Energy Innovation (CMEI), Office of Environmental Management (EM), Office of Nuclear Energy (NE), Office of Electricity (OE), and Hydrocarbons and Geothermal Office (HGEO) hereby announce interest in receiving applications from interdisciplinary teams addressing the [Genesis Mission National Science and Technology Challenges](#) to accelerate scientific discovery and research and development (R&D) workflows using novel artificial intelligence (AI) models and frameworks. By achieving AI advantage, these teams will advance the DOE's mission and ensure America's security and prosperity by addressing energy, environmental, and nuclear challenges through science and technology. Teams are encouraged to leverage the extensive scientific and data resources of the DOE/National Nuclear Security Administration (NNSA), the National Laboratories, U.S. industry, and academia. The resulting AI models and workflows, if successful, may be integrated into the American Science Cloud.

DOE is soliciting new **FY26 Phase I small team** and **Phase II large team applications** in the following topic areas: **advanced manufacturing, biotechnology, critical materials, nuclear fission, nuclear fusion, quantum information science, semiconductors and microelectronics, discovery science, and energy** (see specific focus areas in [Section III](#) Program Descriptions). This RFA will remain available to allow the recipients of FY26 Phase I awards to apply for larger team Phase II awards. In a few weeks, DOE plans to amend the RFA to clarify the LOI and application guidelines for FY26 Phase II awards. In FY27, DOE plans to amend the RFA or to issue an alternative funding opportunity to update the topic and focus areas to allow a second competition of Phase I small team applications and Phase II large team applications.

**Phase I:** Design and demonstrate a clear, tangible research workflow that incorporates AI with concrete evaluation of the potential for AI advantage. Success may include demonstrating increased predictive power or scientific insight from appropriately-curated data, more tightly coupling data and experiments to validate hypotheses, building new models and analyzing their impact on discovery speedup, identifying scaling metrics that show how performance improves with more data or computing resources, improving and speeding up experimental workflows (e.g., through automation or AI-informed parameters), or other proposed metrics that the team would like to be considered. To provide quantitative analysis of whether a proposed approach is on a trajectory toward a transformative scientific capability, justifying further investment. **Phase II:** Meritorious Phase I and new Phase II teams will pursue the promising directions identified during the first phase. DOE envisions a level of effort (including team size and budget) at 3 to 5 times the initial phase. Receipt of a Phase I award will not be a prerequisite for submitting a letter of interest and application for Phase II. If a team believes they have already achieved the goals of Phase I awards, they may apply directly for a Phase II award in FY26. However, it is anticipated that most FY26 awards will be Phase I. An amended RFA will be issued to provide updated instructions about the Phase II LOI and application.

**CHALLENGE AREAS FOR APPLICATION FORMATION:**

1. Reenvisioning Advanced Manufacturing and Industrial Productivity
2. Scaling the Biotechnology Revolution
3. Securing America's Critical Minerals Supply
4. Delivering Nuclear Energy that is Faster, Safer, Cheaper
5. Accelerating Delivery of Fusion Energy
6. Transforming Nuclear Restoration and Revitalization
7. Discovering Quantum Algorithms with AI
8. Realizing Quantum Systems for Discovery
9. Recentring Microelectronics in America
10. Securing U.S. Leadership in Data Centers
11. Achieving AI-Driven Autonomous Laboratories
12. Designing Materials with Predictable Functionality
13. Enhancing Particle Accelerators for Discovery
14. Unifying Physics from Quarks to the Cosmos
15. Predicting U.S. Water for Energy
16. Scaling the Grid to Power the American Economy
17. Unleashing Subsurface Strategic Energy Assets
18. HPC Code Curation, Translation, and Development for Accelerated Scientific
19. AI for Scientific Reasoning
20. Cybersecurity for AI-driven Science Workflows
21. Artificial Intelligence in Fluid Flow for Energy Components and Technologies

#### Funding Details:

- **Phase I:** \$500,000 to \$750,000 with the expected award project period of **9 months**.
- **Phase II:** Envisioned as 3 to 5 times the Phase I award with the expected award project period of **3 years**.

#### Eligible Applicants:

- DOE/NNSA National Laboratories are eligible to submit applications (either as a lead organization or as a team member in a multi-institutional team) under this RFA but may not be proposed as subrecipients under another organization's application.
- Non-DOE/NNSA FFRDCs are eligible to submit collaborative applications under this RFA but are not eligible to be proposed as subrecipients under another organization's application.
- Other Federal Agencies are eligible to submit collaborative applications under this RFA but are not eligible to be proposed as subrecipients under another organization's application. Instead, they must submit their own application as a team member in a multi-institutional team. If recommended for funding in a multi-institutional team, funding will be provided through an interagency agreement. Additional instructions for providing statutory authorization are found in Section IX of this RFA.

#### Cost Sharing: (See details in this RFA.)

- Unless otherwise specified for the topic, cost sharing is not required for basic and applied research awarded under this RFA, except for-profit entities. For-profit entities, whether prime recipients (lead organizations) or subrecipients (team members), are required to provide not less than 20% cost share for both basic and applied R&D activities and 50% of the total project costs for demonstration and commercial application tasks.

#### Limitations on Submissions: (See details in this RFA.)

- Applicant institutions are limited to **no more than one application as the lead institution per focus area for Phase I and Phase II applications combined**. Phase II applications must list a primary focus area but will have the option to list secondary focus areas. The primary focus area will be used for determining limitations on institutional submissions.
- There is no limitation to the number of applications for which the institution is not the lead in a multi-institution team using collaborative applications.
- **LIMITATIONS ON PI:** The PI on an application may also be listed as a senior or key personnel on an unlimited number of separate submissions but can be the lead PI on only one application. However, the PI on an awarded Phase I award may submit a Phase II proposal as part of the FY27 go/no-go decision process.

#### FORMAT

- The body text font of all main text must **not be smaller than 11 point**. Figures and references, if included, must fit within the page limit.
- No more than six lines of text within a vertical space of one inch.
- **Standard letter-size** (8.5-inch x 11-inch) paper with **1-inch margins** (top, bottom, left, and right).
- **These requirements apply to all uploaded sections of a proposal, including supplementary documentation.**

#### PRE-APPLICATION CHECKLIST

##### A. Preliminary Submissions

###### 1. Letter of Intent (LOI)

- **PHASE I AWARDS:** Not applicable for Phase I awards.
- **PHASE II AWARDS:** A LOI (from the lead institution of collaborative applications) is **strongly encouraged** and **should be submitted** by the date indicated on the cover of this RFA for FY26 Phase II awards. If the LOI is not submitted by the deadline, DOE may hold any subsequent Phase II application until FY27. A response from DOE will not be sent.

##### B. Application

**The instructions below apply only to Phase I applications.** An amendment to this RFA will provide instructions for Phase II applications.

###### 1. SF-424 (R&R) (Form) (Work with TAMU SRS)

###### 2. SF-424 Research and Related Other Project Information (Form)

- **PROJECT SUMMARY/ABSTRACT (1-page limit)** (FIELD 8 ON THE FORM; No specific character limit; See details in this RFA.).
- **PROJECT NARRATIVE (PN)** (FIELD 8 ON THE FORM; **5-page limit**; NO URLs; See details in this RFA)

- DOE TITLE PAGE (PART OF PN ATTACHED TO FIELD 8 ON THE FORM; not count toward the PN page limitation)

**The following organization of the Project Narrative is strongly encouraged:**

- **Buy America Requirement:** Within the first two (2) pages of the Project Narrative, include a short statement on whether the project will involve the construction, alteration, maintenance and/or repair of public infrastructure in the United States. See Section IX of this NOFO for applicable definitions and other information regarding Infrastructure Projects and the Buy America Requirement. (See Section IX of this NOFO for details.)
- **Background/Introduction** (approximately 1 page): Explain the importance and relevance of the proposed work and clearly articulate which aspect of the chosen challenge will be addressed and solved. Set the proposed research in perspective to other efforts in the field. Highlight novel or unique aspects of the proposed work. Cite relevant literature.
- **Project Objectives** (approximately 0.5 page): Provide a clear and concise statement of the specific objectives of the proposed project. Address how the objectives align with the chosen focus topic and lead to an AI advantage.

- **Proposed Research and Methods** (approximately 1.5 pages): Provide a clear research plan for a 9-month project and describe the proposed activities and methods. Include enough technical details to evaluate the impact of the proposed activity. For each activity, indicate the responsibility of the key investigator(s) and the associated budget. If the proposed application is building on an existing, currently funded DOE project, describe how the submitted application leverages that work and is distinct from the existing funding.
- **Milestones in the Nine Months** (approximately 1 page): Provide a list of clearly defined and measurable milestones of the project.
- **Data Sources and Models** (approximately 0.5 page): Describe which existing or new data sources will be used. Address your team's access to the data. If applicable, indicate which AI models or frameworks will be used in your proposed project. Do not include a description of computing resources and the means by which you will secure an allocation timed to your performance period; this should be done in Appendix 2.
- **Decision Gate Metrics** (approximately 0.5 page): Provide specific metrics that can be used for the evaluation of Phase I go/no go decision. DOE encourages the development of metrics to identify AI advantage. One such metric could include scaling behavior which shows increasing performance as additional data, computing, and/or other resources are applied. Quantitative statements enabling transformative science and engineering through AI are preferred.

**For Collaborative Applications Only:** Each institution in a multi-institutional team submitting collaborative applications **must submit an identical common narrative**, including all appendices. The common narrative must identify which tasks and activities will be performed by which of the institutions in the one-year budget period of the proposed project. The budget and the budget justification—which are unique to each institution—may refer to parts of the common narrative to further identify each institution's activities in the joint project. There should be no ambiguity about each institution's role and participation in the team.

- **Identification of Merit Reviewer Conflicts** (FIELD 12 ON THE FORM; no page limit) [DOE Template](#)

*Do not attach any of the requested appendices described below as files for Fields 9, 10, 11, and 12 on the SF-424 Research and Related Other Project Information form in Grants.gov. Follow the below instructions to include the information as appendices in the single PN file. These appendices will not count toward the PN's page limitation.* See detailed guidelines for each appendix in this RFA.

- **APPENDIX 1: BIBLIOGRAPHY & REFERENCES CITED** (no page limit & not count in the PN page limitation) (Each reference must include the names of all authors, the article and journal title, book title, volume number, page numbers, and year of publication. (DO NOT USE et al.))
- **APPENDIX 2: FACILITIES & OTHER RESOURCES** (no more than half a page)
- **APPENDIX 3: EQUIPMENT** (no more than half a page)
- **APPENDIX 4: DATA MANAGEMENT AND SHARING PLAN** (NOT required as an appendix to the PN but it will be required during award negotiation.)
- **APPENDIX 5: SYNERGISTIC ACTIVITIES (OPTIONAL; 1-page limit each of no more than five distinct examples)**
- **APPENDIX 6: TRANSPARENCY OF FOREIGN CONNECTIONS**
- **APPENDIX 7: OTHER ATTACHMENT** - Include the required *Letters of Commitment* and any *optional letters of collaboration* or access. If you need to elaborate on your responses to questions 1-6 on the "Other Project Information" document, please provide the Other Attachment information as an appendix to your Project Narrative.
  - **LETTERS OF COMMITMENT:** Letters of commitment from each institution participating as a team member **must** be appended to your Project Narrative and are **not** considered part of the Project Narrative's **page limit**.
  - **LETTERS OF COLLABORATION OR ACCESS:** Letters from collaborators or from institutions providing access to data, models, software, equipment and/or facilities **may** be appended to your Project Narrative and are **not** considered part of the Project Narrative's **page limit**.

### 3. Research and Related Senior/Key Person Profile (Expanded) (Form)

- **Biographical Sketches** (no page limit; DOE/NNSA SciENCv: [Link to SciENCv](#))
- **Current and Pending Support** (no page limit; DOE/NNSA SciENCv: [Link to SciENCv](#))

### 4. Research and Related Budget (Form)

- **BUDGET JUSTIFICATION (PDF) (FIELD L ON THE FORM)** (Consult with TAMU SRS for advice)

### 5. R&R Subaward Budget Attachment(S) Form (if applicable)

- **Subaward Budget Justification (if applicable)**

### 6. Project/Performance Site Locations (Form)

### 7. Disclosure of Lobbying Activities (SF-LLL) (Form)

## MERIT REVIEW CRITERIA

Applications will be subjected to merit review and will be evaluated against the following criteria, listed in descending order of importance:

### Criterion 1: Scientific and/or Technical Merit and Impact

#### For Fundamental Research Applications:

- What is the scientific innovation of the proposed research?

- How well does the proposed research achieve AI advantage?
- What is the likelihood of achieving valuable results?
- How might the results of the proposed work impact the direction, progress, and thinking in relevant scientific fields of research?
- How original and innovative is the proposed scientific approach, or concept?
- How well does the proposed work articulate its contribution to the related scientific community or mission application?

**For Applied Technology Development Applications:**

- What is the technical readiness level (TRL) of the proposed materials/technology, and how will the project advance it? (e.g., from TRL 3 to TRL 5)
- Does the application demonstrate a clear path toward improving key performance indicators (KPIs) for mission applications (e.g., cost reduction, improved safety, enhanced efficiency) compared to current state-of-the-art technologies?
- How well does the proposed technology align with the focus area specific objectives cited in the RFA?
- Are the proposed technical goals measurable, achievable, and impactful for real-world or commercial deployment?

**Criterion 2: Technical Approach, Methods, and Feasibility**

**For All Applications:**

- How logically sound, well justified, and appropriate is the proposed methodology for achieving the stated objectives?
- Does the proposed research employ innovative concepts or methods?
- Are the experimental design, theoretical models, and/or computational simulations robust and adequately detailed?
- Have potential challenges and risks been identified, and are the proposed mitigation strategies reasonable and comprehensive?
- Does the application provide a clear and realistic timeline for key project activities and milestones?

**For Applied Technology Development Applications:**

- Does the application address potential scalability issues?
- Are the proposed testing and validation protocols rigorous and representative of realistic operating conditions?
- Does the project incorporate considerations for environmental impact and safety relevant to mission application lifecycle?

**Criterion 3: Team, Resources, and Management**

**For All Applications:**

- How well qualified is the research team to carry out the proposed work?
- Does the project team possess the necessary expertise across all relevant disciplines to be successful?
- To what extent does the application demonstrate a clear, well-coordinated collaboration among partnering institutions, with appropriately balanced responsibilities, synergistic contributions, and clearly defined roles for each team member?
- Are the proposed facilities, equipment, and other resources, including access to data and AI models, adequate and appropriate for conducting the research/development?

**Criterion 4: Commercialization Potential for Energy Applications**

**For Applied Technology Development Applications:**

- Does the application articulate a credible strategy for technology transfer and/or commercialization beyond the project's duration?
- Are there identified market opportunities, and does the application present a preliminary techno-economic analysis or market assessment supporting the potential impact?
- What is the potential for the materials/technology to be adopted by industry, and what barriers to adoption are addressed?

**Criterion 5: Budget and Cost-Effectiveness**

**For All Applications:**

- Is the proposed budget reasonable, well-justified, and appropriate for the scope and scale of the proposed work?
- Does the cost share meet the RFA requirements and reflect a strong commitment from the applicant or team?
- Does the application demonstrate efficient use of resources and provide good value for the federal investment or foster collaboration with DOE/NNSA National Laboratories, academia, and relevant industries to leverage collective expertise for mission applications?