



To: Distribution List

From: Faculty Research Development Office (FRDO)  
Office of the Vice President for Research

Subject: Limited Competition: Department of Energy, FY2022 Artificial Intelligence Research for High Energy Physics, (DE-FOA-0002705)

Date: April 11, 2022

Dear UNM Researchers,

This FOA will invest in AI research applied to the HEP program following previously identified national research priorities and Basic Research Needs workshops conducted by SC.[1, 2, 3] The objectives are to support AI research that extends the scientific reach of existing HEP programs well beyond what is currently achievable including across frontiers and experiments; uses HEP to improve the understanding of the theoretical capabilities and limitations of fundamental AI; or develops shared public HEP datasets and computing environments for AI training and testing. The aim of this FOA is to consolidate existing parallel efforts and to foster new directions towards these objectives. Applications are sought that primarily focus on one of the following topic areas, though research may benefit secondary areas.

**AI for HEP** – The scientific objectives and priorities for the field recommended by the High Energy Physics Advisory Panel (HEPAP) are detailed in its long-range strategic Particle Physics Project Prioritization Plan (P5).[4] Applications are sought that are well aligned with the HEP program priorities. AI research that advances the P5 science drivers, or development of new AIbased technologies that expand paths of investigation for HEP beyond what was considered in the P5 report are encouraged. Ambitious applications of AI benefitting multiple HEP programs or experiments coherently and which are of broad interest are especially sought, as are innovative applications that can deliver significant advances to HEP experimental reach or theoretical understanding.

**HEP for AI** – This FOA also seeks to support research that makes use of unique aspects of HEP to improve the understanding of the theoretical capabilities and limitations of fundamental AI. Research into robust scientific ML, data intensive ML, ML-enhanced Modeling and Simulation, Uncertainty Quantification, and Physics Informed ML that exploits HEP theoretical understanding, experimental data, or simulations to provide insight into general AI/ML methods are encouraged. An example of a possible research topic in this area would be evaluation of various Physics Informed ML techniques compared to training more traditional networks.

**HEP AI Ecosystem** – Proposed work toward production of open datasets, collaboration with industrial or national laboratory partners, as well as development of “ecosystem” software allowing for straightforward training and deployment of models is equally encouraged. Applications that address democratic access among all-sized institutions to computing resources and continued development and retention of the

workforce for the products being developed are especially welcome. Examples of possible topics in this area would be curating HEP datasets for public access, or integration of modern ML software into standard HEP tools.

Applications for work currently supported by DOE or other funding entities are outside the scope of this FOA. Applications that are not in direct support of HEP research (e.g., conferences, experimental operations, conceptual research and development (R&D), design, or fabrication directed towards a specific project, etc.) may not be submitted in response to this FOA.

UNM is eligible to lead single-institution “seed” awards. Multi-institution collaborations must be led by a DOE/National Nuclear Security Administration (NNSA) National Lab.

For single-institution seed applications it is anticipated that award sizes will range from \$50,000 per year to \$100,000 per year, typically less than \$75,000 per year, with a median award size between \$50,000 per year and \$75,000 per year. **A letter of intent is highly encouraged and is due April 21, 2022 at 3:00 PM with final applications due May 24, 2022.** This is the link for full details:

<https://apply07.grants.gov/apply/opportunities/instructions/PKG00272731-instructions.pdf>

**This is a limited competition.** Each institution is limited to no more than four (4) letters of intent and four (4) applications. *Please submit a **Statement of Interest** by **NOON on Thursday, April 14, 2022*** via UNM’s [InfoReady Review portal](#). The statement of interest must include a clear and concise description of the objectives and technical approach of the proposed research.

Should you have any questions please feel free to contact us at [limited@unm.edu](mailto:limited@unm.edu).

*If you are affiliated with HSC, please contact Corey Ford ([CFord@salud.unm.edu](mailto:CFord@salud.unm.edu)) or Cassandra Misener ([CMisener@salud.unm.edu](mailto:CMisener@salud.unm.edu)) for more information.*