



AI-M SEED GRANTS

Advancing Extreme Materials using Artificial Intelligence Approaches

The Hopkins Extreme Materials Institute (HEMI) is pleased to announce a funding opportunity to support seed grants in the research area of Advancing Extreme Materials using Artificial Intelligence Approaches.

This opportunity will fund research activities that advance the understanding of materials and materials design for extreme environments through artificial intelligence/machine learning/data science. Directions of interest include the development of AI methods that can be applied to mechanics and materials, the use of existing AI tools to advance material design for extreme environments, and the conceptualization and development of AI driven integrations of processing, characterization, and modeling of materials.

The Materials in Extreme Dynamic Environments (MEDE) program, the primary source of funds, seeks to advance the use of AI tools for material design and development. However, MEDE-specific material systems need not be examined in order to advance such tools.

Eligibility

All faculty and researchers at the Johns Hopkins University (as well as Applied Physics Laboratory Staff) who can serve as Principal Investigators (PIs) and Co-Investigators (Co-PIs) are eligible to apply. A co-investigator may be from another university/institution, but all funded postdocs and students must be at JHU.

Programmatic

- It is anticipated that between 3 and 4 proposals will be awarded, totaling approximately \$1 million.
- This seed grant opportunity complements the 2020 JHU Discovery Awards call, emphasizing research related to artificial intelligence.
- HEMI will coordinate with JHURA and the Vice-Provost's office to avoid funding of the same proposal by multiple sources.

Budget Guidance

Since funding for these seed grants is linked to the MEDE program, the following specific budget guidance is provided:

- Funding is projected to cover two consecutive years.
- Assume a period of performance of summer 2020 to summer 2022.
- Annual budgets of up to \$150,000 are typical, but larger budgets will also be considered.
- Collaborative efforts are highly encouraged.
- Funding of shared postdoc(s) is highly encouraged.



- Due to the importance of faculty/researcher involvement, tenured/tenure track faculty can include up to one month of effort per year. Research faculty can include multiple months each year. This applies to both PI and Co-PIs.
- Utilize federally negotiated fringe rates.
- Standard non-salary items such as travel, materials, and supplies may be included.
- Utilize an F&A rate of 62% (based on the MEDE program's negotiated F&A rate)
- PIs are welcome to use their department/center/institute budget templates. The budget should be broken out by year and include a standard budget justification.
- Lisa Eklund and Andrew Proulx are available to assist HEMI Fellows in preparing the budget and budget justification.

Proposal Format

- Title Page – Include proposal title, investigators, their departments and e-mail addresses.
- Narrative – Not to exceed 5 pages. Must include the following:
 - Statement of the problem or area of investigation.
 - Project Goals and Objectives – Include the research objectives and/or techniques or tools that will be developed.
 - Accomplishments – Describe what accomplishments your project will have achieved at the end of: a) year one, and b) year two.
 - Future Funding and Goals – State how this project will help the proposing team attract new or additional external funding following the HEMI Seed Grant project phase. State which funding agencies and programs will be approached with future proposals.
 - Impact – Describe how this project will impact HEMI and/or the broader JHU research community. Proposals which do not include at least one current HEMI fellow should discuss how they will engage with the Institute if the proposal is funded.
- Budget and Budget Justification – see budget guidance section.
- Curriculum Vitae (2 pages, standard NSF format, collaborator and other affiliation information section is not required).

Evaluation Criteria

Successful AI-M seed grant proposals are likely to:

1. Advance the field in mechanics and materials.
2. Lead to a proposal through HEMI that leads to a sponsored research grant.
3. Develop or expand capability at JHU and within HEMI in the relevant area.
4. Be clear, coherent, and concise.

Award Recipient Expectations

- Complete research within the two year period of performance. Financial expenditures will be tracked monthly. If the project falls behind on spending, the



- HEMI Director reserves the right to reduce the initial award to ensure proper execution of funding provided. No-cost extensions will not be offered.
- Submit a proposal for external research funding through HEMI within one year of completion of the project.
 - Include the MEDE acknowledgment statement in publications and presentations that are a result of this award.
 - If needed, the selection committee may ask for additional information from the PI.

Deadlines and Evaluation

March 6, 2020: A brief Notice of Intent identifying likely members of the team (email to Professor KT Ramesh, ramesh@jhu.edu).

5 p.m. Monday, March 23, 2020: Proposal Deadline. Please email the proposal as a single PDF document to Dr. Victor Nakano (vnakano@jhu.edu). The review committee may seek budget adjustments before making final decisions. The principal investigator should ensure the proposal contains all required elements and is clearly written.

- For technical questions, please contact Professor KT Ramesh (ramesh@jhu.edu).
- For administrative questions, please contact Dr. Victor Nakano (vnakano@jhu.edu).