



## Research & Educational Seed Grant Program

# 2024 – 2025 Call for Proposals Key Dates

Request for Proposals Issued: April 3, 2024

**Proposals Due: May 31, 2024, 5:00 PM EDT**

Awards Announced\*: July 15, 2024

Funded Projects Start Date\*: August 1, 2024

*\* anticipated date, subject to change*



The goal of the CAMM Seed Grant Program is to bring new ideas and people into the Center. Projects can either align with current IRG research themes or form the foundation for new distinct directions.

### **CAMM's Vision**

Next-generation materials and manufacturing (NGMM) are placing demands beyond current state-of-the-art. The UTK-MRSEC, the Center for Advanced Materials & Manufacturing (CAMM), was funded in 2023 to address these challenges. CAMM's vision is to become a world-leading center for collaborative discovery, creating revolutionary quantum materials and advancing materials for new extremes. Our interdisciplinary education programs are designed to prepare diverse cohorts of future researchers and entrepreneurs to ensure continued US leadership in NGMM. Our dedication to innovation helps to ensure discoveries are translated into new products, processes, and services in advanced energy, national security, advanced computing and communications, transportation, and many more. CAMM enjoys a unique strategic partnership with Oak Ridge National Laboratory (ORNL) that serves to strengthen collaborations among the NSF- and DOE-funded materials science and engineering communities.

### ***IRG1 - Taming the Complexity of Quantum Materials with Artificial Intelligence***

Applying AI to quantum magnetic materials and engineered quantum systems to support the rational design of quantum materials with applications ranging from energy harvesting and low power electronics to quantum computing and novel sensing. Specifically, we will use artificial intelligence (AI) and its subset machine learning (ML) to learn and refine model Hamiltonians for quantum materials using experimental data; uncover guiding materials principles responsible for desired quantum functionalities; optimize and automate costly experimental and theoretical protocols for quantum materials research; and, ultimately connect microscopic material properties with emergent quantum phenomena. Success will be assessed through materials advances disseminated via an AI computational user facility where data sets, trained materials AI models, and autosteering protocols will be made available to the broad materials science and engineering community.

### ***IRG2 Advancing Next-Generation Alloys and Ceramics for Extremes***

Exploring the effects of extreme conditions on the phase stability, atomic structure, and properties of high-performance structural materials, and elucidating the materials paradigm for these novel systems. A broad spectrum of applications will be considered, ranging from nuclear fusion to hypersonic vehicles. Specifically, we will perform fundamental synthesis-structure-property studies to identify design rules for a new sector of high-performance alloy and ceramic systems with improved stability in extreme environments relative to present-day materials. Materials will be designed, fabricated, and exposed to extreme quasistatic or dynamic conditions. Modeling at multiple length scales, incorporating AI, will be used to: understand stability, physical properties, and deformation behavior of materials under extreme conditions and guide synthesis and property testing. Experimental and modeling strategies will be interactively coupled and guided by AI to



accelerate discovery of materials behavior. Successful outcomes will be new materials and design principles for extreme conditions.

## **Program Description**

**Call for Proposals - open to all faculty members and UT-ORII faculty within the University of Tennessee materials research & education community.** The call for proposals has three funding tiers designed to encourage new lines of inquiry, engage UT faculty to partner with faculty, postdoctoral trainees, and students from underrepresented groups, and to create UT partnerships with national laboratories or industrial partners.

**The three funding tiers of the CAMM Seed Grant Program offered this cycle are:**

### **1. EXPAND**

EXPAND Grants provide up to \$50,000/year per award in direct costs with the goal of establishing new lines of inquiry either within the existing Interdisciplinary Research Groups (IRGs) or forming the basis for future IRGs within CAMM the National Science Foundation (NSF) supported UTK Materials Research Science and Engineering Center (MRSEC). Special emphasis will be given to applications from early career researchers.

### **2. INCLUDE**

INCLUDE Grants provide up to \$50,000/year per award in direct costs and require one UT PI with up to two Co-PIs from a Historically Black College and University (HBCU) or Minority Serving Institute (MSI), with the goal of engaging faculty, postdoctoral trainees, or students from underrepresented groups in CAMM by forming multidisciplinary teams. INCLUDE Grants are intended for positioning the team to compete effectively for future external funding opportunities.

### **3. TRANSLATE**

TRANSLATE Grants provide up to \$50,000/year per award in direct costs, and require one UT PI, and with up to two Co-PIs from industry and/or a national laboratory. The goal of the TRANSLATE Grant tier is to build reciprocal, translational partnerships with industry and/or national lab collaborators and position the UT team with the opportunity to engage in multidisciplinary research for solving real-world problems.

The following pages describe the three tiers of seed funding opportunities and provide details on how to apply. Please visit <https://camm.utk.edu/seed>, for additional information and updates related to this year's seed grant call for proposals.



## Description of the Three Funding Tiers

### 1. EXPAND

EXPAND Grants seek to stimulate interdisciplinary research that broadens the scope of the CAMM. The goal is to develop full-scale IRGs to be incorporated into the Center. Technical overlap of the proposed research with the current CAMM IRGs is not required. However, synergy with the mission of CAMM is preferred (for example through shared facilities, techniques, theory/modeling, materials, etc. see Figure 1). These proposals should fall within the program scope of the Division of Materials Research at NSF. We invite proposers to check out the CAMM website ([camm.utk.edu](http://camm.utk.edu)) and to communicate with CAMM representatives to identify competitive topics. These grants will support small interdisciplinary groups of one PI and two or more Co-PIs per team. Each EXPAND team is expected to form the core membership of a future IRG. Proposed projects should be broad and interdisciplinary while maintaining a focus on a central theme to meet the requirements of a full IRG.

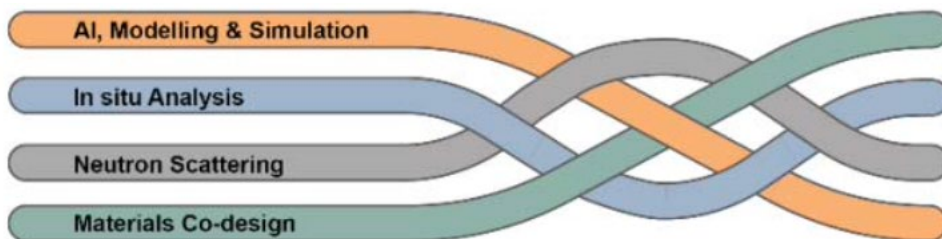


Figure 1. *Common threads and high-level activities braid expertise in CAMM for the exploration of next generation materials and manufacturing techniques.*

Although not required for EXPAND proposals, a strong synergy between experimental and use of AI/ML components is essential for full IRGs. Proposers are encouraged to review the most recent MRSEC solicitation from NSF for further information on what is expected of a full IRG, the specification that the “whole be greater than the sum of the parts” at: <https://new.nsf.gov/funding/opportunities/materials-research-science-engineering-centers>

Awards will be up to \$50,000 in direct costs per year. The initial funding period is one year, but a successful EXPAND Grant team may apply for renewal in next year’s open competition of the CAMM Seed Grant Program. Funded EXPAND Grants teams are expected to participate actively in further team building and CAMM activities.

Contact Information:

Amber White ([amberw@utk.edu](mailto:amberw@utk.edu)) or Professor Alan Tennant ([dtennant@utk.edu](mailto:dtennant@utk.edu)) with any questions.



## **2. INCLUDE**

INCLUDE Grants seek to build partnerships between UTK and HBCUs and MSIs resulting in new interdisciplinary collaborations with potential to have broad impact and to be able pursue future funding opportunities. These grants are focused on building a multi-institutional team and require one UT PI with one or two Co-PIs from a HBCU or MSI. INCLUDE Grants are intended for positioning the team to compete effectively for future external funding opportunities.

### [Minority Serving Institutions Directory](#)

Awards will be up to \$50,000 in direct costs per grant per year. The initial funding period is one year, but a successful INCLUDE Grant team may apply for renewal in next year's open competition of the CAMM Seed Grant Program.

Contact Information:

Please contact Amber White ([amberw@utk.edu](mailto:amberw@utk.edu)) or Professor Claudia Rawn ([crawn@utk.edu](mailto:crawn@utk.edu)) with any questions.

## **3. TRANSLATE**

TRANSLATE Grants seek to build reciprocal, translational partnerships with industry and/or national lab collaborators offer faculty the opportunity to engage in multidisciplinary research for solving real-world problems. These grants require one UT PI with one or two Co-PIs from industry or a national laboratory.

Awards will be up to \$50,000 in direct costs per grant per year. The initial funding period is one year, but a successful TRANSLATE Grant team may apply for renewal in next year's open competition of the CAMM Seed Grant Program.

Contact Information:

Please contact Amber White ([amberw@utk.edu](mailto:amberw@utk.edu)), Professor Adrian Del Maestro ([Adrian.DelMaestro@utk.edu](mailto:Adrian.DelMaestro@utk.edu)), or Professor Kate Page ([kpage10@utk.edu](mailto:kpage10@utk.edu)) with any questions.



# How to Apply

## Eligibility

1. An applicant may serve as PI on only **one** proposal in response to this Call for Proposals. The PI must hold a faculty-level appointment at UT or UT-ORII. The CAMM Leadership and Seed Board members are **NOT** eligible to submit as PIs. **All proposed research must be clearly distinct from ongoing externally or internally funded research.**
2. Currently funded PIs with unspent funds are not eligible to apply to this call.

## Proposal Submission

All proposals are due by **Friday, May 31, 2024, at 5:00 PM EDT**. Submit your proposal as a **single PDF file** via the submission forms on <https://camm.utk.edu/seed/expand>; <https://camm.utk.edu/seed/include>; or <https://camm.utk.edu/seed/translate>.

**Proposals that do not meet the submission deadline will not be considered.**

## Proposal Preparation Instructions

Use a minimum 11-point font size, single line-spacing, and 1" margins throughout

1. **Cover Page** (1 page maximum) including: identification of the Funding Tier (EXPAND, INCLUDE, or TRANSLATE); proposal title; names, titles, and departmental affiliations of PI, Co-PIs and collaborators; contact information for the PI only (mailing address, email, phone, and fax numbers); proposal abstract (200 words maximum)
2. **Project Description** (3 pages maximum) including:
  - a. Objectives of the proposed research project
  - b. Description and scope of research
  - c. Work plan and methodology
  - d. Expected outcomes
  - e. Research facilities that may be used to conduct the research
3. For **EXPAND Research Grant** proposals
  - a. A coherent management plan detailing how the project will be executed.
  - b. Plan for expansion to a full IRG
4. For **INCLUDE and TRANSLATE Research Grant** proposals
  - a. Expertise of the team and synergy among team members to enable research of an inter-institutional/multi-disciplinarily team
  - b. A coherent management plan detailing how the project will be executed as a team.
  - c. A list of targeted future funding opportunities and a description of how the team will be able to compete effectively for those opportunities if the proposed research objectives are met.



5. **References Cited** (no page limit)
6. **Budget Information** (1 page maximum): Provide a detailed budget for the proposed and a brief budget justification.
7. **SciENCv** – SciENCv for the PI (2 pages)
8. **Quad Chart** – Download at <https://camm.utk.edu/seed/expand>; <https://camm.utk.edu/seed/include>; or <https://camm.utk.edu/seed/translate>.

**Proposals longer than the stated page limits and/or omitting information requested above will not be reviewed.**

### **Budget Restrictions**

Seed grants are intended to primarily support student and/or postdoctoral researcher salaries and benefits, tuition, materials and supplies, and instrument user fees. INCLUDE Grants should allow some budget for travel between institutions.

The following expenses are **NOT** allowed: equipment, faculty salaries and benefits; computers, food, and entertainment.

### **Terms and Conditions**

All selected proposals are subject to terms and conditions, including reporting requirements, that will be specified when the grants are awarded.

- All publications that result from seed funding must appropriately acknowledge CAMM and NSF support as demonstrated below:  
*“This work was supported in part by partially supported by the National Science Foundation Materials Research Science and Engineering Center program through the UT Knoxville Center for Advanced Materials and Manufacturing (DMR-2309083).”*
- PIs are required to submit reports consisting of one page of text and one “highlight” slide in April of the year following funding for inclusion in annual report. The exact deadline and requirements will be communicated to PIs of the awarded seed grants.
- All purchases, travel, and HR appointments will be conducted in the home departments of the investigators.



## **Proposal Review Process**

### **CAMM Seed Board**

- Alan Tennant, Seed Chair, CAMM Director, Professor, Dept. Physics and Astronomy
- Claudia Rawn, CAMM Deputy Director and Director of Education, Diversity, Outreach, and Recruitment, Professor, Dept. Materials Science and Engineering
- David Mandrus, IRG 1 Representative, Professor, Dept. Materials Science and Engineering
- Tim Truster, IRG 2 Representative, Associate. Professor, Dept. Civil and Environmental Engineering

Each complete proposal will be reviewed internally by the CAMM Seed Board and external subject matter reviewers. The CAMM Seed Board will make recommendations to CAMM's External Scientific Advisory Board (<https://camm.utk.edu/esab>). At the time of the award notification, PI(s) will receive an anonymous copy of the reviews.

### **Review Criteria**

- Intellectual merit of proposed research activity, including originality and potential contribution to science, technology, and education
- Potential to seed transformative advances involving materials-allied research
- Clearly distinct from ongoing externally or internally funded research, including recent CAMM Seed Grant Program funding (these are not meant to be continuation grants)
- Potential to positively impact Investigators' career trajectory
- Potential for the proposed research to be funded through external funding mechanisms

### **Additional Review Criterion (EXPAND Grants)**

- Plan for development into a future IRG

### **Additional Review Criteria (INCLUDE and TRANSLATE Grants)**

- Evidence of team synergy
- Potential for winning external funding

### **Post-Award Spend and Reporting Compliance**

Teams will have 12 months from the date of fund transfer (*anticipated* August 1, 2024 – July 31, 2025) to expend all funds. Any remaining funds will be reallocated by CAMM to be used towards the next fiscal year's seed funding cycle.





## Extensions

If you cannot complete your project aims within the specified project period, CAMM will allow no more than **one (1) no-cost extension (NCE) request** to extend your project. The NCE is **not guaranteed**. An NCE extends the original project period, allowing the completion of project aims without additional funds being provided. Extensions will not be granted for the sole purpose of spending the remaining funds. Requests containing award information and detailed justification must be emailed to Amber White ([amberw@utk.edu](mailto:amberw@utk.edu)), no later than June 1, 2025, 60 days prior to the end of the award.

## Reporting

- By June 1, 2025, 60 days prior to the end of the award, teams must **update the PPT Quad Chart** Included in their original proposal with a new section to answer, “*So What? / Broader Impacts*”. Do not include any confidential or proprietary information.
- Teams are expected to provide data on any associated awards/funding, publications, professional awards, and invited talks that have fully or partially resulted from this award. Papers must cite CAMM and NSF support as follows: *“This work was supported in part by partially supported by the National Science Foundation Materials Research Science and Engineering Center program through the UT Knoxville Center for Advanced Materials and Manufacturing (DMR-2309083).”*

**Please contact Amber White ([amberw@utk.edu](mailto:amberw@utk.edu)) or Professor Claudia Rawn ([crawn@utk.edu](mailto:crawn@utk.edu)) if you have any questions or need assistance with your proposal submission.**