2023 Catalyst Grant Informational Session

Michigan Institute for Computational Discovery & Engineering

MICDE
Mission:
Advance new paradigms and applications of computational science to enable scientific discoveries and engineering innovations.

Vision:
Define a future in which computations are a generator of knowledge and provide direct solutions to the most pressing questions of the time.

- 160+ Affiliated Faculty
- 37 Departments: CoE, LSA, Medicine
- 2 Educational Programs
  - Ph.D. in Scientific Computing
  - Graduate Certificate in CDE
- 2 Research Centers
- Catalyst Grants
- PhD Fellowships
- Events:
  - Seminar series
  - Annual Symposium
  - Faculty Workshops
Education And Management Committee

Victoria Booth (Mathematics And Anesthesiology)
Sherif El-Tawil (Civil And Environmental Engineering)
C. Alberto Figueroa (Biomedical Engineering And Surgery)
Krishna Garikipati (Mechanical Engineering And Mathematics)
Emmanouil Kioupakis (Materials Science And Engineering)
Brendan Kochunas (Nuclear Engineering And Radiological Sciences)
Kathryn Luker (Radiology)
Walter Mebane (Political Science)
Quentin Stout (Electrical Engineering And Computer Science, Cse)
Monica Valluri (Astronomy)
Paul Zimmerman (Chemistry)
MICDE: Strategic Thrusts

- Scientific Machine Learning
- Computational Linear Algebra & Numerical Analysis
- High-Dimensional Inference & Optimization
- Hardware/Software-Centric Computing Paradigms
- Algorithms for Quantum Computing
- Formal Verification for Computational Science

- Digitalization
- Physics-based Medical Applications
- National Security
- Energy & Climate Sciences
- Neuroscience & Neuroengineering
- Nanoscale Physics, Chemistry & Engineering
Catalyst Grants: Description

• High impact, innovative research projects in computational science
  • Combine elements of mathematics, computer science, and cyberinfrastructure
  • Potential to attract large-scale external support

• Of special significance to the 2023 request for proposals are:
  • Emerging paradigms in computing (neuromorphic computing, quantum computing, FPGA computing, etc.)
  • Applications in emerging areas (neuroscience, ecology, evolutionary biology, human-made complex systems, mobility, social sciences etc.)
  • Nuclear fusion: energy and astrophysics
  • Intelligent programming methods for scientific computing
  • Hardware/software codesign for scientific computing

• Other aspects of computational science related to MICDE’s strategic thrusts
Catalyst Grants: Description

• High impact, innovative research projects in computational science
  • Combine elements of mathematics, computer science, and cyberinfrastructure
  • Computational science related to MICDE’s strategic thrusts
  • Potential to attract large-scale external support

• Generic big data problems that do not fundamentally advance computational science algorithms are not suitable for MICDE Catalyst Grants.
Catalyst Grants: Review Criteria

• Novel work, not an incremental extension of existing work
• Likelihood of success
• Plan for specific external funding agencies or foundations to be approached as an outcome of the project
• *For full proposals*: a plan to leverage the infrastructure of Advanced Research Computing (ARC) at University of Michigan for external funding
Catalyst Grants: Budget and Justification

• Up to $100,000
• Postdocs and graduate students’ salary ~80%
• Travel, ARC resources
• No indirect cost or cost-sharing
Catalyst Grants: How to Apply

• Who
  • PI/co-PI must be University of Michigan faculty
  • Collaborative proposals are encouraged

• Pre-proposal
  • 2-pages PDF that includes:
    • Project description
    • Plans for follow up funding
    • Work plan for all personnel
    • Budget justification
  • References (no page limit)
  • Submit application in micde.infoready4.com by May 24, 2023
Catalyst Grants: How to Apply

• Full proposal – by invitation
  • 6-pages PDF that includes:
    • Project description
    • Plans for follow up funding
    • Work plan for all personnel
  • References (no page limit)
  • 2-page NSF or NIH style CV for PI and co-Pis
  • A detailed budget and budget justification – template will be provided
Catalyst Grants: Review Process

• 3-4 U-M members per review panel
• PIs should suggest 2-3 reviewers
• Review panels will have a template with evaluation categories
• All proposals will get feedback, regardless of outcome
• Will aim to use same pool of reviewers for preliminary and full proposal projects
Catalyst Grants: FAQ

• Should the proposal include mathematics, computer science, and/or cyberinfrastructure collaborators?
  • Such collaborations are encouraged. Cyberinfrastructure collaborations could come by engaging closely with ARC-TS or CSCAR.

• Must projects have new developments in computational methods, or are innovative applications of existing computational methods also acceptable?
  • Innovative applications of existing computational methods are also sought.

• Can a proposal have a single PI?
  • Yes.
Catalyst Grants: FAQ

• Should PIs/co-PIs be MICDE affiliated faculty?
  • No, affiliation to MICDE is not required. PIs that are not affiliated with MICDE will be asked to fill out a form to become affiliated with MICDE.

• Will other research areas not listed be considered?
  • Yes! Every research project within the MICDE’s strategic thrusts will be considered.

• If my project is chosen, is there a deadline for the start of the project?
  • All projects should start by September 1, 2023 to give PIs a chance to recruit students/postdocs.
Catalyst Grants: FAQ

• Does the $100,000 have to be used up in 1 year, or could it be extended?
  • Extensions will be considered, but PIs are strongly encouraged to have a plan to use all the money in 1 year.

• Can any funds be used for lab analyses?
  • Data analyses is OK, but at this time in-house experiments cannot be funded through this grant.

• Does MICDE want software to be an output of the project?
  • No, software is not expected as an output of the project, but it could be a component of the project.
Catalyst Grants: additional information

For more details please contact:
Vancho Kocevski at vancho@umich.edu
MICDE office at micde-contact@umich.edu

To learn about our previously funded projects, visit:
micde.umich.edu/catalyst