



## Call for Seed Proposals

**Funded by the Advanced Materials Industrial Consortium (AMIC)**

**Date for submission of proposals: Monday, October 31, 2016**

**Awards announced: Monday, November 21, 2016**

### ***The UW AMIC***

The University of Wisconsin Advanced Materials Industrial Consortium (AMIC) is a Wisconsin Materials Research Science and Engineering Center (MRSEC) -led group of industrial and academic members created to leverage the broad spectrum of university- and industry-based materials science resources and capabilities in the region. AMIC does this by promoting synergies between materials researchers and technologists, facilitating access to personnel and infrastructure to tackle important materials-related challenges, enhancing student experiences with industry for professional development, and facilitating recruitment of a strong and diverse regional network of industry-based materials researchers.

### ***Benefits of Participation***

This Seed Program is intended to be an opportunity for graduate students, postdocs, and/or undergraduate students to gain experience working on projects of interest to industry. Participants will get an inside look at problems/challenges facing industry, and develop solutions. Participants will also gain experience in funded research from proposal development to final reporting.

### ***Scope of Seed Projects***

The UW AMIC is soliciting proposals for short-term, collaborative research projects that address a current or anticipated need in advanced materials and/or manufacturing. Proposals may either address an industry-solicited challenge area (see attached list) or a self-conceived project. Projects will be awarded 5-9 month project periods beginning December 1, 2016, with the potential for renewal. Projects will be conducted by a small team of UW-Madison graduate students, postdocs, and/or undergraduate students, and will be advised by a UW-Madison faculty member. Typically, projects will support a small amount of effort per student / postdoc per year of your existing stipend, as well as supplies and equipment, and up to \$2,000 of discretionary funding for the faculty advisor. All awarded projects will include reporting of research results at the end of the project period.

### ***Seed Proposals***

Seed proposals must include a description of the challenge or industry need (1 page), and a plan to address that need / challenge (2 pages), a description of anticipated project outcomes (1/2 page), a budget and budget justification (budget template attached), and an NSF-formatted bio-sketch for each participant (bio-sketch template attached). Proposals must be submitted by the end of business (EoB), Monday, October 31, 2016 to Erin Gill ([emgill@wisc.edu](mailto:emgill@wisc.edu)).

### ***Review Process***

Proposals will be reviewed and evaluated based on the NSF criteria of: 1) intellectual merit, and 2) broader impacts. Intellectual merit addresses the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields, and broader impacts addresses the potential for the proposed activity to benefit society or advance desired societal outcomes. Awards will be announced on Monday, November 21, 2016.

### More Information

Further information about the AMIC is available at [www.uwamic.wisc.edu](http://www.uwamic.wisc.edu). Applicants are strongly encouraged to contact AMIC Co-Directors Felix Lu ([fplu@wisc.edu](mailto:fplu@wisc.edu)) and Erin Gill ([emgill@wisc.edu](mailto:emgill@wisc.edu)) to discuss potential projects.

### Seed Budget Template

#### Budget for 5-9 month project periods beginning December 1, 2016

	<b>Personnel</b>	
1	Graduate student-1	
2	Graduate student-2	
3	Graduate student-3	
4	Fringe benefits (23.5%)	
5	<b>Total Salaries and Benefits</b>	
	<b>Other Direct Costs</b>	
6	Materials and Supplies	
7	Tuition remission	
8	Other	
9	<b>Total Other Direct Costs</b>	
10	<b>Total Direct Costs [5+9]</b>	
11	<b>Modified Total Direct Costs [10-7]</b>	
12	<b>Indirect Costs (10% MTDC)</b>	
	<b>Total Funds Requested [10+12]</b>	

#### Budget Justification

##### Personnel

Funds are requested to support three graduate students for X month(s) of effort over the project period (FY2017 Research Assistant annual salary, 100% appt. = \$44,162). Graduate students \_\_\_\_ will work with Professor \_\_\_\_ on \_\_\_\_\_. Fringe benefits are calculated using the FY2017 rate for research assistants (23.5%). [Note: Postdoc salary varies; FY2017 fringe rate for research associates is 24.7% and FY2017 fringe rate for Post-Doc Fellows is 17.4%, see <https://www.rsp.wisc.edu/rates/index.html> for full listing of FY2017 fringe rates]

##### Materials and Supplies

Funds are requested for starting materials, reagents and solvents, and chemicals for electrochemical synthesis and characterization (\$X).

##### Tuition Remission

Tuition remission is requested in the amount corresponding to the monthly rate (\$12,000/9 months) per student, for a full time (33.33% appt. or greater) graduate student.

##### Other

Funds are requested to be used at the discretion of the faculty advisor (\$X).

##### Indirect Costs

An F&A rate of 10% is applied to Modified Total Direct Costs (MTDC). The MTDC is the total direct costs less tuition remission.

## NSF Biographical Sketch Template for NSF 16-001

[Investigator or Senior Personnel Name]

[In Arial 10 or Times New Roman 11 point font; 2 Pages Maximum]

### (a) Professional Preparation

Undergraduate Institution(s)	Location	Major	Degree & Year
Graduate Institution(s)	Location	Major	Degree & Year
Postdoctoral Institution(s)	Location	Area	Inclusive Dates (years)

### (b) Appointments

A list, in reverse chronological order, of all the individual's academic/professional appointments beginning with the current appointment.

### (c) Products

A list of: (i) up to five products most closely related to the proposed project; and (ii) up to five other significant products, whether or not related to the proposed project. Acceptable products must be citable and accessible including but not limited to publications, data sets, software, patents, and copyrights. Unacceptable products are unpublished documents not yet submitted for publication, invited lectures, and additional lists of products. Only the list of ten will be used in the review of the proposal.

Each product must include full citation information including (where applicable and practicable) names of all authors, date of publication or release, title, title of enclosing work such as journal or book, volume, issue, pages, website and URL or other Persistent Identifier.

If only publications are included, the heading "Publications" may be used for this section of the Biographical Sketch.

### (d) Synergistic Activities

- A list of up to five examples that demonstrate the broader impact of the individual's professional and scholarly activities that focuses on the integration and transfer of knowledge as well as its creation. Examples could include, among others: innovations in teaching and training (e.g., development of curricular materials and pedagogical methods); contributions to the science of learning; development and/or refinement of research tools; computation methodologies, and algorithms for problem-solving; development of databases to support research and education; broadening the participation of groups underrepresented in STEM; and service to the scientific and engineering community outside of the individual's immediate organization.

## Industry-Solicited Projects

### Project 1:

Electrochromic (EC) displays have been underutilized as a display technology, mainly due to their relatively slow switching times (hundreds of milliseconds) and monochromic output. They are, however, low power, low cost, easy to manufacture and environmentally friendly and suitable for niche applications (e.g. low cost wearable IoT device). Some device design, process control and characterization can make these devices even more useful by increasing the optical output intensity and understanding how humidity degrades the performance and lifetime of the device.

This project may encompass the following stages:

1. Understand the physics of EC elements and displays,
2. Characterize the quality of the EC display as a function of driving power or other related metric
3. Determine how humidity affects the quality and lifetime of the devices
4. Determine mitigation schemes for humidity failure modes and present results.

### Project 2:

Microstructural implications of rheologically-driven melt instabilities and draw resonances produced by processing highly-filled polyolefin compositions with annular dies during tube extrusion

Ideas for research include studying CaCO<sub>3</sub> loaded (30-60% by wt.) polyethylene-co-octene materials extruded into tubes. It is anticipated that CaCO<sub>3</sub>, is an inexpensive chalk filler, will affect various properties of the extruded filaments.

Some areas that can be studied in this project are:

- Critical loading level of pigment required to see melt instabilities during extrusion,
- Understanding annular die geometries and draw rates leading to draw resonance,
- Correlating the instabilities to local microstructural changes induced by the shear forces during processing, and
- Finding suitable process parameter windows to turn the effect on and off.