

PROJECT ELEMENTS

- **New REU Site:** *Materials Working Group – Depth & Breadth of Materials Research*
- **PI:** Giselle Thibaudeau, Director Electron Microscope Center
- **coPI:** Adrienne Minerick, Assistant Professor of Chemical Engineering
- **Submitting organization:** Mississippi State University
- **Location(s):** Mississippi State University
- **Main field(s) and sub-field(s) of the research:** Materials Science and Engineering, Chemical Engineering, Mechanical Engineering, Chemistry, Physics
- **No. of undergraduate participants per year:** 10
- **Academic year or summer:** 10-week Summer REU Site
- **Other Components:** Ethics Workshop Included (no additional funds requested)
- **Point-of-contact for student applicants:** Dr. Giselle Thibaudeau, (662) 325-3017, and Giselle@emcenter.msstate.edu
- **Web address (URL):** <http://www.msstate.edu/org/mwgreu/> (to be developed)

PROJECT SUMMARY

Intellectual Merit - *Materials Working Group – Depth & Breadth of Materials Research* addresses the *need* to expose students to the true interdisciplinary nature of materials related research at micro and macro perspectives. The microperspective provides experience focusing on details of a well-defined research effort while the macroperspective enables the big picture view of large cooperative team research efforts. The *overall objective* of this proposal is to involve undergraduates in interdisciplinary materials research so that they are empowered to pursue advanced degrees. The research infrastructure and personnel are in place at Mississippi State University, through existing interdisciplinary activities of a dynamic group of materials science and engineering faculty, available research instrumentation and expertise, administrative commitment, and previous successful REU Sites experience to ensure success. The Specific Aim of this REU Site is to:

Expose student Participants to the essential interdependence and interdisciplinary nature of materials-related research. A Cooperative JIGSAW Strategy will be used to engage students in envisioning futuristic applications of interdisciplinary materials research. Each student Participant will be involved in both a meaningful individual research project (microperspective) as well as a team effort to develop a research strategy and solve a Group Jigsaw Challenge (macroperspective).

This project integrates best practices of recruitment/retention, introduces students to inquiry-based/collaborative interdisciplinary research, provides personalized mentoring, informs students about careers, and empowers students with the support and tools needed to pursue materials-related graduate degrees or careers.

Broader Impacts - *Diversity in Disciplines, Ideas and People:* Numerous broad impacts are inherent for all individuals involved in this interdisciplinary / collaborative REU Site. REU Participants, faculty, and graduate student mentors will gain a greater awareness of, and appreciation for, the contributions of many disciplines to materials research. The Jigsaw Challenge Groups will expose Participants to the larger perspectives of futuristic applications in materials research. Further, the participants will leave with a detail level perspective that is in context with a broad perspective, and will gain experience functioning on an interdisciplinary team. Jigsaw Challenge Groups will also strengthen existing collaborations between faculty while fostering opportunities for new, innovative ideas and projects. This project is a *creative* and novel model for incorporating undergraduate students into the research enterprise thus fostering interdisciplinary research perspectives and skills important for technological advancements in society.