



UTPA-UMN PREM

(PARTNERSHIP FOR RESEARCH AND EDUCATION
IN MATERIALS SCIENCE AND ENGINEERING)

Presented by:

Karen Lozano (PI)

Professor, Mechanical Engineering Department

At:

PREM, NSF Meeting

Arlington, VA

April 26th, 2010

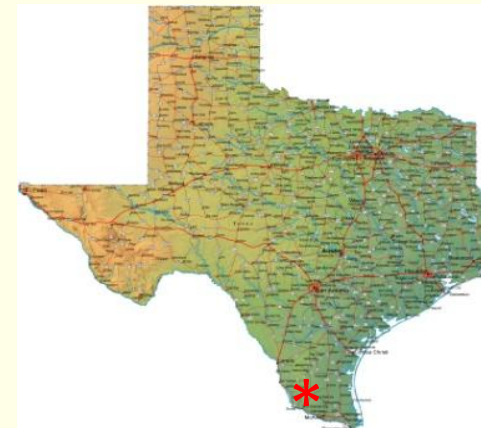




UTPA-UMN PREM



Program Objective: The objective of PREM is to broaden participation and enhance diversity in materials research and education by stimulating the development of formal, long-term, multi-investigator, collaborative research and education partnerships between minority serving colleges and universities, women's colleges, and colleges and universities dedicated to educating a majority of students with disabilities, groups that are underrepresented in science, technology, engineering, and mathematics (STEM) and the NSF Division of Materials Research (DMR)-supported centers and/or facilities.



University of Texas Pan-American, Edinburg, TX





Goals of UTPA-UMN PREM

- 1) To expand and consolidate a team of researchers at UTPA into a sustainable Center of Excellence to support materials science research in a Hispanic serving institution.

- 2) Provide junior faculty with a research platform to start or promote their materials science research and education careers.





UTPA TEAM



Arturo Fuentes
Mechanical Eng
Education & Outreach,
Research



Dorina Mihut
Mechanical Eng
Research



Dumitru Caruntu
Mechanical Eng
Research



Horacio Vasquez
Mechanical Eng
Research



Karen Lozano
Mechanical Eng
Management &
Research



Jose Gutierrez
Chemistry
Research



Aijie Han
Chemistry
Research



Magda Chipara
Physics
Research



Mircea Chipara
Physics
Research



Yuankun Lin
Physics
Research





UMN PREM Participants



Timothy P. Lodge
Chemistry & CEMS
MRSEC Director



Frank W. Snowden
CEMS, Assoc Director
Education and Human
Resources, MRSEC



Eray Aydil
CEMS
Research



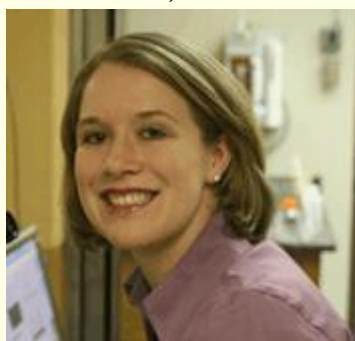
Marc A. Hillmyer
Chemistry
Research



Andreas Stein
Chemistry
Research



Uwe R. Kortshagen
Mechanical Eng
Research



Christy L. Haynes,
Chemistry
Research



David J. Norris
CEMS
Research



Phil Engen,
Education and Human
Resources Coord. &
MRSEC Webmaster



Russell J. Holmes
CEMS
Research





External Advisory Board



Dr. Enrique V. Barrera, Professor and Chair of Mechanical Engineering and Materials Science Department, Rice University, Chairman of the TAB



Dr. Jeremy Qualls, Associate Professor, Sonoma State University



Dr. C.J. Chen, Senior Scientist, YTCA America





Research Thrusts



1. To explore NP based materials including laser-induced aggregation of nanocrystallites, and NP-in-photonic crystal materials systems for application in photovoltaic solar cells.

UTPA partners: **Yuankun Lin, Jose J. Gutierrez;**

MRSEC partners: **Uwe Kortshagen, David Norris, Eray Aydil**

2. To explore soluble conjugated polymers for spin-processable, low cost, plastic light emitters, and to explore conjugated-polymer-in-photonic crystal systems as a low-threshold laser.

UTPA partners: **Jose J. Gutierrez, Yuankun Lin**

MRSEC partners: **Russell J. Holmes**





3. To explore functionalized nanoporous materials for the application of mechanical - to - interfacial energy conversion.

UTPA- Aijie Han

MRSEC partner- Andreas Stein

4. To develop self-healing materials with block copolymers as key ingredients to ultimately produce smart flexible materials.

UTPA partners- Magda Chipara, Karen Lozano

MRSEC partners- Timothy Lodge, Marc Hillmyer





5.To explore the science of nanoreinforced polymeric composite (NRPC)-thin film and metal-thin film (made of NRPC) interface through a combination of materials and deposition methods to improve the mechanical properties of materials capable of shielding electromagnetic interference.

UTPA partners- **Dorina Mihut, Karen Lozano**

MRSEC partner- **Christy Haynes**





Student Involvement



UG Students (Mentors)

Eva Flores (Fuentes/Lozano)

Ricardo Franco (Han)

Daniel Juarez (Vasquez)

Jose H. Alvarez (Lozano)

Iris L. Alvarado

(Chipara/Caruntu)

John Taylor (Caruntu)

Eric Torres (Vasquez)

Paul Castro (Caruntu)

Cittlali Rincon (Lin)

Simon Padron (Lin)

Omar Torres (Fuentes)

Rafael Villegas (Chipara)

Abraham Alvarado (Gutierrez)

Nancy Puente (Chipara/Lozano)

Sergio Gonzalez (Mihut)

Haydi Soto (Lozano/Chipara)

Rolando Soto (Gutierrez)

Getsemani (Fuentes)

Graduate Students (RT Mentors)

Sun Zhongyuan (RT 2 - Han)

Pedro Chapa (RT 2 – Chipara/Lozano)

Adrian Garcia (RT 2 – Mihut/Lozano)

Postdoctoral Research Assoc

Dr. Ananta Adhikari





OUTCOMES

PAN AMERICAN

Texas 78541-2999 • (956) 381-2111 Office • (956) 381-2114 Fax



(09/10: 055)

MEMORANDUM

DEC 3 09 PM 3:05 / PA6 / PROVOST

The University of Texas
Pan American
RECEIVED

DEC 01 2009

Office of the President

TO: Dr. Charles Sorber
Interim President

• IDC commitment to the project

FROM: Dr. Paul Smith
Provost/VP for Academic Affairs

DATE: December 1, 2009

• Formal establishment of the proposed Materials Science Center

SUBJECT: Recommendation for the Establishment of the Center for Research in
Nanotechnology and Materials Science

This is to request your approval for the formal creation of the Center for Research in
Nanotechnology and Materials Science as required in HOP 3.3.7.C., *Centers and Institutes*. The
justification and support from the Dean for the College of Sciences and Engineering and Vice
Provost for Graduate Studies, Academic Centers and Continuing Education are attached for your
review.

• Taskforce on Support Infrastructure and Processes
Associated with Externally Funded Projects

The attached proposal includes a five-year budget that identifies future funding streams in
support of the center. Initial support for this center was established through various
funding sources.

With great pleasure, I am recommending Dr. Karen Lezin, Professor of Mechanical
Engineering and Julia Beecherl Endowed Professor, as the initial Director of the Center for
Research in Nanotechnology and Materials Science. Given her extensive research
accomplishments, I believe that this center will grow and succeed under her leadership.

Please do not hesitate to contact me if you have any questions.

• Development of the UTPA-UMN PREM webpage

<http://www.utpa.edu/colleges/cose/prem/>

Approved:

Dr. Charles Sorber, Interim President

Date: 12/2/09

Attachments

cc: Dr. Cynthia Brown
Dr. Ed LeMaster





OUTCOMES



- TAB meeting held February 1st 2010





OUTCOMES



- Videoconferences, teleconference, emails
- REU Students
 - Haidy Soto
 - Erick Torres
- Faculty-student program
 - Aijie Han – Steve Zambrano
 - Abraham Alvarado – Jose Gutierrez
- RET





UMN MRSEC Undergraduate program elements



| Program | Partner(s) | Activity | MRSEC Role |
|---|---|---|--|
| REU | National base of colleges and universities; NSF; UTPA - PREM | 10 week summer research experience, supplemented with a suite of enrichment and professional development activities; all 3 programs combined; | E&HR Director organizes and coordinates; IRG and Seed faculty, students and postdocs act as research mentors |
| Native American Fellows | Tribal Colleges | August 2010 renewal - REU | |
| Faculty-Student Teams | Tribal Colleges and 4-year schools; UTPA - PREM | | |
| RET | Local schools, NSF UTPA-PREM | 5-week summer research experience in a MRSEC faculty lab | E&HR Director oversees; funds Teacher Research Coordinator (TRC) position |
| Summer Undergraduate Research Expo (MRSEC SURE) | Various REU programs in IT, and undergraduates from local colleges, UTPA-PREM participants | Poster session for ~100 undergraduate research program participants | Organization, advertising, coordination, sponsorship |
| College of Menominee Nation Partnership | College of Menominee Nation, Department of Education | Continuing Curriculum development collaboration | Finalizing articulation agreement |
| Louis Stokes Alliance for Minority Participation (LSAMP) | North Star STEM Alliance; NSF | Multifaceted program to increase participation of URM students in STEM | REU opportunities, faculty and student mentoring |





OUTCOMES



- Dr. Stein (UMN) will attend the MS thesis defense of Miss Sun to be held May 2010 at UTPA
- Dr. Lozano serves now in the External Advisory Board of the UMN MRSEC will travel to UMN June 14th
- The first joint annual symposium is being developed. Will take place at UTPA during HESTEC week. Students will participate through poster and oral presentations, UMN faculty will give oral presentations to a broad audience, UTPA faculty and students (about 400 people).
- UTPA faculty will attend UMN's Industrial Consortium (>35 companies) called IPRIME (www.iprime.umn.edu) on June 3rd 2010.

