



PREM Update

Idalia Ramos, University of Puerto Rico at
Humacao



MRSEC Directors Meeting - June 24, 2010





Partnerships for Research and Education in Materials

.... to enhance diversity in materials research and education by stimulating the development of formal, long-term, collaborative research and education partnerships between MSI's and NSF-supported centers and facilities.

Awards to minority serving institutions. Partnerships based on intellectual connections.

Interdisciplinary materials research at both institutions.

Education programs to build a pipeline of students in materials science.

PREM Competitions

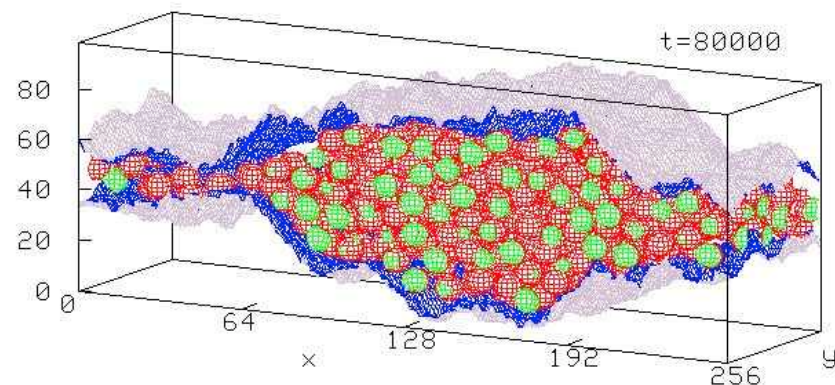
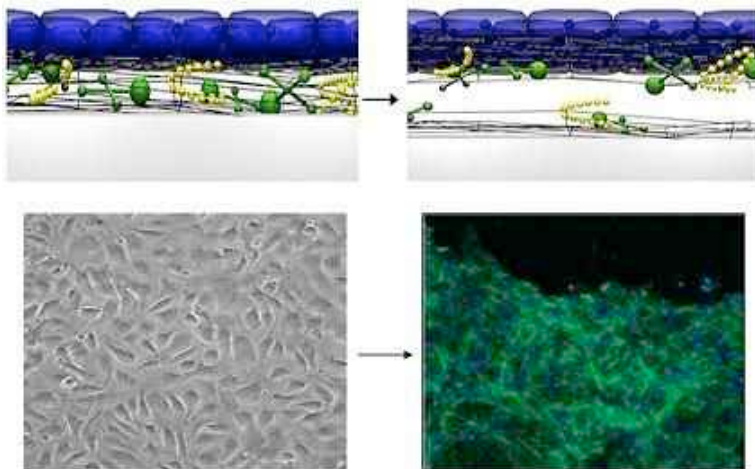
2004: 4 Awards

2006: 6 Awards

2009: 8 Awards, 7 New + 1 Renewal

Currently: 14 PREM Programs involving 14 MSIs,
13 MRSECs, 1 STC and 1 NSEC

7 Hispanic, 6 HBCU, 1 Majority

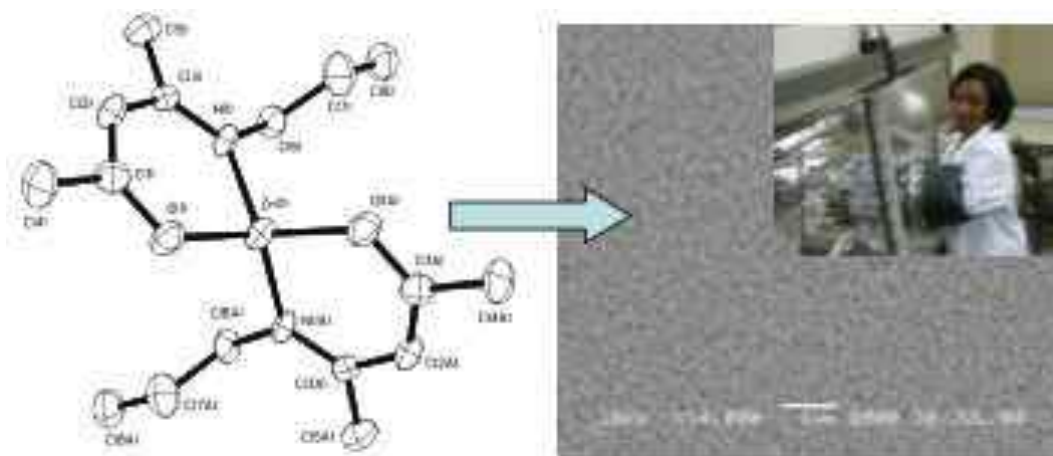


Institution	Partners
California State University -Northridge	Princeton MRSEC
Howard University	Johns Hopkins MRSEC, Prince Georges Community College
Jackson State University	U California-Santa Barbara MRSEC
Norfolk State University	Cornell MRSEC, Purdue
Tuskegee University	Cornell MRSEC
University of New Mexico	Harvard MRSEC
City College of New York	Chicago MRSEC
Clark-Atlanta University	GA Tech MRSEC
New Mexico Highlands University	U Washington STC
University of Puerto Rico-Humacao	U Penn MRSEC
University of Puerto Rico-Mayaguez	U Wisconsin NSEC and MRSEC
University of Texas-Pan American	Minnesota MRSEC
University of Texas-San Antonio	Northwestern MRSEC
Xavier University of Louisiana	NYU MRSEC

Overview of first cycle

Accomplishments (cont)

- Development of new courses and programs at MSIs
- Increased opportunities for minority students
- New and extended outreach efforts. Strong interactions with K-12 students and teachers, schools, and communities



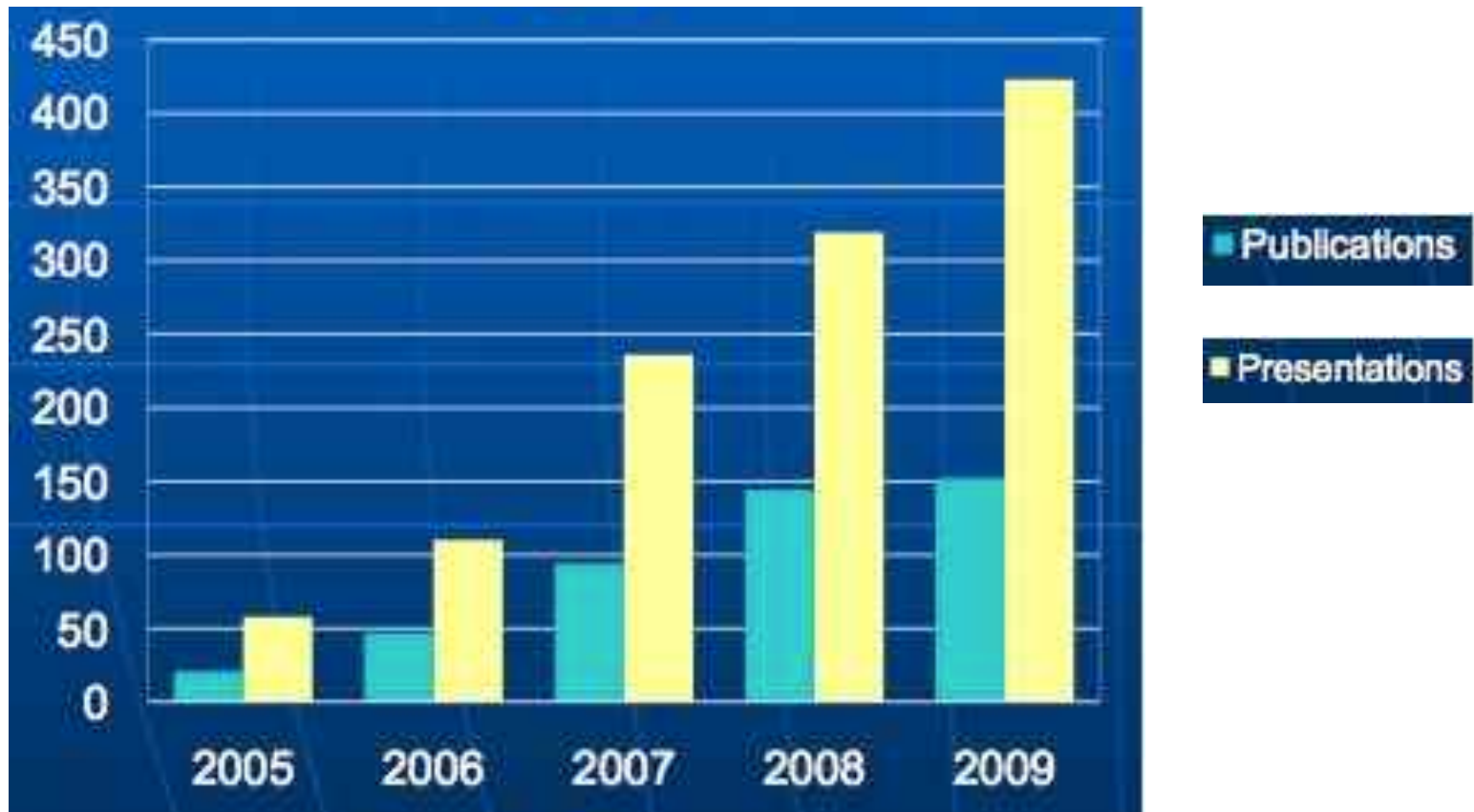
Demographics* (2004 & 2006)

	Total (affiliated)	% Women	% URM's
Faculty at MSI	87 (21)	34	52
Faculty at Partner Inst	62 (56)	18	8
Post-docs	21 (1)	33	19
Graduate Students	117 (16)	48	72
Undergrads	158 (27)	54	87
K-12	53 (16)	40	66

* Sean Jones, Tom Rieker and Bill Brittain, March 2010

Affiliated: non-PREM Support

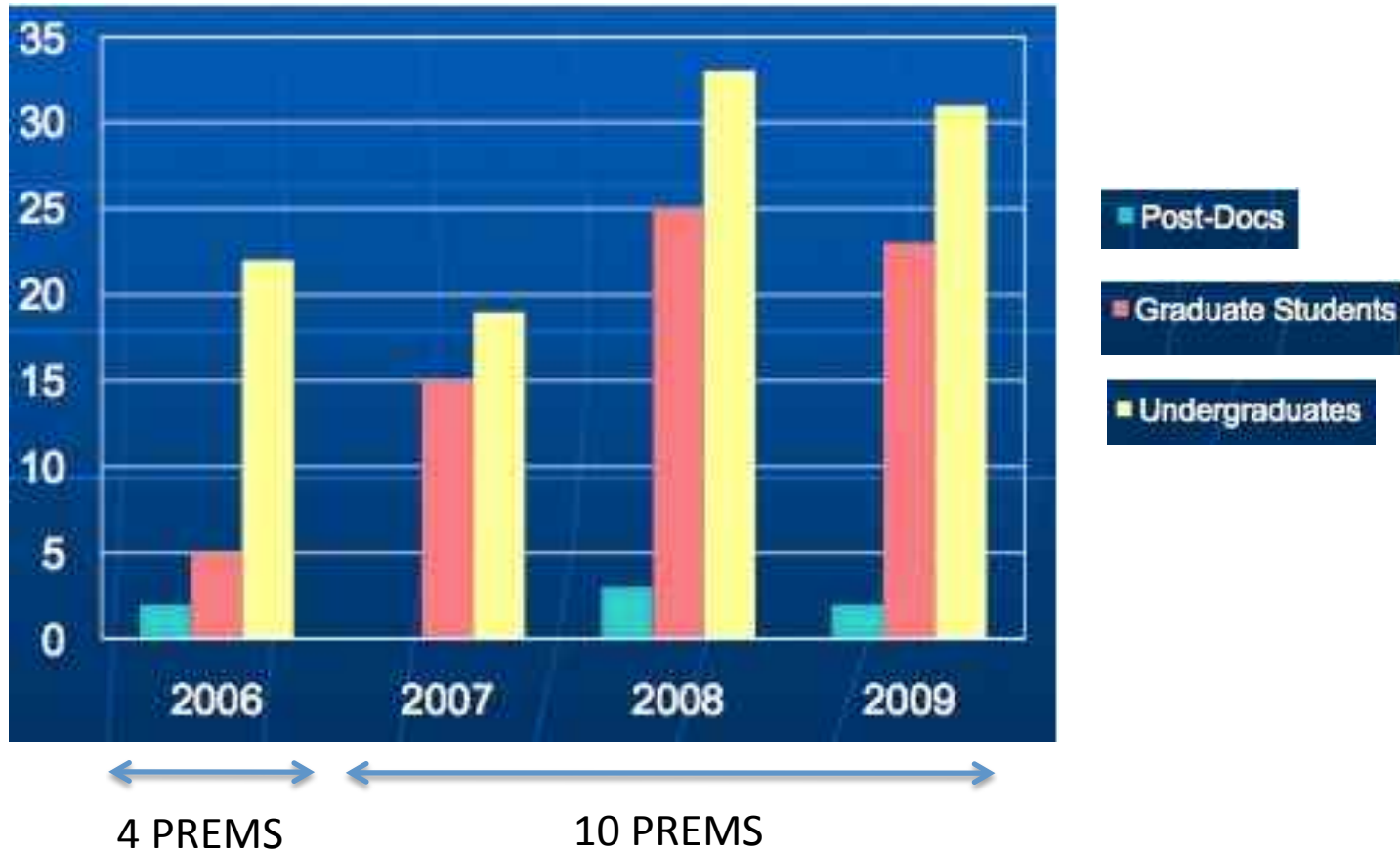
PREM Productivity



← 4 PREMS → ← 10 PREMS →

* Sean Jones, Tom Rieker and Bill Brittain, March 2010

PREM Graduates



* Sean Jones, Tom Rieker and Bill Brittain, March 2010

PREM Graduates

Post-docs	8	3 faculty 2 industry 3 other
Graduate Students	63	6 faculty 7 post-doc 17 grad school (Ph.D.); 27% 2 research assistant 22 industry; 35% 6 other, 3 unknown
Undergraduates	112	59 grad school; 53% 7 med school 1 research assistant 39 industry; 35% 5 other, 1 unknown
K-12	100	16 college 84 unknown

* Sean Jones, Tom Rieker and Bill Brittain, March 2010

PREM PI Meeting 2010

March 26, 2010, Arlington VA

Overview of PREM Program

Best Practices

- Classes 2004 & 2006

2009 PREM Programs Descriptions

- Class 2009

Working Groups:

- Building the Pipeline
- Partnerships
- Integration of Research & Education

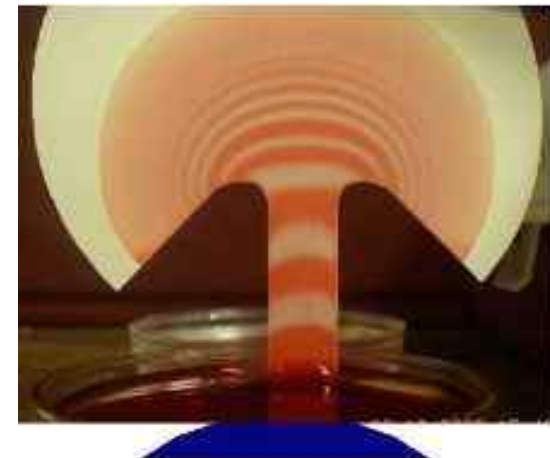
NSF Programs and Funding Opportunities



68 participants from PREM teams
and NSF

2004 & 2006 PI Presentations

- Maximizing Partnerships
- Building the Pipeline
- How to build upon the PREM Award
- Building your Research Program through other Funding
- Getting Students excited about Materials Science
- Working with Administration on Building and Sustaining a Culture of Research



Partnerships

Functional Model: “A true partnership is based on intellectual collaboration.”

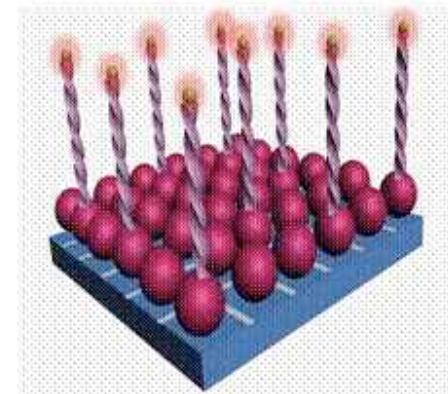
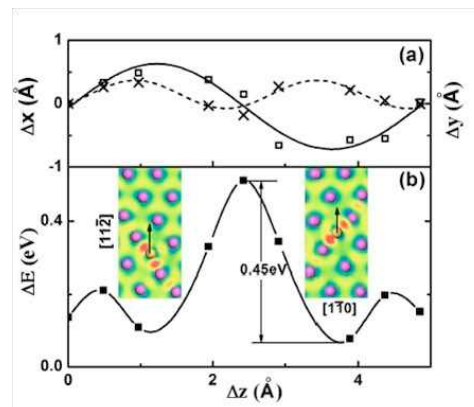
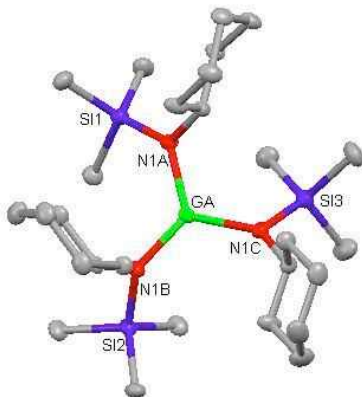
A true collaboration has constant contact.

Suggestions:

It is necessary to make efforts to evaluate the synergy of activities, where the strengths of both institutions can be clearly defined and enhanced.

Extended Discussion:

The vision should not define the PREM institute as exclusively for outreach ... Maintaining a collaborative research vision is often easy, but working together on the outreach mission can be challenging.



Partnerships

Indicators of a successful partnership

Shared publications

Dynamic relationship

- Research interests evolve
- Partners work together to develop new paths of independent expertise
- PREM institution becomes a natural collaborator

Co-advised students

- How many MSI faculty co-advise students from MRSEC?



Life after PREM

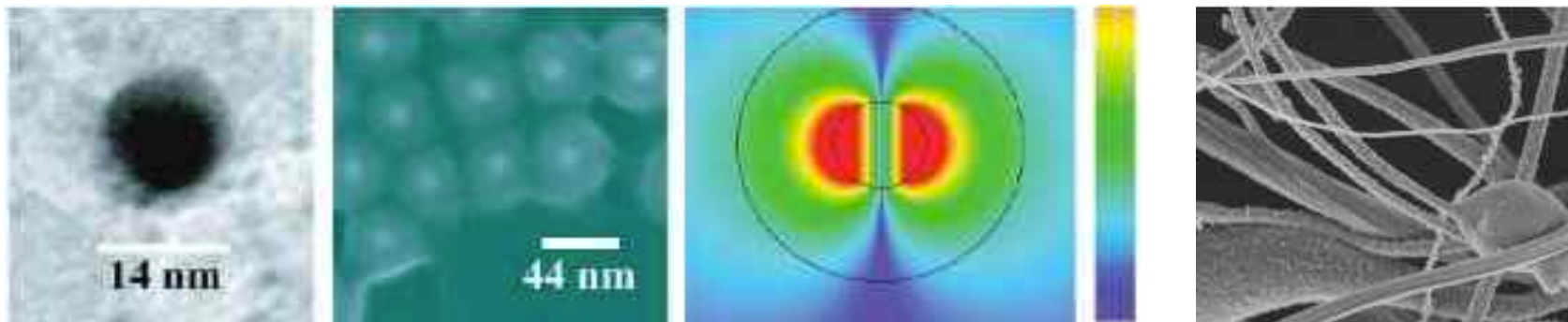
There are concerns about the future of partnerships after the grant ends and about ways of obtaining intermediate levels of funding.

Suggestions

The 'mature' partnerships can serve as models where funding success has been achieved through a true intellectual exchange.

PREM funding could be thought of as SEED money that should be leveraged to yield funding in parallel areas.

To encourage PREM participation explicitly in IRGs (seed funding for new ideas and lead roles).



Building the Pipeline

PREM institutions play a significant role in their communities and have strong links with minority populations.

Hierarchy of where the PREMs effect the most influence:

1. K-12
2. Undergraduate (including Community Colleges);
3. Graduate
4. Postdocs
5. Faculty



Building the Pipeline

Goal: to create a pipeline that supports the materials science training/ education of the best undergraduate students from underrepresented groups

Concern: Lack of resources and contents in HS curricula

K-12 Efforts:

- Provide more research experiences for minority K-12 students
- Introduce materials science tracks in HS programs
- Maintain ongoing interactions and training of teachers



Building the Pipeline

Concern: trend of minority students not wanting to leave MSIs for graduate studies

Need to strengthen interactions with partners and other MRSECs to help more minority students get into and “through the pipeline”

- Frequent visits of MRSEC partners to MSI’s
- Annual PREM-partner conference for undergraduates
- Database of PREM and MRSEC programs that highlights the students’ interests and goals

Other suggestions

- Regional Meetings and exchange programs between PREMs
- Research Experience for Faculty (REF) from PREM Institutions



Integration of Research and Education

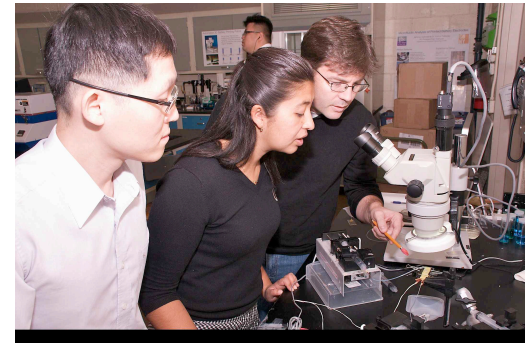
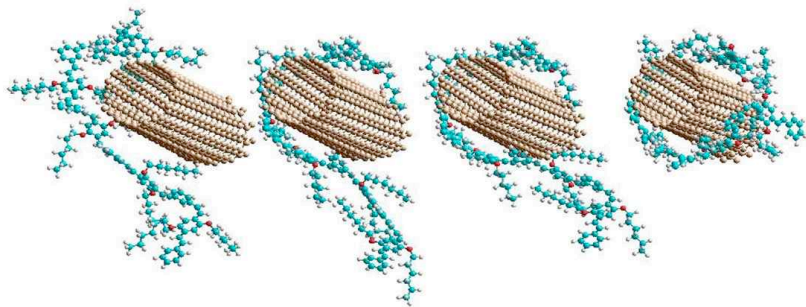
Faculty should incorporate research news and his/her own research involvement into the individual courses.

- Courses developed with partner institutions can be “web-based”.

Integrate research into outreach programs and develop seminars for high school students.

Introduce other topics into credit-courses or seminars: research techniques (sophomores), ethics, how to build a labnote, lab-safety, presentations, etc.

- Take advantage of existing resources developed by MRSECs and professional societies.



Integration of Research and Education

Design hands-on component to courses to prepare students better for industry jobs. Introduce significant mentoring during the lab portion of the course.

Build a “research community” for undergraduates. Provide stipends, travel to conferences, etc. Train experienced students to serve as mentors and teachers for new students.



Next ...

New PREM brochure in preparation:
prem-mrsec.org

Next PREM PI Meeting: March 2011,
Humacao Puerto Rico

Next PREM Competition: Late 2011
or Early 2012

