



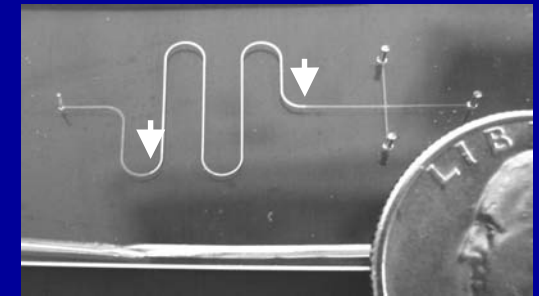
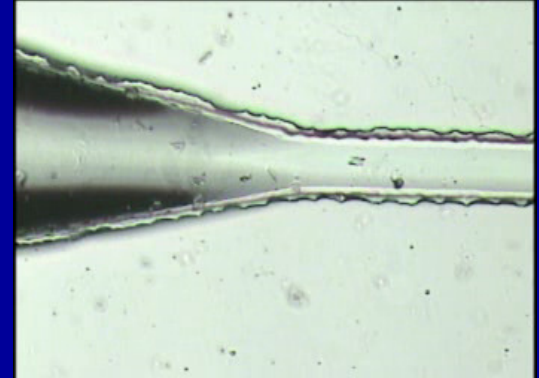
PREM: The Good, the Bad and the Future



Frank A. Gomez, Ph.D.

Director, CSULA-CIT PREM Collaborative

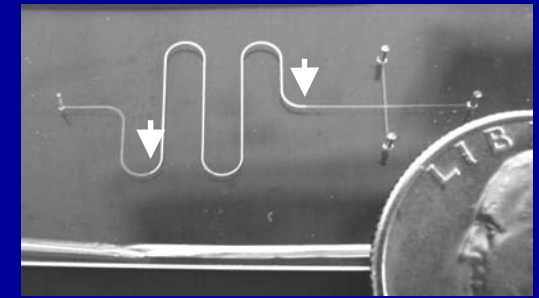
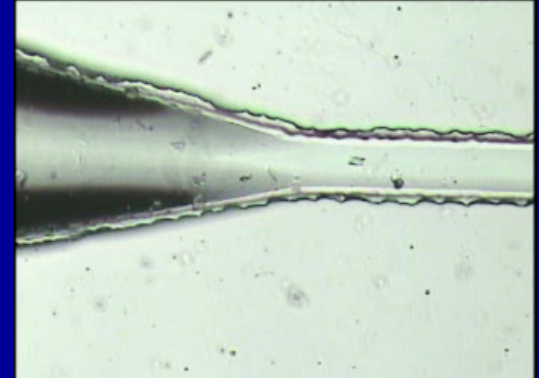






Passion

Passion



Passion

The Good

Institutional

- 310: total number of students supported since 2004. (\$40K/student)
- 249: underrepresented students supported since 2004. (\$50K/student)
- 204: number of publications since 2004. (\$60K/publication)
- 752: number of presentations since 2004. (\$15K/presentation)
- New coursework and curricular offerings.
- New and strengthened research infrastructure.
- New buildings.



Partnership for
Research & Education
in Materials

UFRSM Universidad de
Puerto Rico
en Humacao

**International Symposium
on Advanced Materials:
Building Functional Systems
via Self-assembly**

Featuring:

- Bert Meijer**
Eindhoven University of Technology
- Roeland Nolte**
University of Nijmegen
- Virgil Percec**
University of Pennsylvania
- Simona Percec**
Dupont, Central Res. & Dev.
- Nicholas Pinto**
UPR, Humacao
- Jos Put**
DSM Research, Geleen

Conference Location
Four Points By Sheraton
170 Candelaria Drive
Humacao, 00791, PR
PH: 787-850-6000

date: Friday, April 27, 2007
time: 10:00 am – 4:00 pm
place: Palmas del Mar,
Humacao, Puerto Rico

MRSEC Penn
NSF

For more information, visit <http://www.uprh.edu>
PH: 787-870-0000 ext. 2002 Fax: 787-870-1000 Email: j.montalban@uprh.edu, symposium.uprh.edu



The Good

Institutional

- Strengthening of collaborations between PREM institution and MRSEC partner. (CSULA-CIT)
- Vertically and laterally integrated K-12 outreach program. (UNM)
- Faculty and student awards. (UPRM w/r CAREER and PECASE)
- PREM support helped secure (leverage) increased funds from NSF and other federal agencies. (CSULA w/r CBC, IGERT,)
- Increased number of publications and presentations (All PREMs).
- New faculty hires (UNM).
- New departments and centers have been created. (biomaterials at UNM)



Nayomi Z. Plaza
Rodríguez

In May 2007 PREM students received two of the sixteen awards given to the **most outstanding graduating high school students** in Puerto Rico.

Coraly and Nayomi are now PREM sophomore students in the UPRM Mechanical Engineering program.



Coraly I. Sotomayor



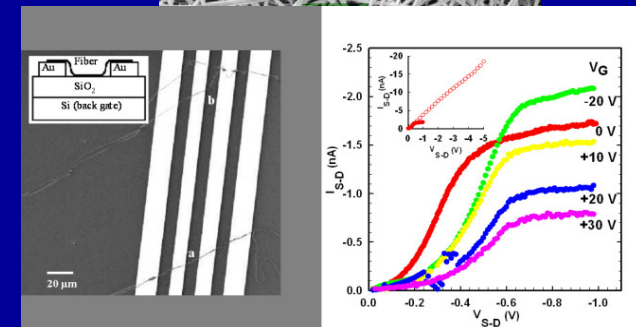
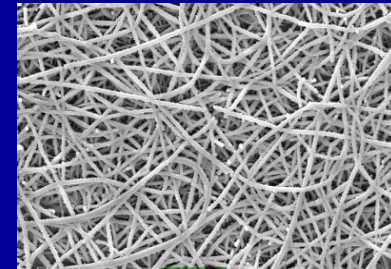
The Good

Research

SiC nanowires (HU)

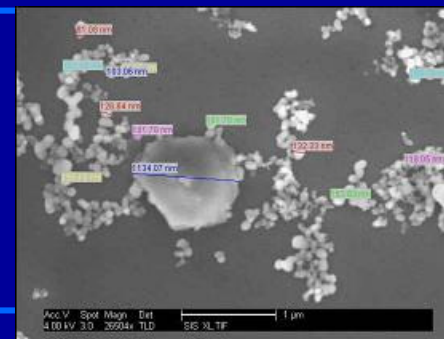


Nanoelectronic Devices (UPRH)



Al Matrix Composites (UPRM)

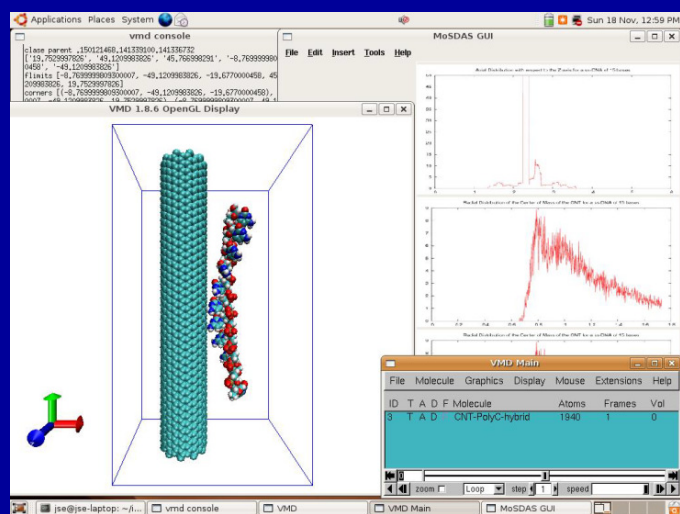
Mechanical alloying of Al matrix composites was successful by using Al pellets with different loadings of MgB₂ powder (~40 μm), followed by vacuum heat treatment of the ball-milled samples at 900°C. The resulting material contained Al_{1-x}Mg_xB₂ particles with a bimodal size distribution: large particles (average size of ~5 μm) and the small ones (< 80 nm.). The process allowed preparing nanoprocessed inoculants to treat Al alloy melts to produce fine-grained castings.



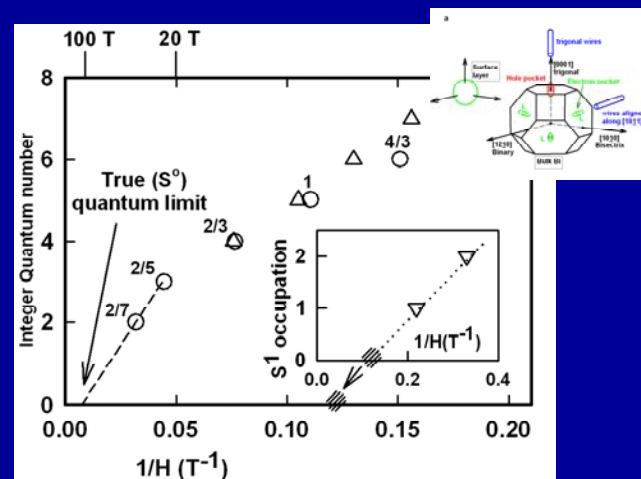
The Good

Research

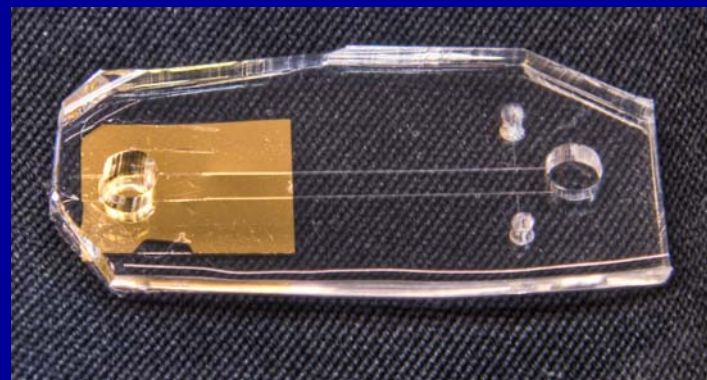
Computational Modeling (UPRH)



Bi Magnetic Resonances (HU)



Surface Plasmon Resonance (CSULA)



The Good

- PREM retreats.



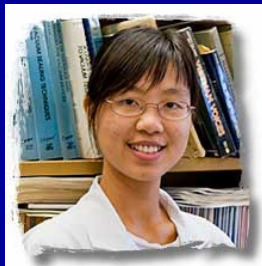
- PREM events.



The Good

- PREM Student Summer Opportunities

NSF-MRSEC
Sub. FG



NSF-IRES
FG, JR



UCSB



The Good

- PREM High School Research Program



Rocio Vides (Stanford)

The Good

- PREM Community College Research Program

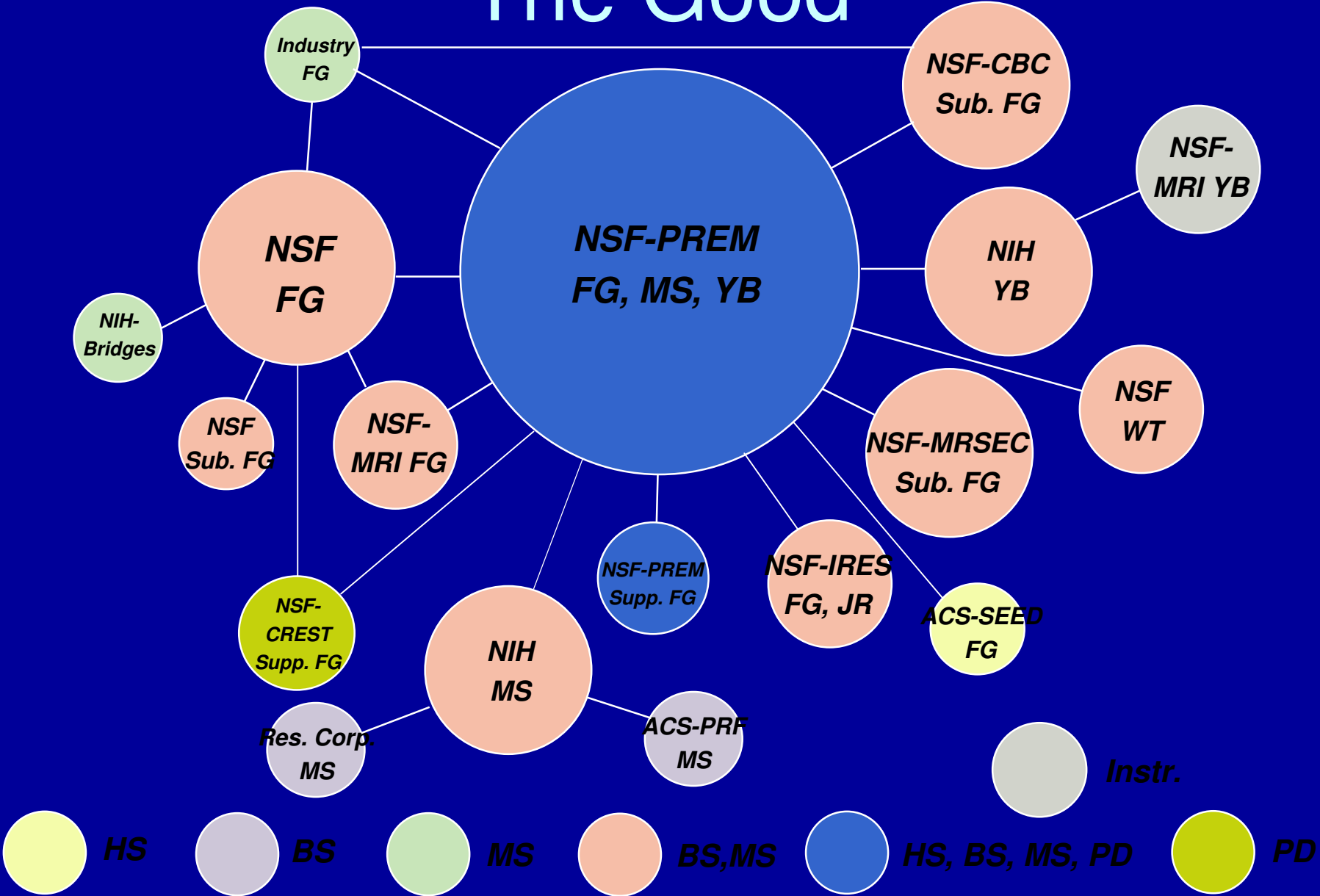


The Good

- PREM In the Community



The Good



The Bad

PREM Institution Administrations

- Lack of vision in university administrators.
- Lack of trust in university administrators.
- Lack of institutional support in the form of administrative support for PREM directors, faculty and students (staff and office space, faculty release time, student support).
- Research infrastructure (space, lab logistics, electricity / water supplies, library resources) on campus is not entirely conducive to success of the PREM program.
- Rigid hierarchical structure (almost Kafkian) of institutions limit access to university authorities despite the significance of the grant (sometimes the largest in school's history)
- Excessive bureaucracy (common to most PREM institutions)



The Bad

PREM Institution Administrations

- Do not reduce research space for PREM faculty (CSULA).
- Transitions in administration threaten allocation of research resources to PREM PIs (UNM)
- University administrators feel entitled regarding indirect costs.
- Little to no indirect costs are returned to department, faculty and PREM program.
- Grants offices are ineffective (8-to-4 government mentality) regardless of the urgent needs of the researchers. (UPRM, CSULA)
- Vendors are paid late, are not paid; lots of lost paperwork.
- Accounting systems are poor (PeopleSoft, HU)



The Bad

PREM Partner Institutions

- Structural changes in MRSEC hurt PREM's research collaboration with the partner institution (UPRM-UW).
- MRSEC awarding/renewal cycles are not in phase with PREM's cycles.
- MRSEC abandons research themes central to PREM for successful renewal.
- Transitions in MRSEC administrations have resulted in a breakdown in its institutional relationship with some partner institutions.
- MRSEC faculty are sometimes difficult to engage as they see little advantage in working with PREM institutions.
- Elitist attitude still persists.
- MRSEC and like institutions use PREM institutions for obtaining more funds only sometimes shared with PREM schools.

The Bad

PREM Program

- Difficult to recruit talented minority students (JSU).
- Difficult to recruit minority and/or US born postdoctoral fellows (many institutions).
- PREM faculty firstly hire postdocs from their country of origin.
- Difficult to match PREM faculty with MRSEC faculty.
- PREM faculty are sometimes difficult to engage.
- Sense of envy and jealousy by non-PREM faculty who are less research-inclined.

The Future: Solutions

PREM Institution Administrations and Institutions

- More support (MONEY, MONEY, MONEY) from our administrations.
- Educate administrators and PUSH, PUSH and PUSH them.
- If PREM looks good, they look good.
- Make it an issue with NSF and the NSF Board. Give names of who is getting in “our” way to success.
- Inform local state and congressional representatives.
- Take it to the newspapers, local TV stations, e-mail, blogs, etc.

The Future: Solutions

PREM Directors

- Focus and streamline research IRGs. Get rid of those who bring you down. Add those who bring you up.
- Look outside your present MRSEC partner to other PREMs, MRSECs and other institutions.
- Strive for an interdisciplinary approach to science.
- Research goals should strive to solve societal problems.
- Build a PREM REU program for student exchanges. (CSULA-UCSB)
- Initiate a PREM sabbatical program for PREM faculty.

The Future: PREM Renewals



The Future: PREM Renewals

Demand the best for your PREM program. PREM administrations must:

- Match one unit of academic release for every two units requested from NSF.
- Provide support for one full-time PREM technician.
- Provide an office and support no less than 0.5 time PREM coordinator.
- Provide support for one PREM postdoctoral fellow similar to the Camille Dreyfus program.
- Provide travel support for five students per year to attend scientific conferences.
- Provide support for three students to participate in PREM REU programs.
- Provide sabbatical support for three faculty at partnering MRSEC or PREM institutions.
- Increase (not decrease) research space for new PREM faculty or your faculty will look to move.

Over and Over and Over Again





Passion



Acknowledgments

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The Gomez Research Group
2008

Thank you.

Questions?