



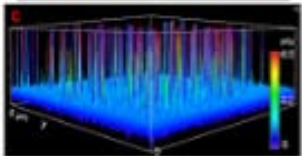
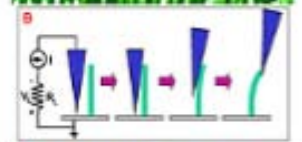
# National Science Foundation Division of Materials Research

<http://www.nsf.gov/materials>

Integration of Materials Research  
and Education at all levels

# Division of MATERIALS RESEARCH (DMR)

- **Inherently interdisciplinary** (*materials synthesis, characterization, novel phenomena, measurements and modeling .... devices*)
  - **Basic research**, but often with potential applications
  - **Materials 'community'** is very broad: *physicists, chemists, materials scientists, engineers, biologists, mathematicians, computer scientists, educators.*



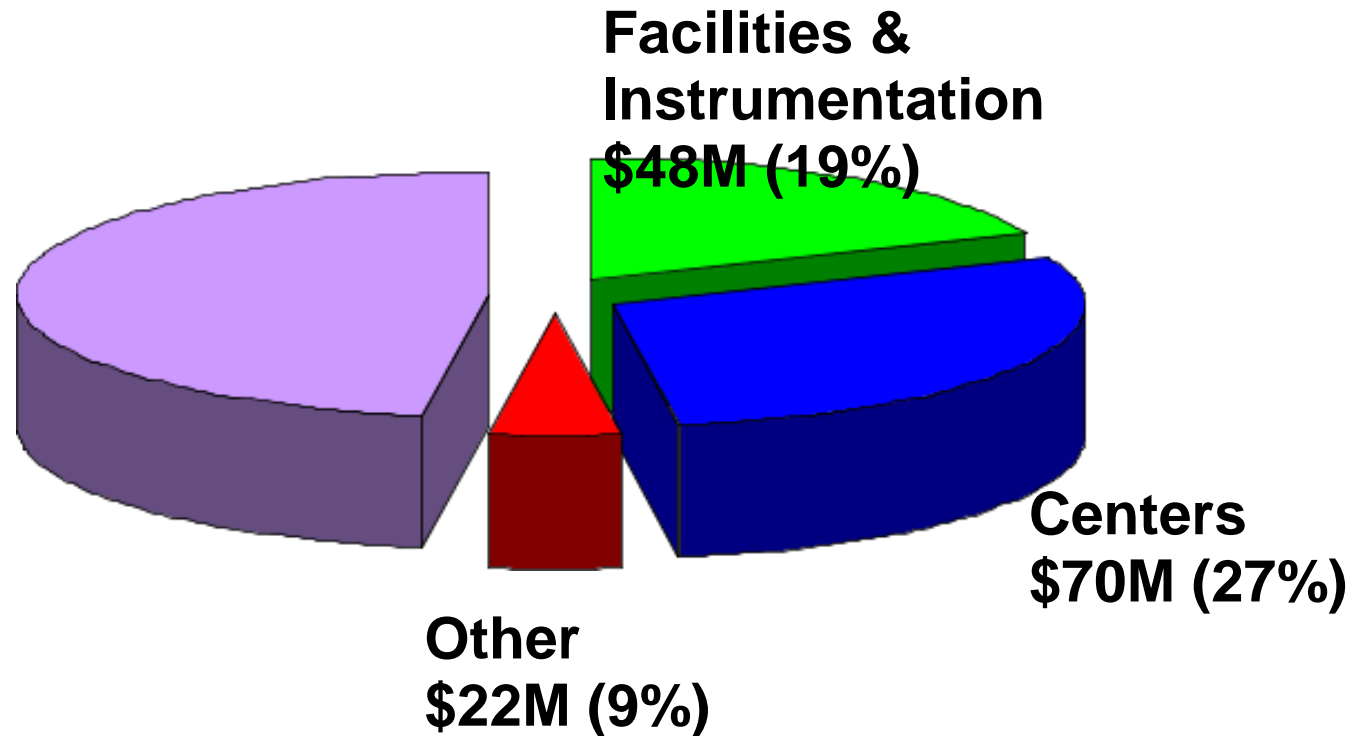
**Education and Outreach activities** are supported in all DMR programs  
**-- Centers play a major role**





# DMR Budget \$257 M in FY2007

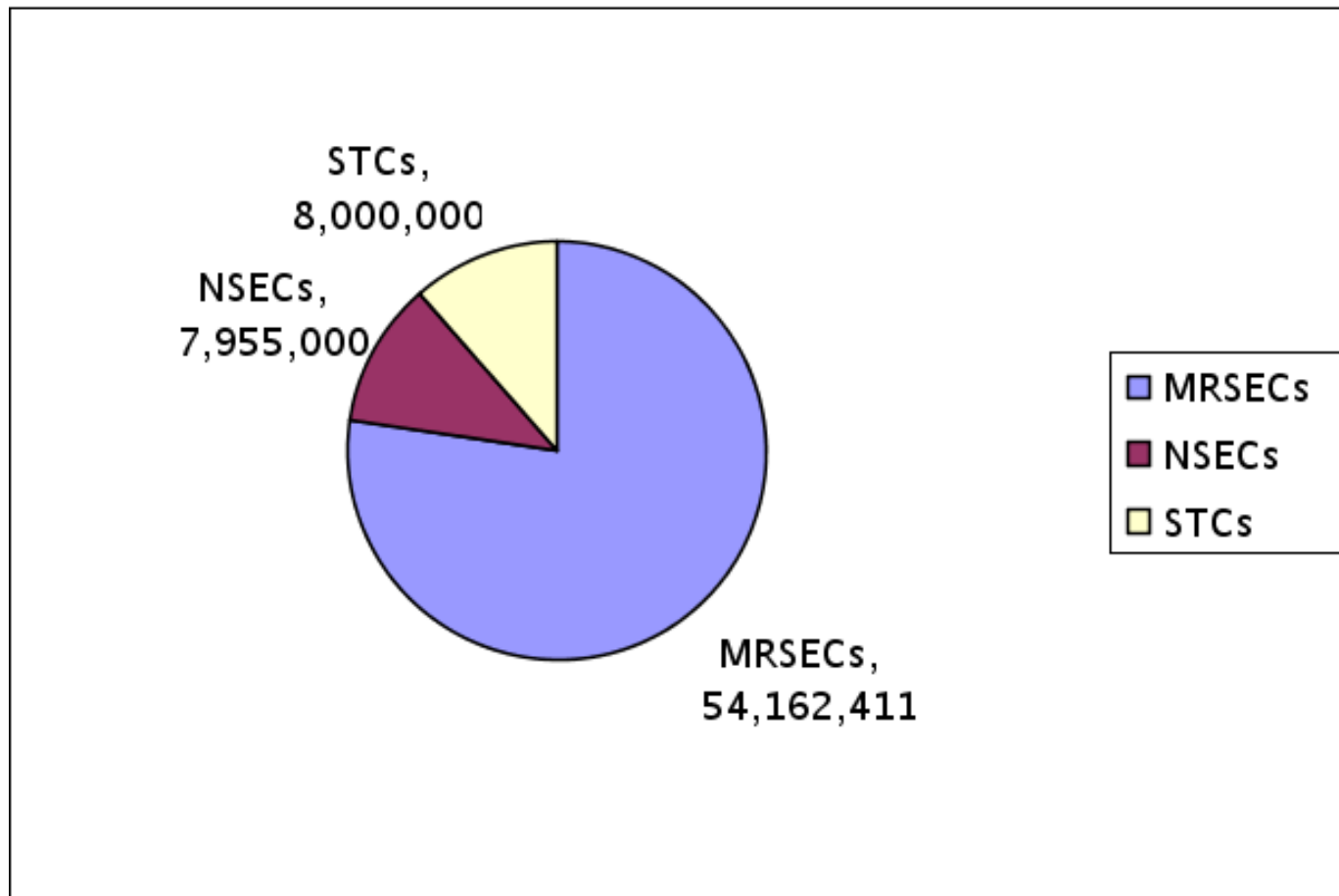
**Individuals &  
Groups  
\$117M (45%)**



***Total NSF support for materials is over \$400M annually***  
***(including support from CHE, ENG, and others)***



# DMR Centers 2007



FY 2007 \$70.1M

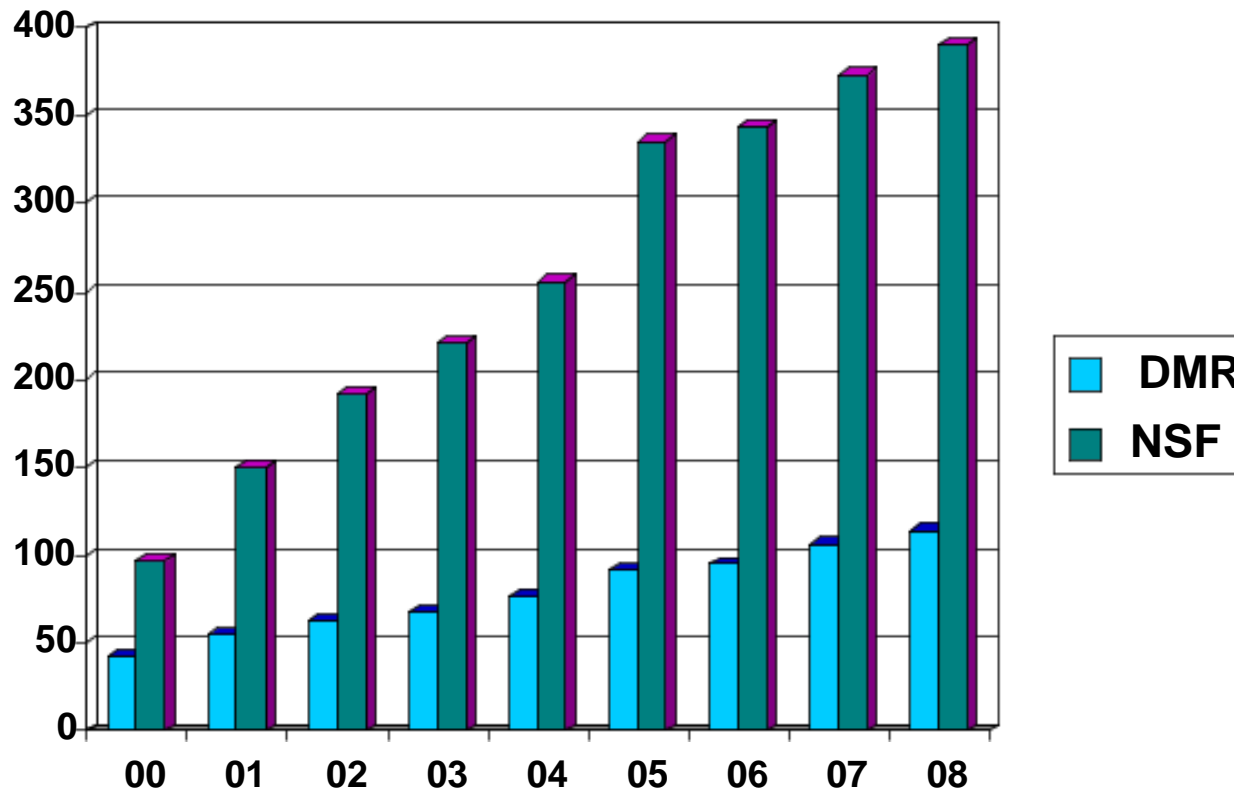


# NSF Support for Nano

Wide Spectrum of Topics and Support Modes

Individuals, Groups, Centers, Networks, Facilities, Education, SBIR...

FY 08 REQUEST \$380M (NSF), \$114M (DMR)



DMR support for nano is now mostly 'mainstreamed' via *unsolicited* proposals (individuals and groups); centers competition; or instrumentation & facilities



# University-Science Center

## Interactions

- Outreach efforts aimed at increasing science literacy of general public
  - Individual Investigators and small groups
- lectures, exhibits
- Large center (MRSEC, NSEC ...) activities
- local museums and networks (NISE, NNIN)
- Science exhibits (permanent & traveling)
- Art, archival preservation and restoration using nondestructive S&E tools (e.g., IMR grant)

-- Activities and collaborations throughout the nation

-- Several funding sources



<http://www.nisenet.org/>



ESI-0532536

**NanoExpress** – a mobile trailer with a fully functional Nano Science and Technology Lab – takes cutting edge science to school children and public.



“**NanoExpress**” developed at the National Nanofabrication Infrastructure Network (NNIN) node at Howard University

Housing research instruments like Scanning Electron and Atomic Force Microscopes, NanoExpress lets the visitors explore nanoparticles and their characterization.

“**Strange Matter**” is a traveling interactive exhibit which introduces materials science through several hands-on experiences.



“**Strange Matter**” at Liberty Science Center

- Interactive website  
<http://www.strangematterexhibit.com/>
- 5-8th grade Teacher guide  
<http://www.strangematterexhibit.com/teacher.html>



# PREM brings *Materia Extraña* to Puerto Rico

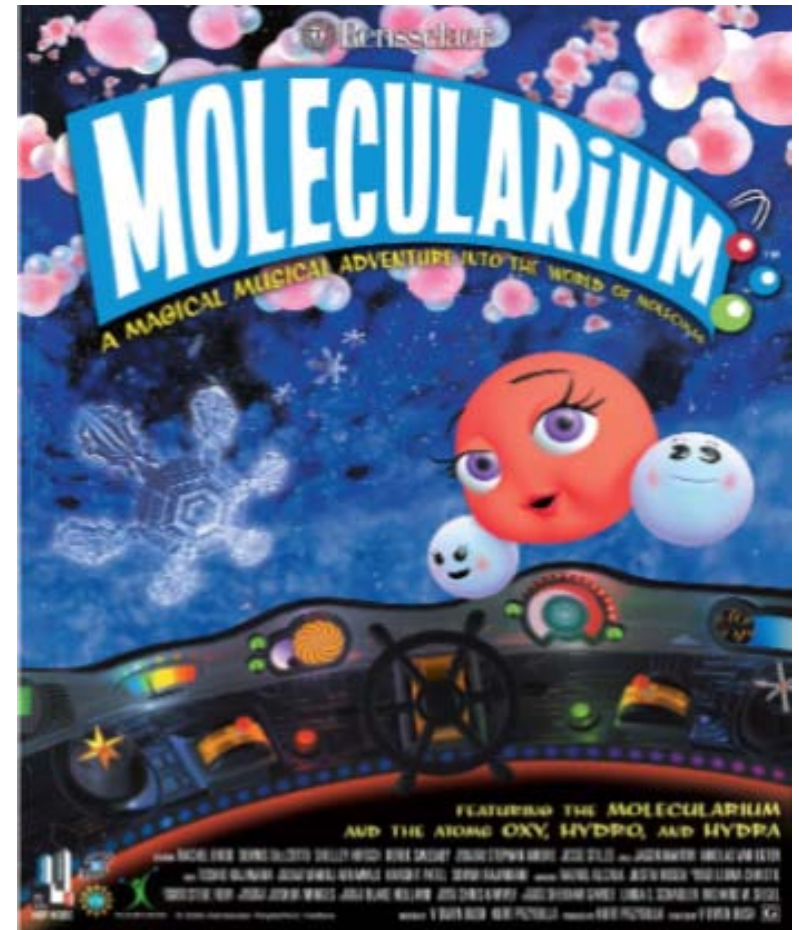
October 25 – December 22, 2007, Casa Roig Museum, Humacao,  
[prem.uprh.edu/materia](http://prem.uprh.edu/materia)



Over 5,700 people from 61 towns in PR & 6 US States visited the Strange Matter (*Materia Extraña*) Exhibit in Humacao, Puerto Rico. Approximately 100 volunteers collaborated with the presentation that included guided tours and complementary talks and demonstrations.



**small Wonders:  
Find the Nano in your Life  
Penn State MRSEC DMR-  
0213623**

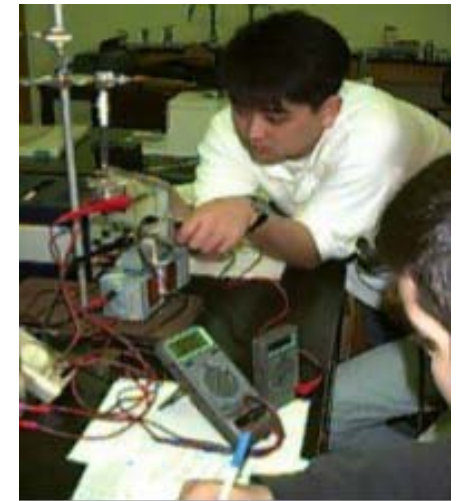
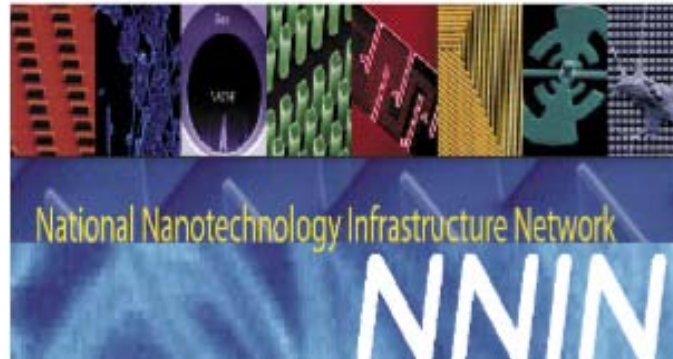


<http://www.molecularium.com/index.html>  
Rensselaer Polytech. Inst.  
NSEC - DMR-0117792,  
0642573

*Thank you!*



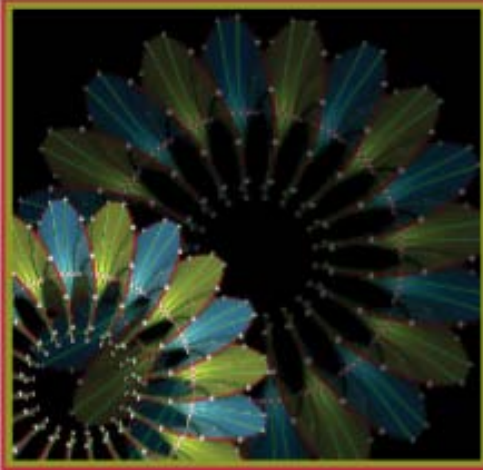
NHMFL Open House



U. Alabama Summer REU/RET Site

National Science Foundation

## INVESTING IN AMERICA'S FUTURE



STRATEGIC PLAN  
FY 2006-2011

**NSF VISION:** Advancing discovery, innovation, and education beyond the frontiers of current knowledge, and empowering future generations in science and engineering.



**MISSION:** To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense (NSF Act of 1950)



### Strategic Goals

**Discovery**  
*Advancing frontiers of knowledge*

**Learning**  
*S&E workforce and scientific literacy*

**Research Infrastructure**  
*Advanced instrumentation and facilities*

**Stewardship**  
*Supporting excellence in S&E research and education*

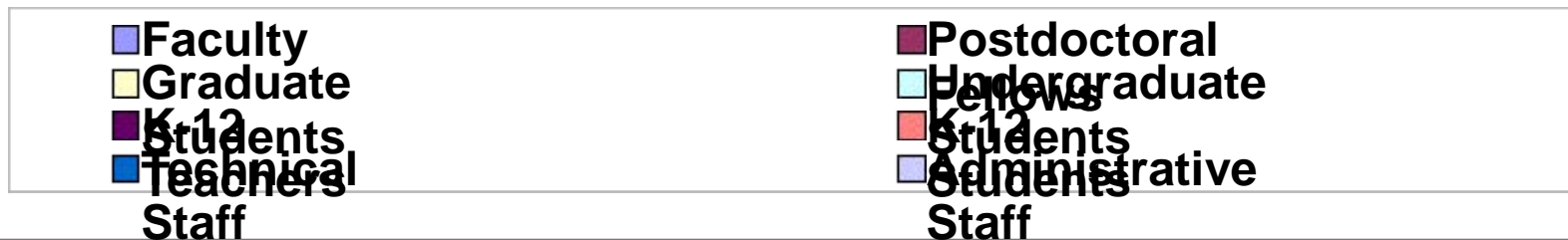
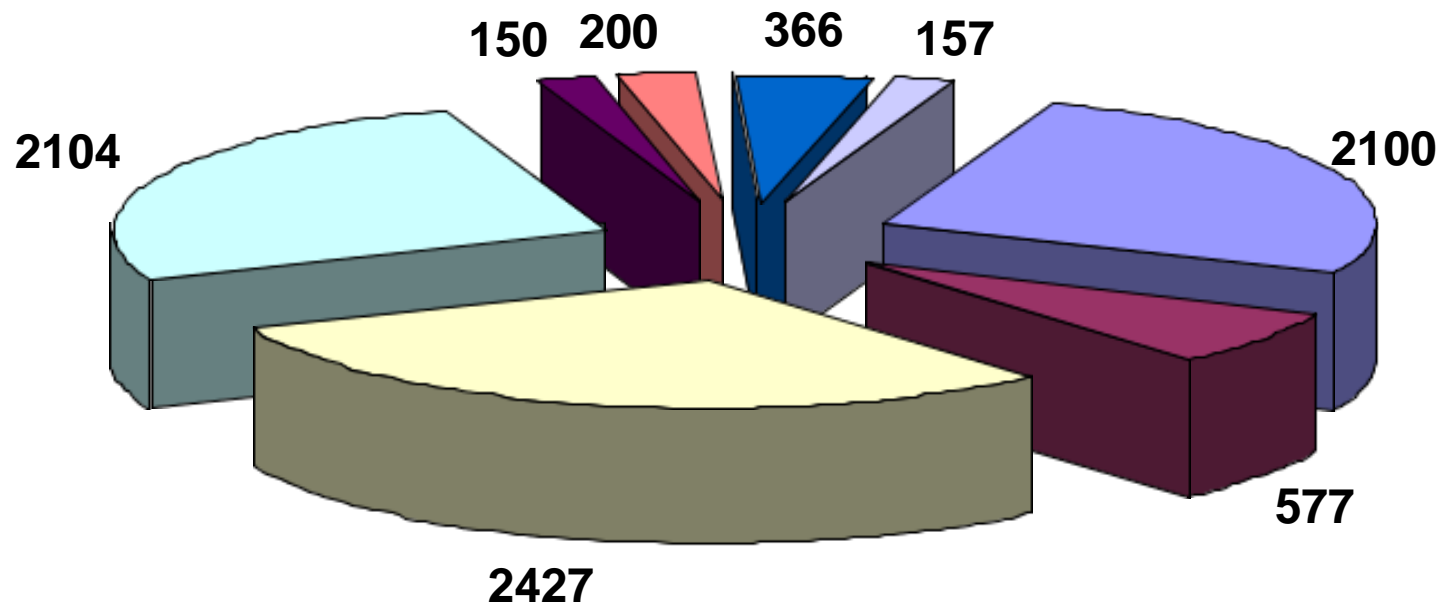
### Cross-Cutting Objectives

To Inspire and Transform

To Grow and Develop

Investment Priorities (by Strategic Goal)

# Distribution of People Funded by DMR in Materials Research & Education



**> 5,000 people used DMR-supported facilities in FY07**



How do we get  
there?

Different programs targeted at  
various  
activities and people in the  
NSF Directorates and Divisions  
Education and Outreach activities to  
engage  
students and teachers at all levels  
and general public

Outreach efforts aim at increasing  
science literacy of current and future  
citizens

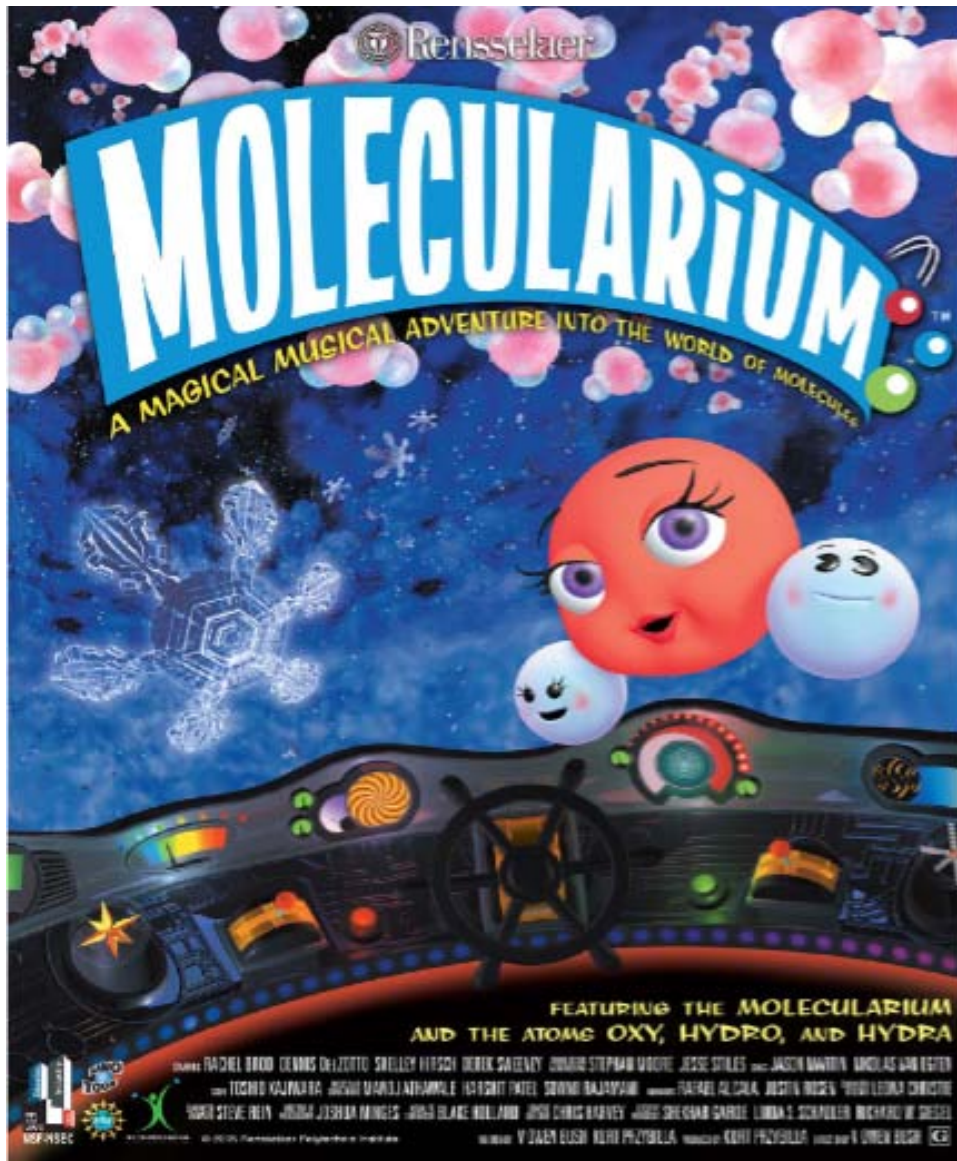
# NSF-MRSEC University of Maryland Highlight Thinking Small: Nanoscale Informal Science Education (NISE) Activities

Alex Prasertchoung, Education Coordinator

Donna Hammer, MRSEC Associate Director and Education Director

- **The University of Maryland (UMD) MRSEC** joined the NISE Network in the nation-wide effort to bring nanoscience to communities across the country during the week of March 29 - April 6, 2008.
- **Service-based:** The Maryland MRSEC uses a service-based approach to carry out its education outreach mission. This approach allowed 12 faculty, post docs, and graduate students to get involved with NISE and present research-related information to students within the context of sharing nanoscience demonstrations. MRSEC developed inspiring nano presentations, brought additional materials that complimented the NISE kit demonstrations, and gave real application to research projects going on at UMD.
- **Exciting Week of Activities: 1:** MRSEC researchers visited Oxon Hill High School's **Science and Technology Program** where they effectively engaged 90 students, 6 teachers, and 2 external education consultants in nanoscience presentations and demonstrations.
- **2:** Nine Ernest Just Middle School science teachers participated in MRSEC's **Nanoscience Teacher Workshop**, during which they received one-on-one instruction, lessons, and supplies.
- **3:** MRSEC members visited Berwyn Heights Elementary School where they involved 55 5th and 6th graders and 4 teachers in **nanoscience activities**.
- **4:** During the MRSEC **Nanoscience Open House**, researchers shared a nanoscience presentation and activities with homeschool families.
- **5:** Sligo Creek Elementary School families learned about the nanoworld at **Family Science Night** from MRSEC researchers.





**"If only one idea had to be passed on to the next generation, it is the concept of Atoms and Molecules, and that everything is made of them"** RICHARD P. FEYNMAN

New way to explore science and learn about atoms and molecules via "Digital Dome" experience

<http://www.molecularium.com/index.html>

features Kid's site, Teacher's Resource Guide offering educational tools that bring nanoscale universe to life.

Rensselaer Polytech. Inst.  
NSEC - DMR-0117792, 0642573