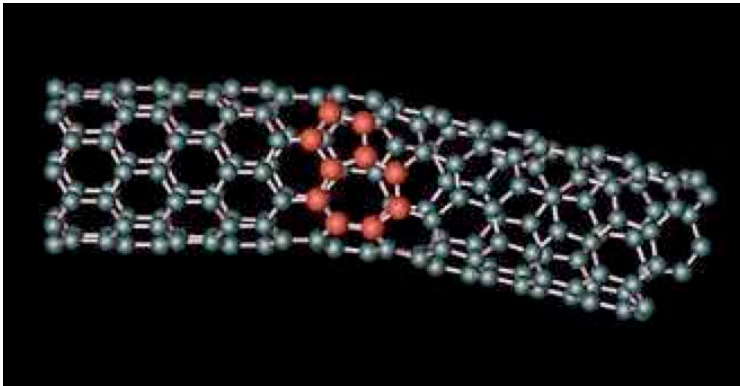
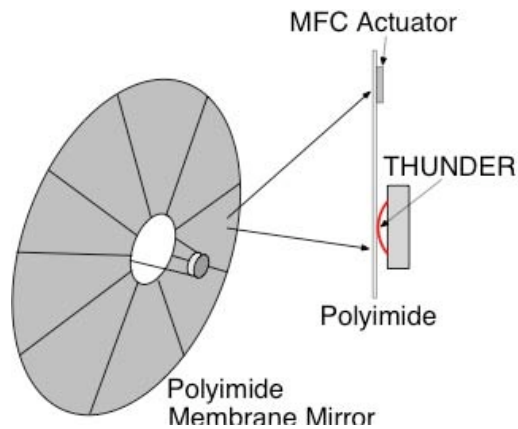


# Department of Mathematics Where We Are Today

**Ralph C. Smith**



**Carbon Nanotube Modeling**



**Graduate and Undergraduate Research**

# Who Are We?

## People:

- Faculty: 60
- Postdocs and Visitors: 10
- Graduate Students: 150
- Undergraduate Majors: 262

## Courses:

- Undergraduate: 54
- Graduate: 76

## Awards and Distinctions:

- Department ranked in top 5 for total research expenditures
- 2006 Departmental Award for Teaching and Learning Experience

**But ...** Numbers and awards do not tell the full story!



**Demetrio Labate:** NSF CAREER Award recipient in 2008



**Bob Martin:** Named an Alumni Distinguished Undergraduate Professor for 2008-2010



**Denise Seabrooks:** Nominated for a 2008 SPA Award for Excellence



**Nicole Kroeger:** Sophomore math major won a prestigious Barry M. Goldwater Scholarship for 2008-2009

# What Makes Our Department Highly Vibrant?

**One Answer:** Excellence in research, teaching, and the interaction between the two.

## Three R's of the Past:

- Reading, Riting and Rithmetic



## Three R's of NCSU Math:

- RTG: Research Training Group:  
(Mathematics of Materials)
- REU: Research Experience for Undergrads
- REG: Research for Early Graduate Students



# NSF-RTG: Mathematics of Materials

**Amount:** \$1,899,908

**Duration:** 5 years

**Present Support:** 1-2 Postdocs, 7 Graduate Students, 5 Undergrads

## Topics:

- **Multifunctional Materials**
- Orthopaedic Biomaterials
- Granular Materials and Thin Films
- Carbon Nanotube Infused Polymers
- Laser Welding

## Educational Components:

- 5 New Courses
- Research Training Modules: e.g., webdesign, interview strategies
- Student Seminars

**Details:** [http://www4.ncsu.edu/~mahaidar/NCSU\\_RTG\\_Site/RTG\\_Homepage.html](http://www4.ncsu.edu/~mahaidar/NCSU_RTG_Site/RTG_Homepage.html)



**Magnetic Loudspeaker**

# NSF-RTG: Mathematics of Materials

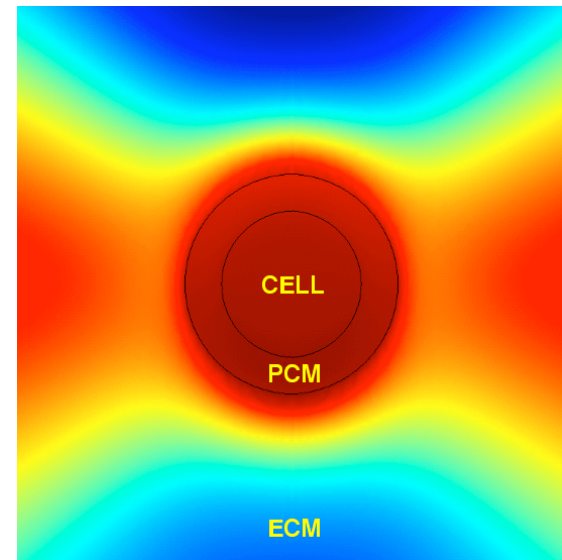
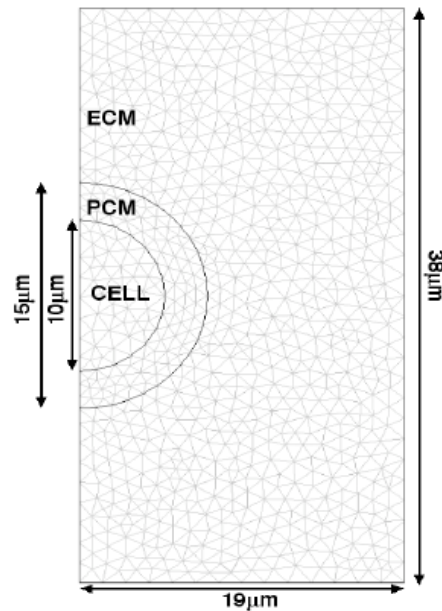
Faculty: Mansoor Haider

Collaborators: Duke Medical Center

Goals:

- Model the dynamic mechanical environment of articular cartilage
- Design optimal biocompatible scaffolds for cartilage repair

Scope Presentation: “Cartilage Regeneration”

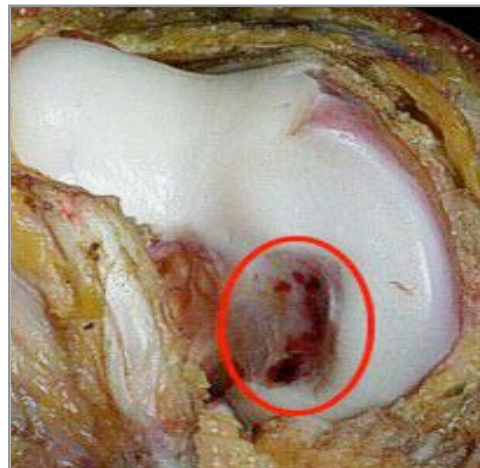
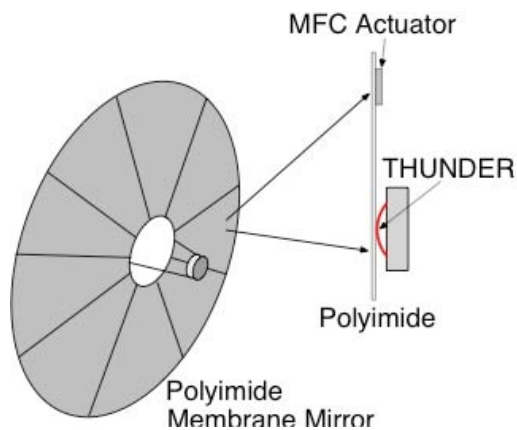
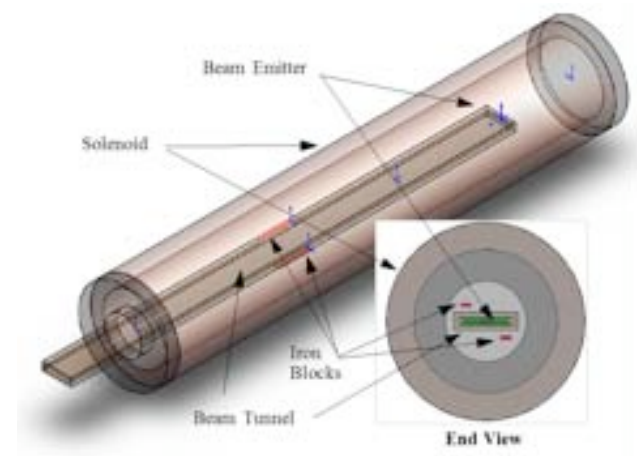


# REU: Research Experience for Undergrads

Initiated: 2005

1998 Projects: (Partial List from 10 Projects)

- Thermal Nondestructive Evaluation
- Information Retrieval and Web Search
- Electron Device Design
- Modeling of Traffic Congestion
- Modeling Cartilage Regeneration
- Multifunctional Materials



# Undergraduate Research

Joseph Briggs: Math/Economics Major

## Research Topic:

- Model development for the Platte Thistle
- Indigenous plant in midwest prairies
- Threatened with extinction in some areas
- Research initiated at Nebraska REU and continued at NCSU

## Related Coursework:

- Differential equations, linear algebra, optimization, numerical analysis, statistics, biology



# Statistical and Applied Mathematical Sciences Institute (SAMSI)

**Initiated:** 2002

**NSF-Funded Consortium:** NCSU, UNC, Duke, and NISS

**Driving Principle:** Promote research and educational opportunities at the intersection between mathematics and statistics.

## **Math Department Interaction:**

- 3 Associate Directors
- 3 Program Leaders
- 12 Faculty Releases
- 14 Grad Students
- Multiple postdocs

## **Recent Programs:**

- Financial Math
- Environmental Sensor Networks



## Concluding Remarks

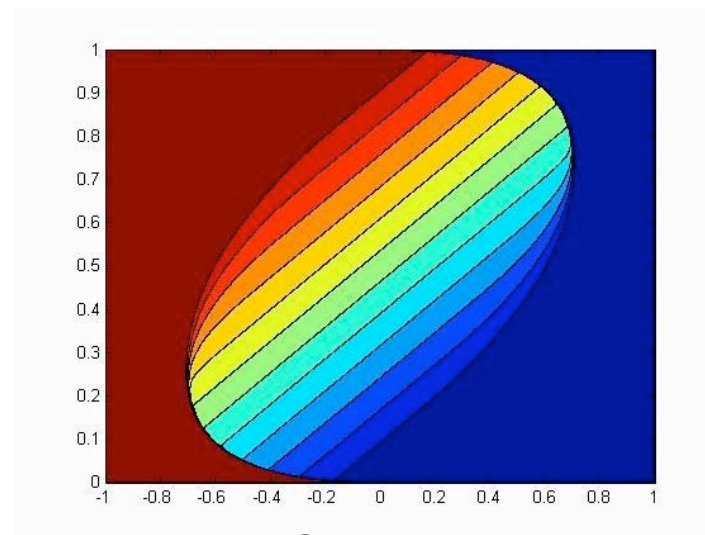
**2008 External Review:** Highly laudatory and commented on following:

- Engagement, energy and enthusiasm
- Shared vision of both applied and core mathematics
- Clear and determined commitment to education
- Department is leader both at NCSU and on national level

**Summary:** Synthesis between excellent research and teaching is creating a very exciting intellectual environment!



**2008 REU**



**RTG Program**