

Center for Nanotechnology Education Programs



Ethan Allen



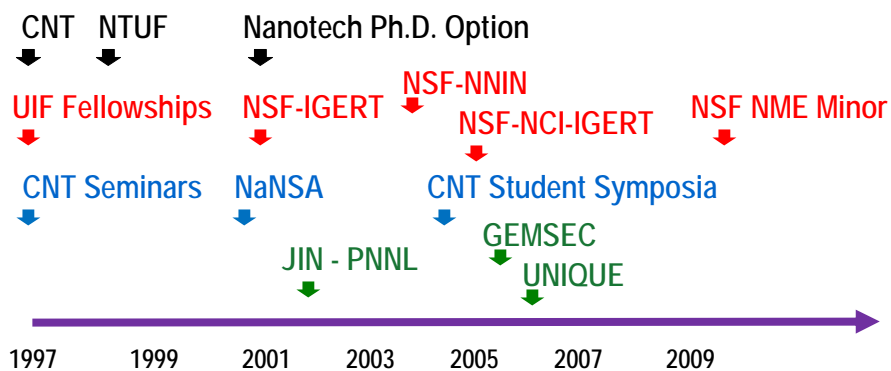
Manager, Education & Outreach, CNT



January 11, 2010

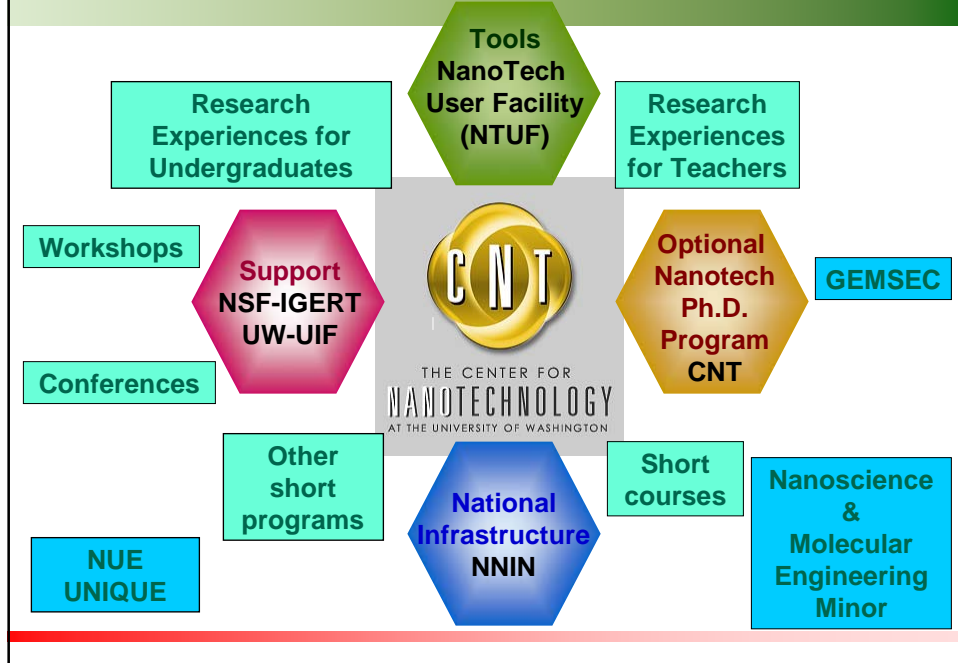


Nanotechnology Education at UW - History

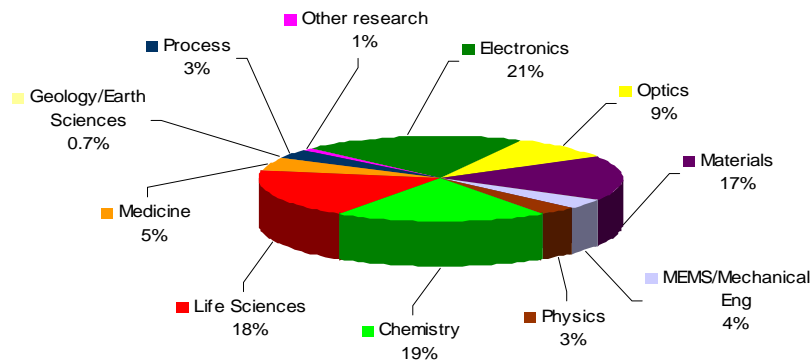


Center for Nanotechnology
- A Leader in Nanotech Education and Research

2. Nanotech Education at UW



Center for Nanotechnology Research Activities



- 4 UW Divisions spanning 14 Departments
- 85 UW faculty affiliated with CNT
- ~300 UW students in NaNSA

CNT & NTUF Publications



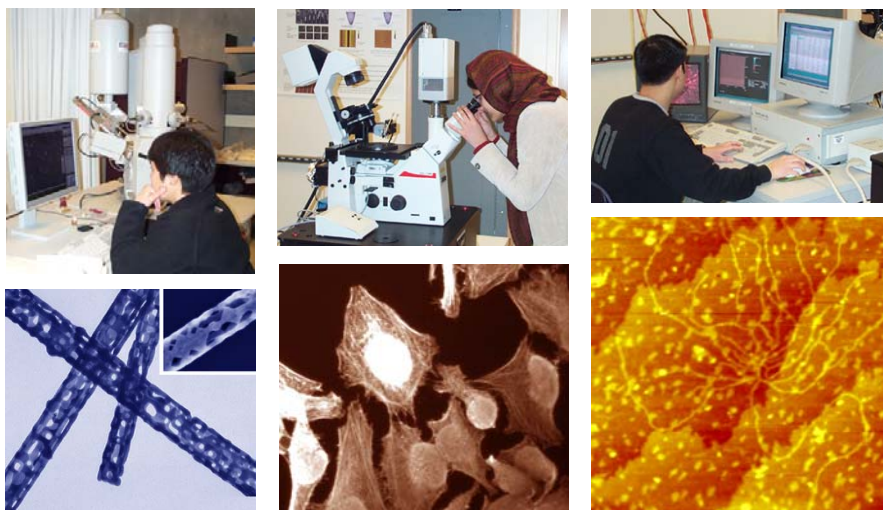
CNT & NTUF Publications since 2001 (as of 2/09):

Internal Users: Peer-reviewed journal articles - 151
Conference presentations - 96

External Users: Peer-reviewed journal articles - 13
Conference presentations - 1

Other major publications (books, short courses, etc.): 2

NanoTech User Facility



NTUF – Tool Inventory

Tecnai G2 F20 Scanning Transmission Electron Microscope
Veeco Dimension Scanning Probe Microscope 3100
Renishaw Raman Microscope
Zeiss LSM 510 NLO Confocal Microscope:
FEI Sirion Scanning Electron Microscope
Leica DMIRB Inverted Optical Microscope
Nanoscope III Scanning Probe Microscope

Additional Capabilities:

Soft Lithography
Electron-beam Lithography

Affiliated Facilities:

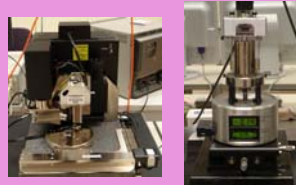
Microfabrication Lab at Washington Technology Center
Environmental Molec. Sci. Lab at Pacific Northwest National Labs

NTUF – Characterization



Optical,
Confocal, &
Raman

SEM, TEM, & STEM



Scanning Probe:
AFM, STM, MFM,
et al.

As well as both soft and e-beam lithography, the NTUF offers other fabrication options:

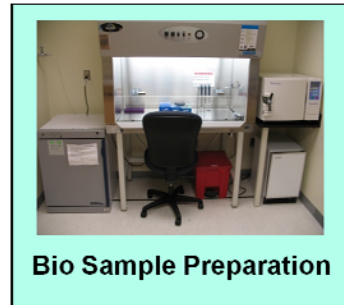


Atomic Layer Deposition (ALD) System



Surface Plasmon Resonance (SPR) Biosensor

And:



Bio Sample Preparation

Nanotech PhD option (“Dual Degree”)

Objectives:

- ❖ Provide students with both a *breadth* of nanotechnology background and *depth* of knowledge in a chosen discipline
- ❖ Catalyze a culture change in nanotechnology education that *transcends traditional disciplinary boundaries*

Participating UW Divisions & Departments:

Arts & Sciences

Chemistry
Physics

Engineering

BioE
ChemE
EE
MSE

Medicine

Biochemistry
Genome Sciences
Microbiology
Physiology & Biophysics

Structure for Optional Ph.D. Program

- ❖ Admission to one of the participating (“HOME”) departments
- ❖ Fulfillment of requirements from HOME DEPARTMENT
- ❖ Fulfillment of additional requirements for NANOTECHNOLOGY
 - CNT Seminars (4 qtrs; @ 1 credit)
 - Frontiers in Nanotechnology (3 credits)
 - Multidisciplinary Coursework (9 credits; 6 outside ‘home’)
 - Laboratory Rotation (Outside advisor’s ‘home’ - ~3 credits)
 - Research Thesis (CNT faculty advisor)
- ❖ Ph.D. in “HOME DEPARTMENT” and NANOTECHNOLOGY

First Ph.D. degree in nanotechnology in the nation

Nanotech Community - NaNSA

Nanotechnology and Nanoscience Student Association

Objectives:

Stimulate interactions among undergraduate and graduate students from different disciplines to promote cross disciplinary learning and research, provide a supportive community, and foster nanotechnology education programs at UW

Activities:

- ❖ Semi-monthly meetings
- ❖ Social gatherings
- ❖ Outreach activities
- ❖ Mentorship program

The first nanotech student association in the nation

Nanotech Community - CNT/NTUF Staff Team

❖ **Acting Director: Professor Francois Baneyx, PhD**



❖ Assistant to the Director: Mack Carter



❖ Fiscal Specialist: Sharon Li



❖ **NTUF Lab Manager: Alec Pakhomov, PhD (AFM)**



❖ Staff Scientist: Paul Wallace, PhD (Optical/Photolithography)



❖ Staff Scientist: Xiaoxia Gao, PhD (TEM)



❖ Staff Scientist: Scott Braswell (SEM)



❖ **Education Manager: Ethan Allen, PhD**

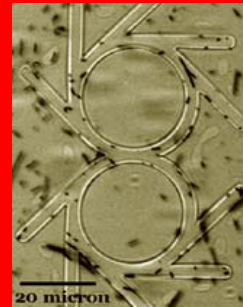
Nanotech Community - NNIN



National Nanotechnology Infrastructure Network
(2004 – 2009 supported by NSF)

Nanotech at the University of Washington

The Science of the Very Small is Getting Bigger in the Pacific Northwest



www.nano.washington.edu

Seattle, Washington