



Future and Legacy of NSEC Program.

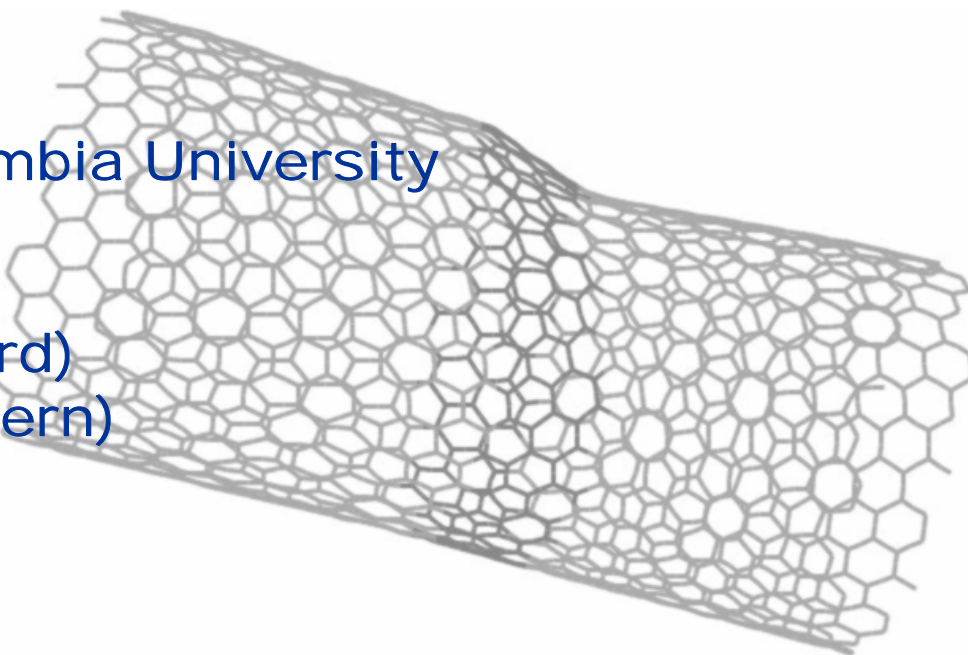
James T. Yardley, Columbia University

Dick Siegel (RPI)

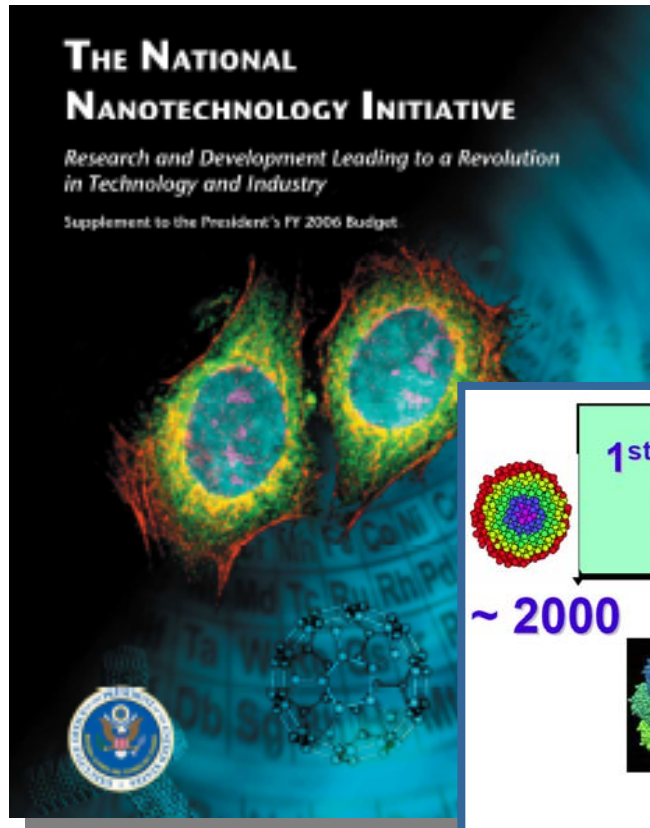
Placid Ferrera (Illinois)

Bob Westerweld (Harvard)

Chad Mirkin (Northwestern)

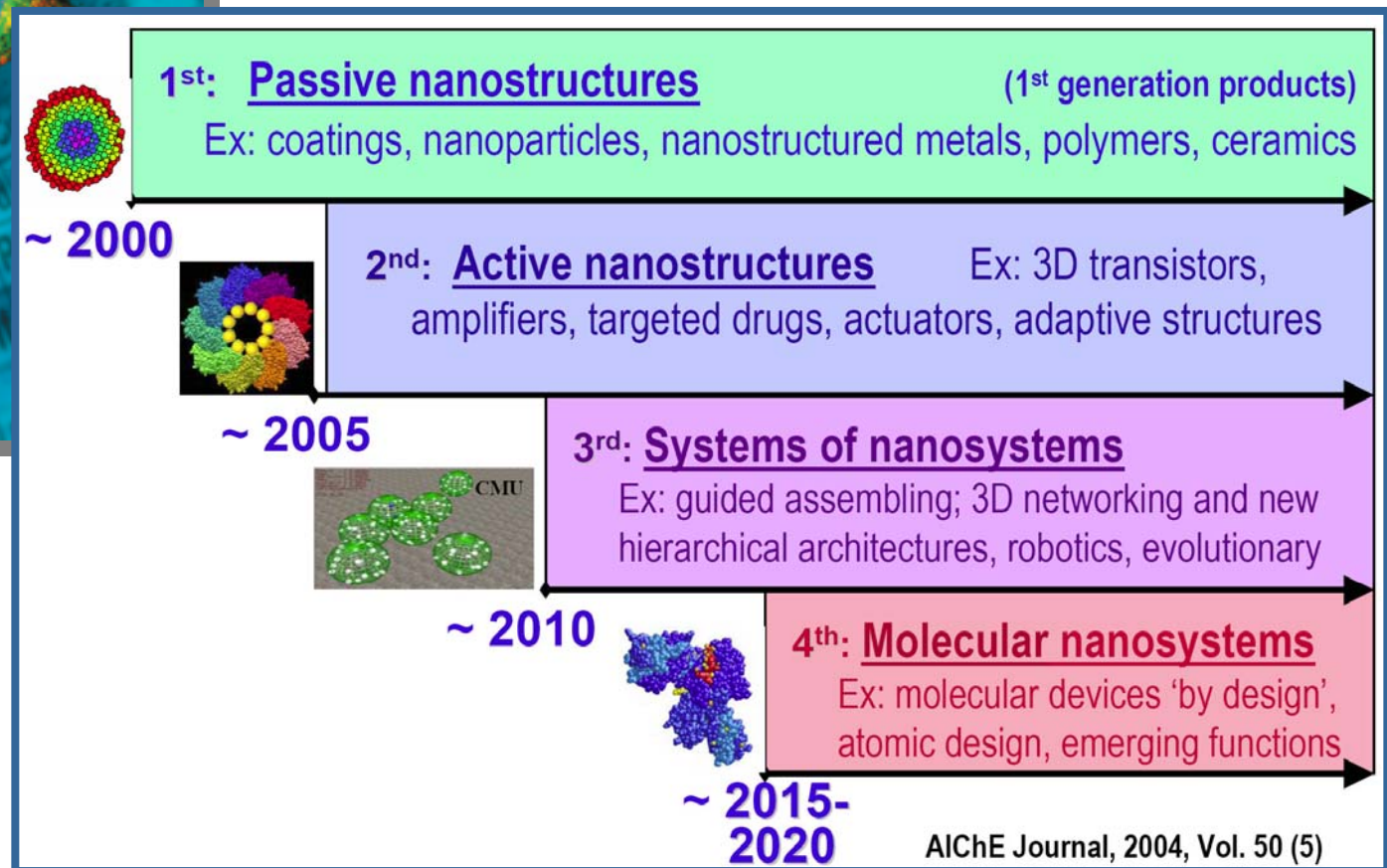


National Nanotechnology Initiative (NNI).



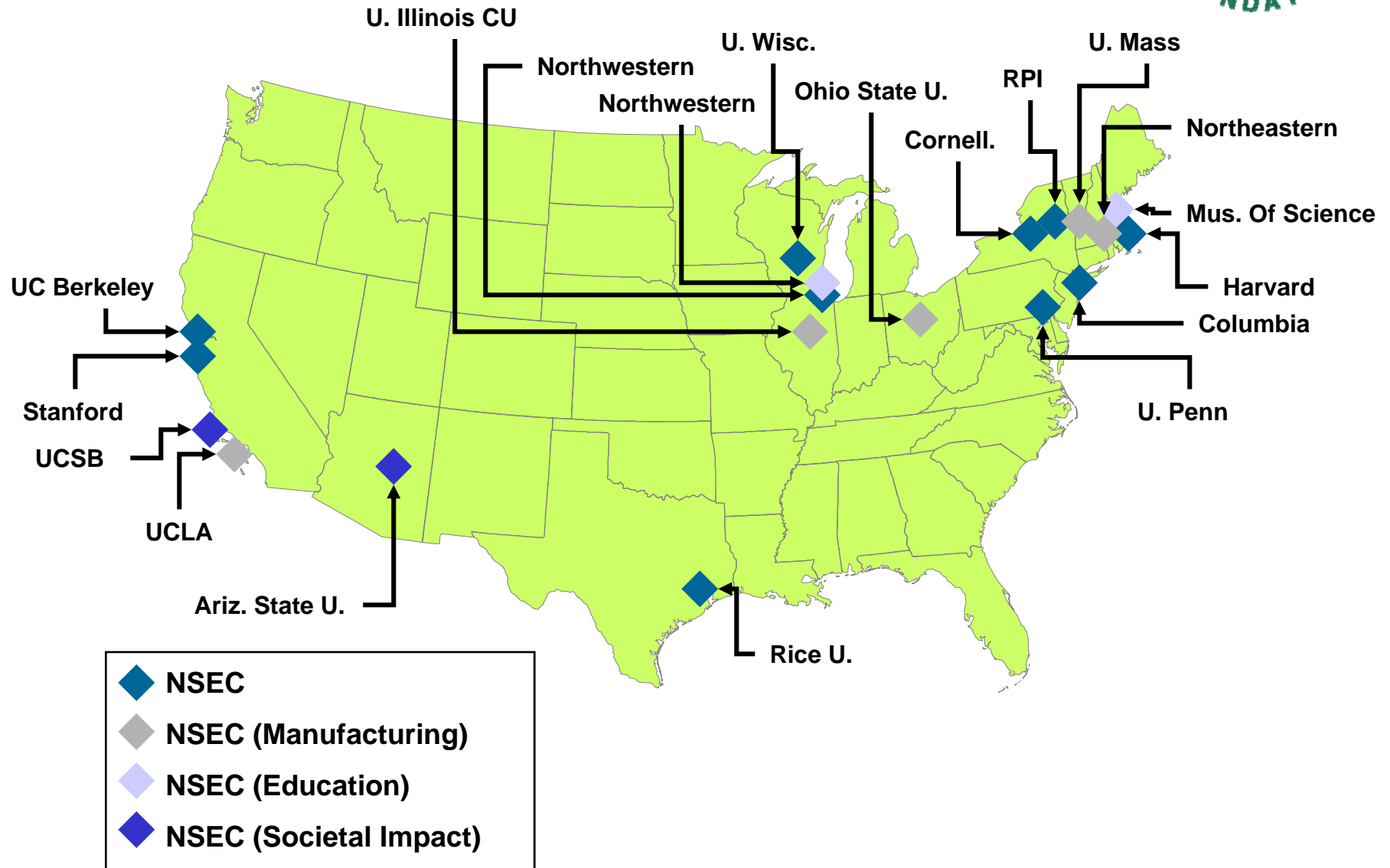
Genesis: White House Office of Science and Technology Policy....2000.

Development:
2000-2007,
NSF (Mike Roco).





NSF Nanoscale Science and Engineering Centers.





Creating New Science and Technology.



NSEC's are creating new paradigms for interdisciplinary research!

From NSF Committee of Visitors Review, 2004:

“Two significant and enduring results have emerged from this investment: .. the creation of a nanoscale science and engineering community, and the fostering of a strong culture of interdisciplinary research”



Providing Outreach and Education

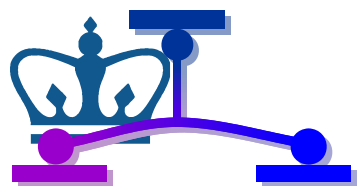


NSEC's are taking leadership in providing for outreach and education!

NanoDay in New York.



Bill Nye, "The Science Guy"



SHAKE HANDS WITH SCIENCE!

NanoDay in NEW YORK

AN ALL-DAY, CITY-WIDE SCIENCE AND ENGINEERING EXTRAVAGANZA DESIGNED TO INCREASE HIGH SCHOOL STUDENTS' AWARENESS OF NANOSCIENCE AND NANOTECHNOLOGY AND THE IMPORTANT ROLE THESE DISCIPLINES WILL PLAY IN THE FUTURE OF GLOBAL SOCIETY

A PRESENTATION OF THE COLUMBIA UNIVERSITY NANOCENTER AND THE CITY COLLEGE OF NEW YORK

Saturday, March 31, 2007

8:30AM - 1:00PM - Aaron Davis Hall
1:00PM - 3:00PM - The Great Hall
The City College of New York
135th Street and Convent Avenue
New York, NY 10031

NanoDay in New York is brought to you by the collaboration of Columbia University, the City College of New York, Barnard College, and Rowan University

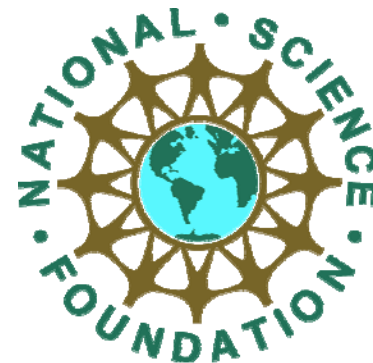
For more information about NanoDay in New York, please call (212) 854-3286

In association with NYSER

HIGHLIGHTS INCLUDE

- Featured Speakers
 - Professor Horst Stormer (Nobel Laureate, Physics)
 - Professor Vicki Colvin
 - Bill Nye the Science Guy
- An Expo featuring exhibits and demonstrations of cutting-edge science and research
- A chance to win prizes through a "Nano Raffle"

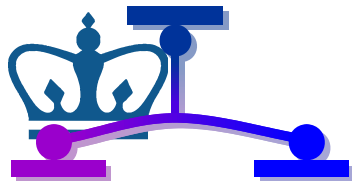
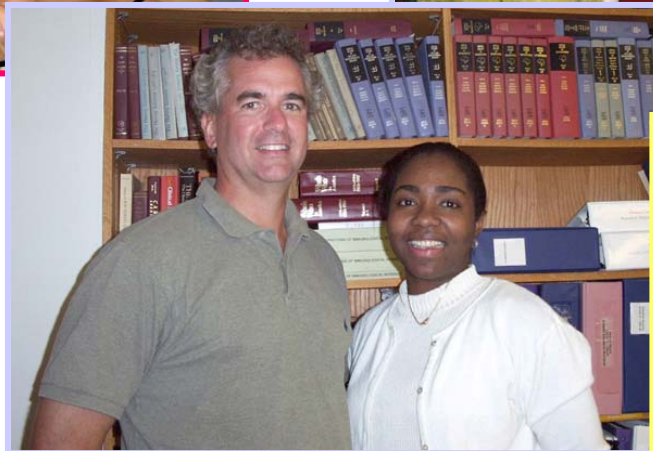
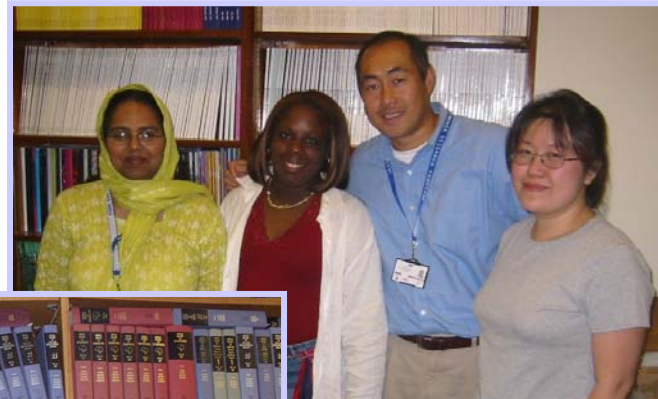
SPACE IS LIMITED ASK YOUR SCIENCE TEACHER HOW YOU CAN ATTEND NANODAY



Promoting Diversity.



NSEC's are actively building diversity within the new generation of scientists and engineers.





Protecting Health, Safety, and Environment.



NSEC's maintain active programs for health, safety, and environmental awareness.



NSEC Safety Course

Friday, April 29 - 1:00pm
Interschool Lab 7th Floor Schapiro/CEPSR

A pizza lunch will be served at 12:30pm



Jennifer Gardner
Industrial Hygienist, IBM

Jennifer Gardner is an Industrial Hygienist (IH) for IBM at the Watson Research Center located in Yorktown Heights, NY. Currently, her responsibilities include upstream chemical reviews, hazardous gas safety, asbestos, indoor air quality, quantitative and qualitative exposure assessments, contractor safety, noise, equipment review, and the IBM IH focal point for nanotechnology. Prior to working at the IBM Watson Research Center, Ms. Gardner worked as an IH at the IBM site in Hopewell Junction, NY.

Solvent Safety Do you know enough?

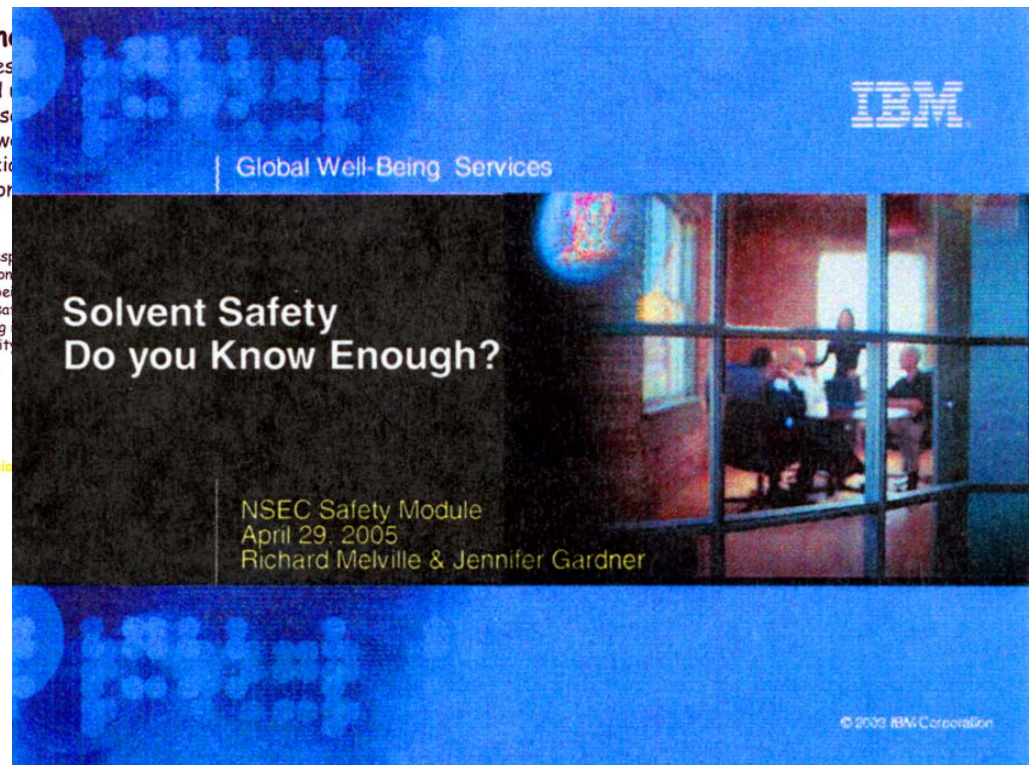
Nearly everyone is exposed to solvents. The utility of these dispersants, Or dilutants has lead to the manufacture and use of thousands of pounds annually. Exposures can occur in a broad range of settings from correction fluid, household cleaners, pumping gas and lab work. This course is designed to increase your awareness of the hazards associated with solvents based on their physical properties and toxicity. In addition, we will discuss measures used to minimize your exposure.



Richard Melville
Advisory Industrial Hygienist, IBM

Richard Melville is Advisory Industrial Hygienist for IBM in Hopewell Junction, NY. His responsibilities include upstream chemical reviews, regulatory compliance, asbestos, lasers, ergonomics support, hazard communication, and chemical security support. He is also the Global Well-being expert for asbestos and was previously the technical standard owner for chemical safety. In 1995, Mr. Melville was a senior project manager with Con-Test Water and Air Engineering. Mr. Melville received an M.S. in occupational and environmental hygiene from New York University. He has a comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.

Questions about the workshop can be directed to Kristen Gallagher at kg2161@columbia.edu



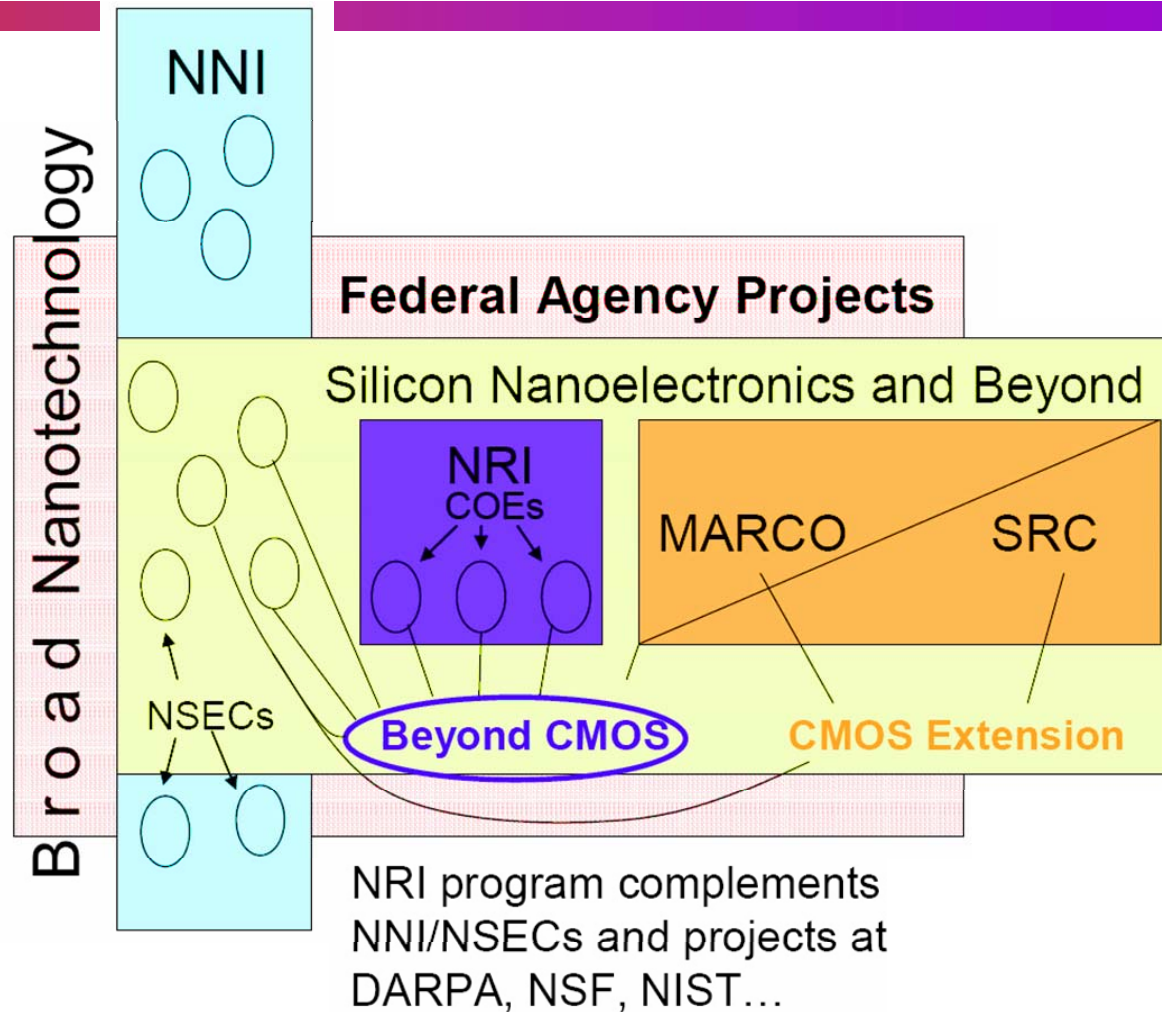


Creating Positive Societal Impact.



The Semiconductor Industry Association's NRI Member Companies

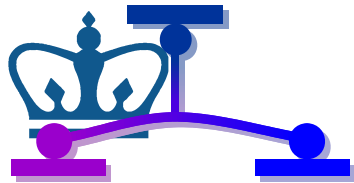
- IBM
- Freescale (Motorola)
- TI
- AMD
- Micron
- Intel



Quantum Coherent Transport in 1-D Materials



Providing Leadership in Scientific Research.



The Columbia Nanocenter: Research Team.



Chemistry

Ronald Breslow
Louis Brus
George Flynn
Richard Friesner
Ann McDermott
Colin Nuckolls
David Reichman

Mechanical Engineering

James Hone

Electrical Engineering

Tony Heinz
James Yardley

Applied Physics

Irving Herman
Stephen O'Brien
Aron Pinczuk

Physics

Philip Kim
Andrew Millis
Horst Stormer

Research Scientists:

Shalom Wind
Mark Hybertsen (BNL)
Mike Steigerwald (MRSEC)
Latha Venkataraman

O-E-D Consortium



Daniel Akins

BARNARD

Sally Chapman *
Jacob Alexander *



Robert Krchnavek

NSEC Encompasses
Approx. 75 Researchers
Including Graduate
Students And Postdocs.



Norton Lang
Paul Solomon
Tom Theis (Adv Bd)



Christian Kloc
David Lang



Graciela Blanchet
Ming Zheng
Ed Wasserman (Adv Bd)



Kevin Smith.
G. Thompson (Adv Bd)



Chuck Black
Mark Hybertsen
Jim Misewich
Ben Ocko
Yumei Zhu



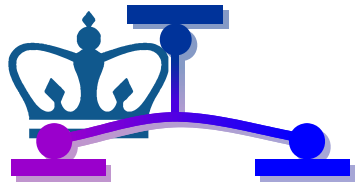
Molecular FOUNDRY
A NANOSTRUCTURES USER LABORATORY

Steven Louie



Muhammad Alam

* acting



Research Program: Seeking Fundamental knowledge.



Research Platforms

- Chemical Synthesis.
- Nanoscale Fabrication.
- Theory.
- Structural Characterization.
- Optical Characterization.
- Transport Measurement.

**Key
Scientific
Issues**

**Molecular
Contact and
Conduction**

**Nanoscale
Assembly**

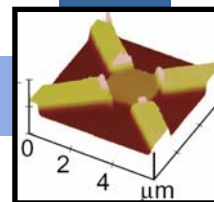
**Nanoscale
Characterization**

Molecular Nano-Systems

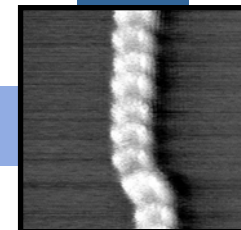
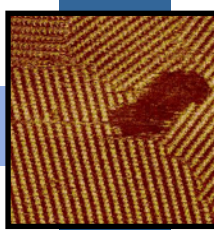
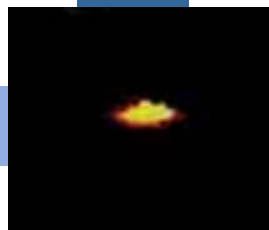
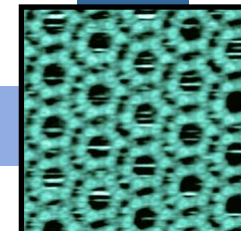
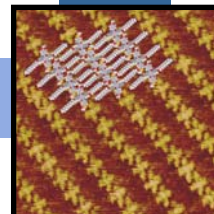
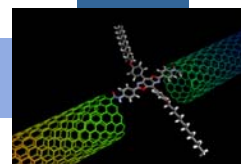
**Carbon
Nanotubes**



**2-D Nano
Structures**



**Single
Molecules**







The Future.

??????



- **Some new directions for Scientific Research building upon NSEC legacy:**
 - **Information processing..."beyond CMOS"**
 - **Energy**
 - **Bio-Nano-Medicine**
- **Independently Funded Centers**
 - **Sources of funding?**