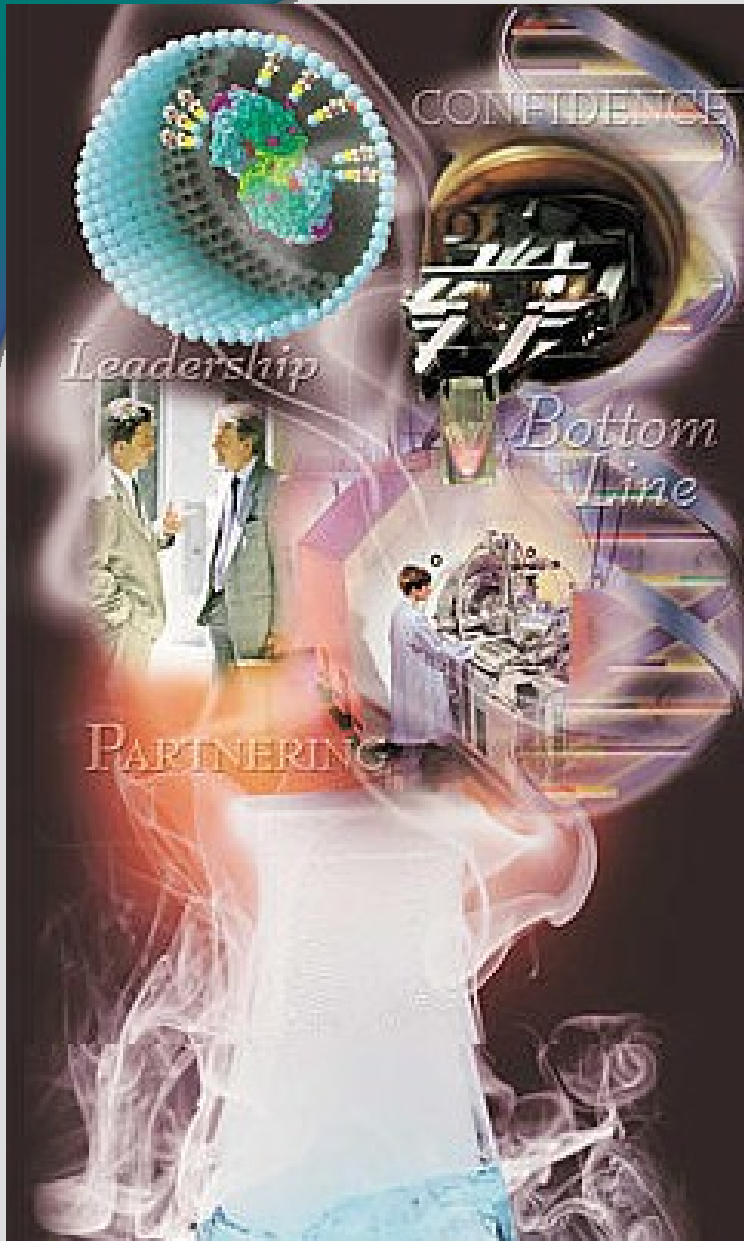


# Welcome to the Micro Nano Breakthrough Conference

Accelerating Discovery  
to Commercialization

**Dr. Len Peters**  
Director  
Pacific Northwest National Laboratory

July 28, 2004



# Micro Nano Breakthrough Conference

A progressive atmosphere for discussing science and technology challenges

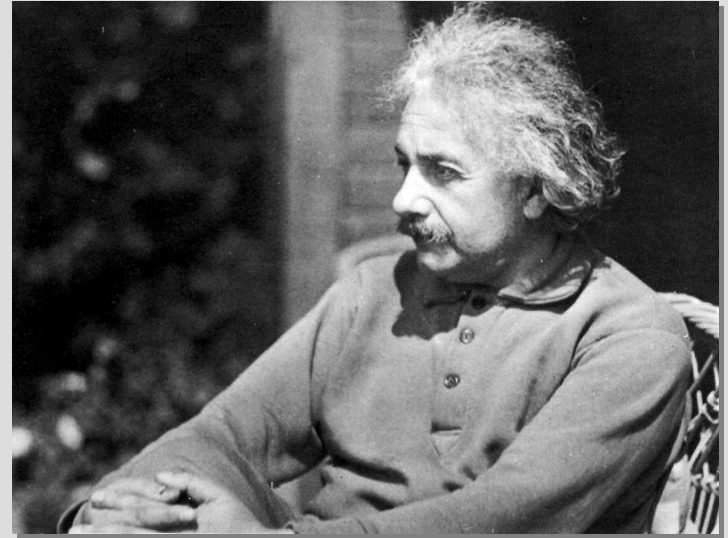
involved in moving discoveries from the lab to the marketplace

to enhance the economic vitality of our region

# Imagination

*“Imagination is more important than knowledge. . .”*

**Albert Einstein**



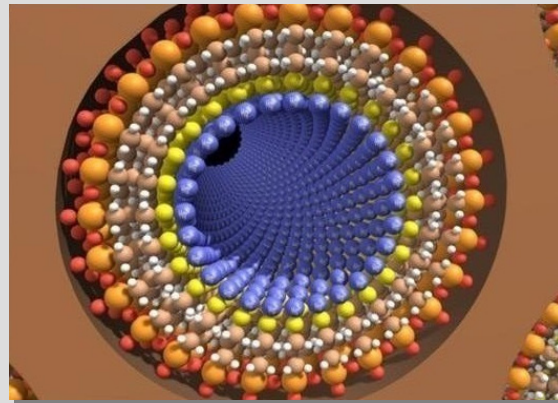
*“Why cannot we write the entire 24 volumes of the Encyclopedia Brittanica on the head of a pin?”*

**Richard P. Feynman**

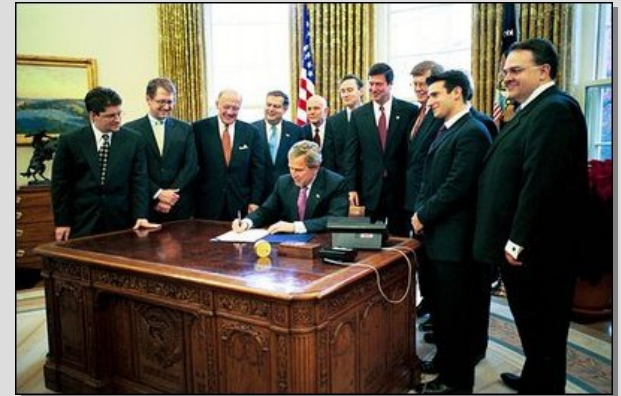
# Advances in microtechnology and nanotechnology have been visible and impactful...



...in business



...in fields of science



...and in shaping our Nation's R&D agenda

# The 21st Century Nanotechnology R&D Act will spur science to solutions

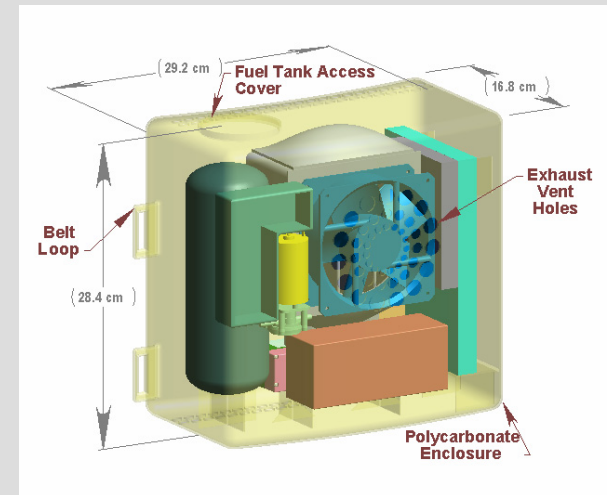
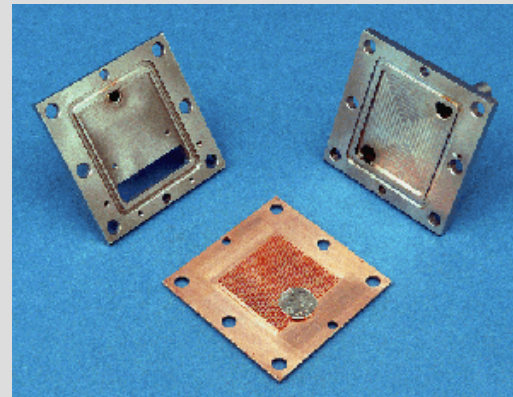
Basic



Applied



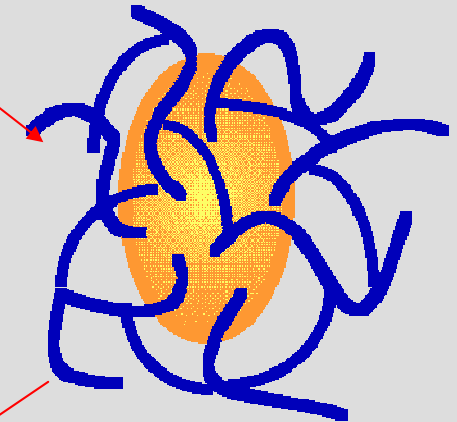
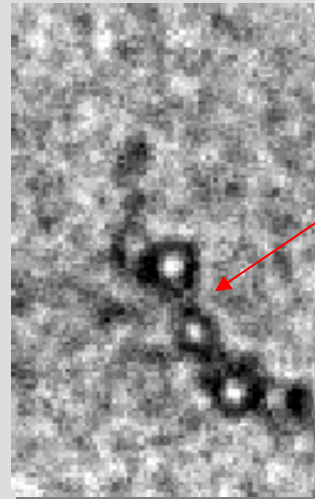
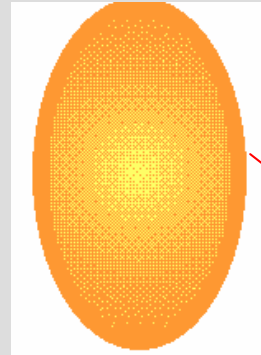
Development



Applications & Deployment

# “Methuselah” Enzymes

- ▶ Protecting enzymes with a nanostructure “cage”
- ▶ Increases enzyme life
- ▶ Potential applications
  - Biosensing
  - Waste cleanup
  - Environmental and life sciences



Single-enzyme nanoparticles remain active for longer periods thanks to their protective caging

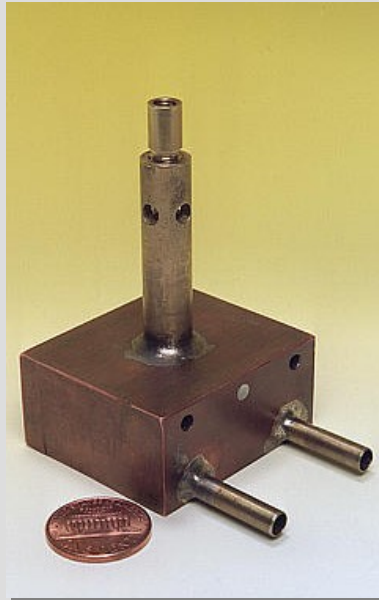
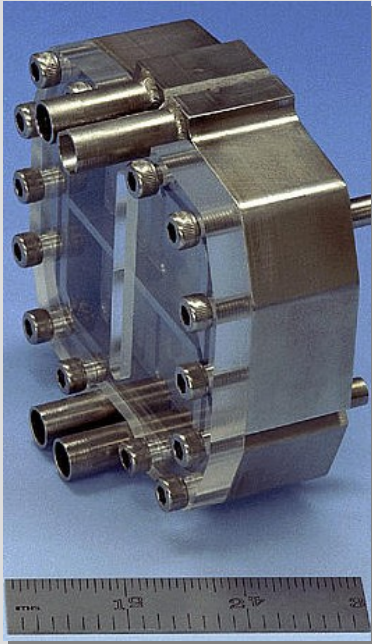


# Self-Assembled Monolayers on Mesoporous Supports (SAMMS)

- ▶ Single layers of molecules, tethered within pores of ceramic material; free ends attract and bond with metals
- ▶ PNNL and industrial partner test SAMMS on low-volume waste streams
- ▶ New nanoporous material may provide solution for nuclear waste storage



# Microtechnology at PNNL



- ▶ PNNL expertise has led to miniaturized components for various applications
- ▶ Compact Microchannel Fuel Vaporizer and MicroHeater win R&D 100 Awards in '99
- ▶ Battelle/PNNL developments lead to creation of Velocys in '01



# Partnering in the Great Northwest

- ▶ Collaboration accelerates commercialization process
- ▶ PNNL is committed to partnering in the Northwest

