



The 1st subject  
(Synthesis)  
Formation and Control of  
Nanotubes and Nanostructured  
Composites

The 2nd subject  
(Theory)  
Quantum Nano-physics

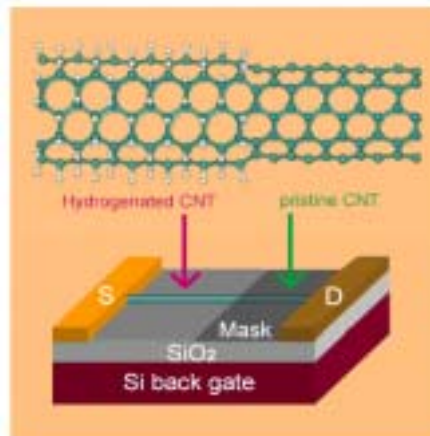
Center for Nanotubes and  
Nanostructured Composites

The 3rd subject  
(Application)  
Reactivity and application  
of nanostructures



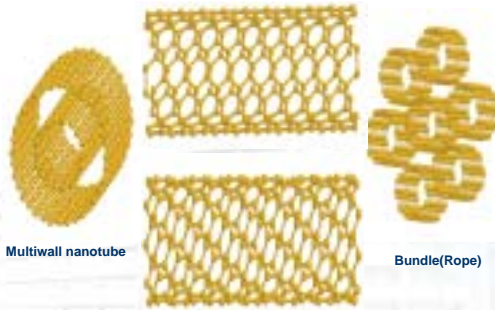
- 17 professors and research groups (7 from physics, 7 from chemistry, 3 from materials sci.)
- 3 research fellows, 10 postdoc, 125 graduates
- International cooperation ; U. Texas-Austin, U. North Carolina, Hong Kong Inst. Sci. Tech. NEC, Stanford U., UC-Berkeley, CERN Switzerland
- Industrial cooperation ; Samsung, Iljin Nanotech.
- Annal support : US\$ 1.5 M (0.9 M from KOSEF, 0.5 M from SKKU, 0.1 M from Industry)

### CNT arrays / AAO Template Modification of CNT



## Carbon Nanotubes (CNT)

Armchair (5,5) single-wall nanotube : *metallic*

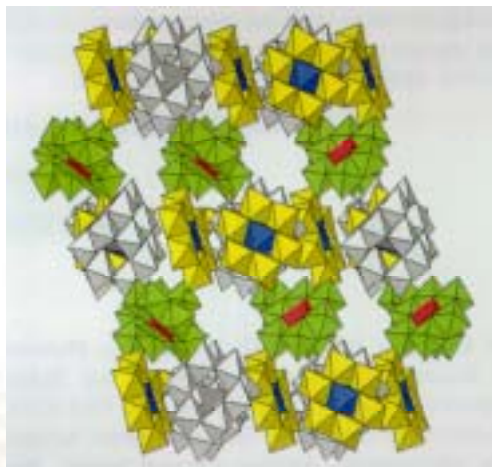


Multiwall nanotube

Bundle(Rope)

Zigzag (9,0) single-wall nanotube : *semiconducting*

## New Inorganic Nanoclusters



### ZnO Nanowires

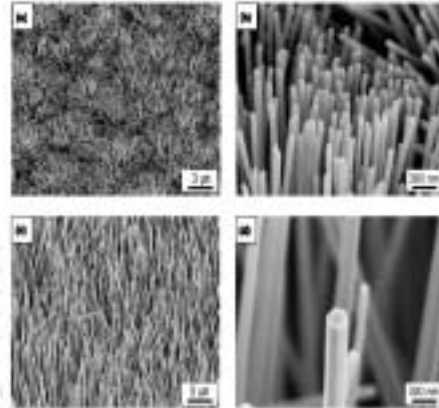
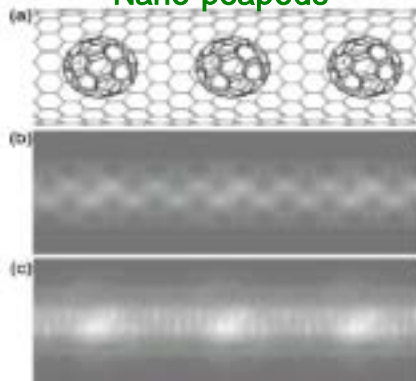


Fig. 2 SEM micrographs of ZnO nanowires: (a) dense forest of ZnO nanowires grown at 450 °C for a duration of 10 min; (b) single ZnO nanowire; (c) ZnO nanowire; (d) cross-section of ZnO nanowire.

### Nano peapods



**The 1st Era**

**2001**

2001. 7. Begin as KOSEF-funded Center  
2001. 9. Moved into new Research Plaza

**2002**

2002. 1. Hosted 2002 International Workshop on  
Nanotubes and Nanostructured  
Composites

**2003**

2003. 7. Hosted NT03

**Setup Infrastructures**

(SEM, HR-TEM-EDS, SPM, Raman, etc)

Grow new nanostructures.

Find new properties.

Control their formation.

Over 100 publications, 36 patents

**The 2nd Era**

**2004**

**2005**

**2006**

**World-class center**

Cooperate and exchange

**The 3rd Era**

**2007**

**2008**

**2009**

**Leads Nano Technology**

Find applications