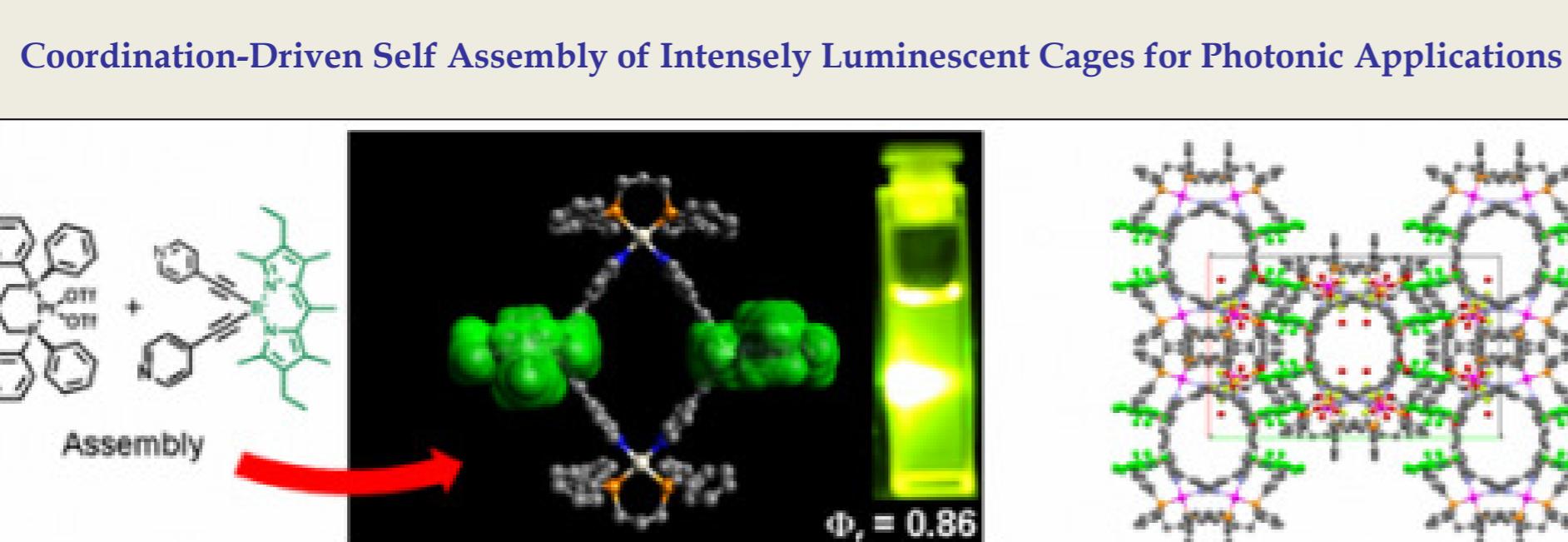


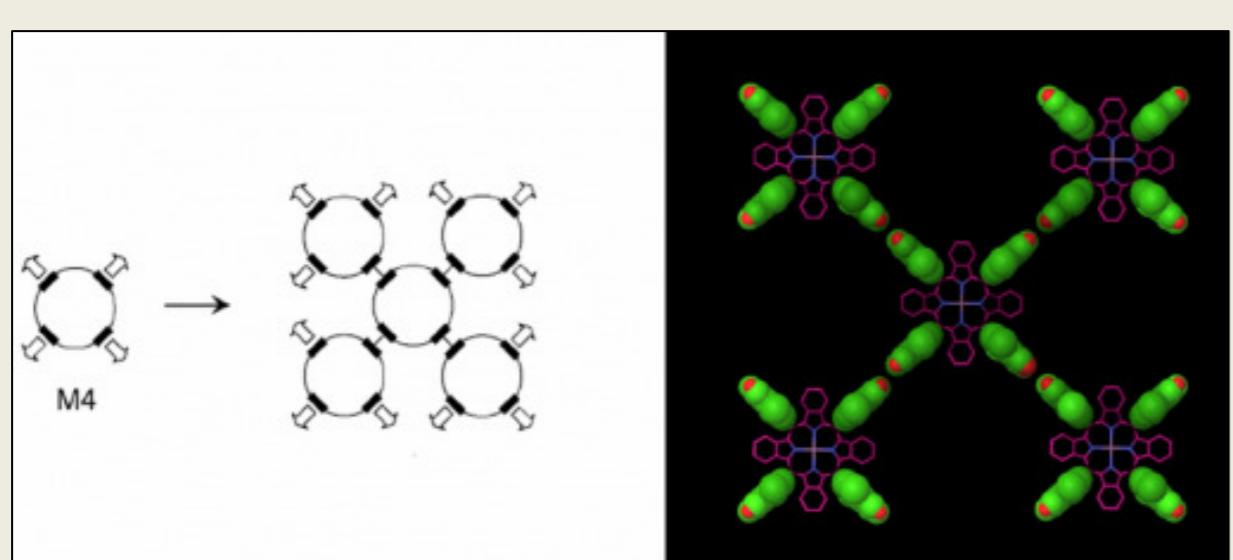
### Membranes & Advanced Nanostructured Materials : Characterization, Modelling & Processing

#### From molecular design to advanced nanostructures

##### ESL

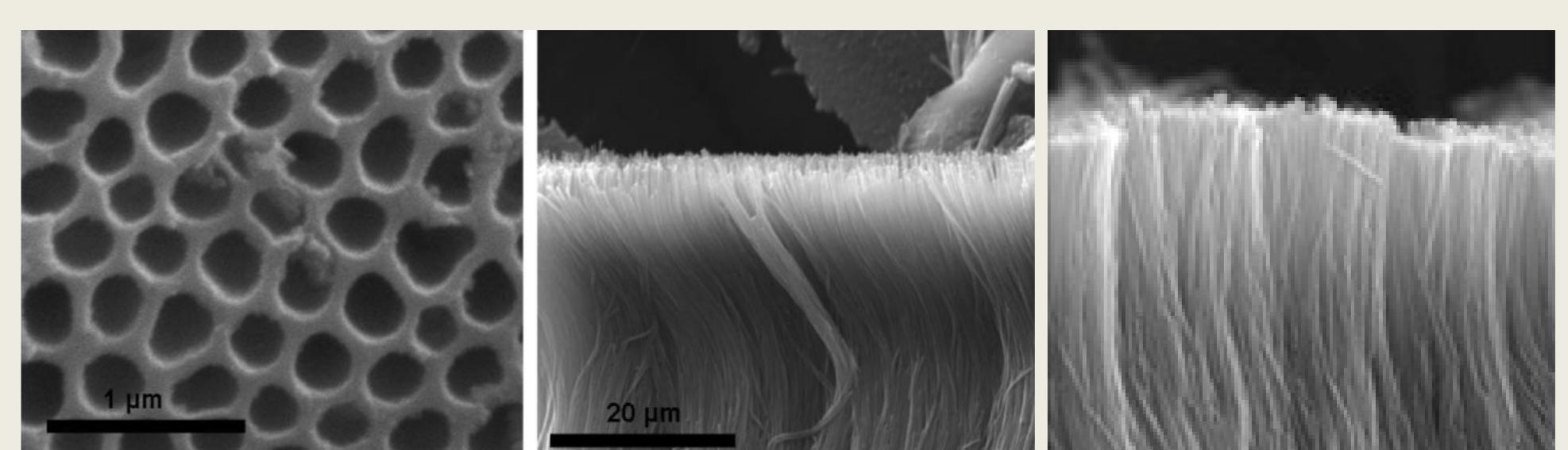


Rigid 2D self-assembled molecular network between properly designed light active subunits (sensitizers - emitters).



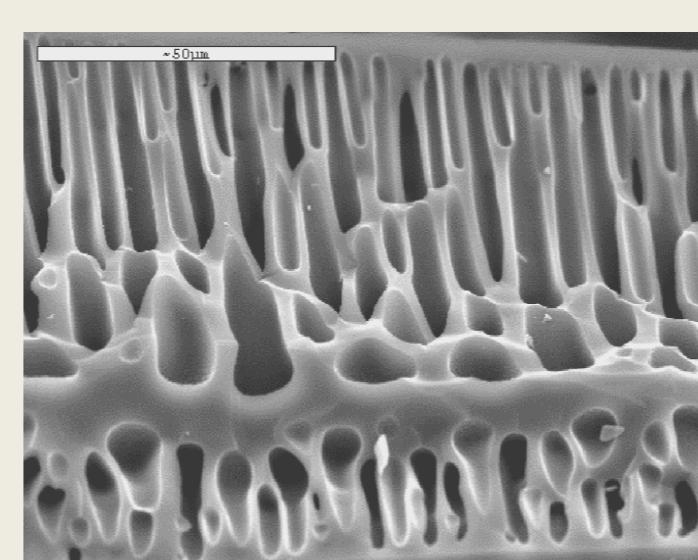
##### MESL

Anodized alumina membrane

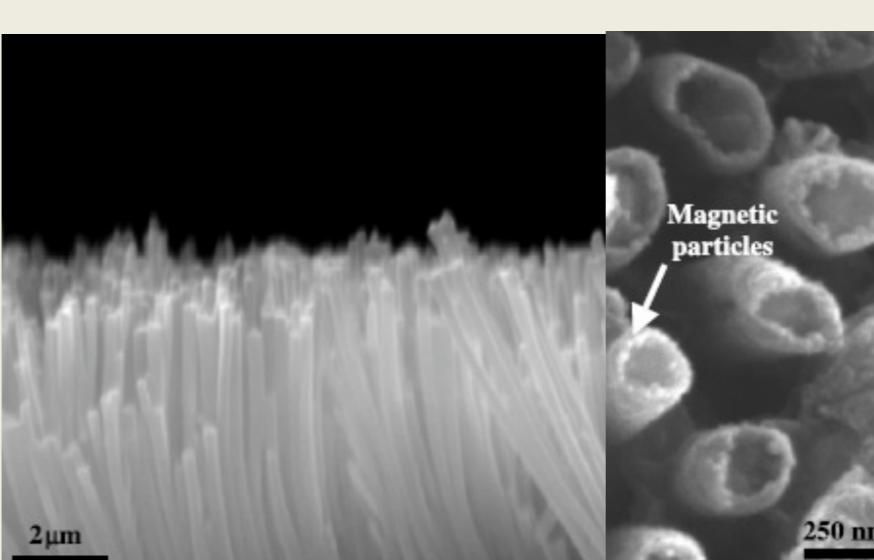


Aligned CNTs

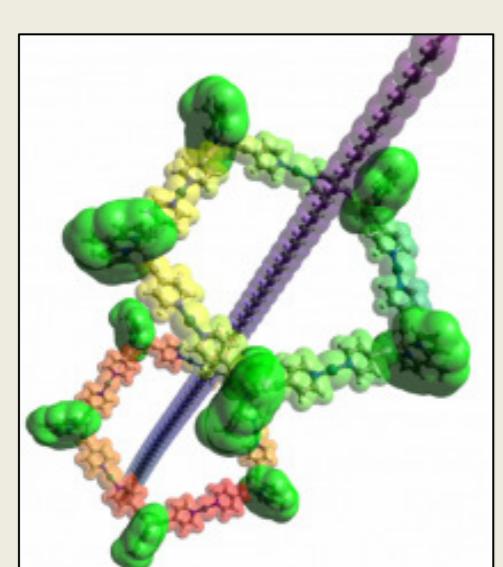
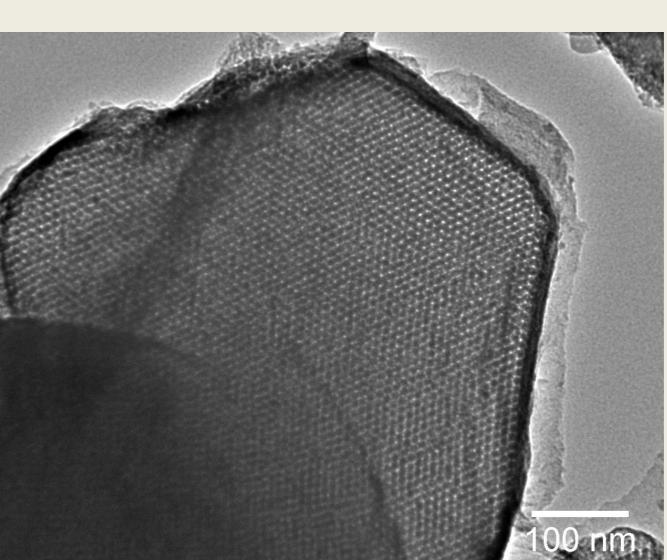
##### Asymmetric hollow fiber membrane



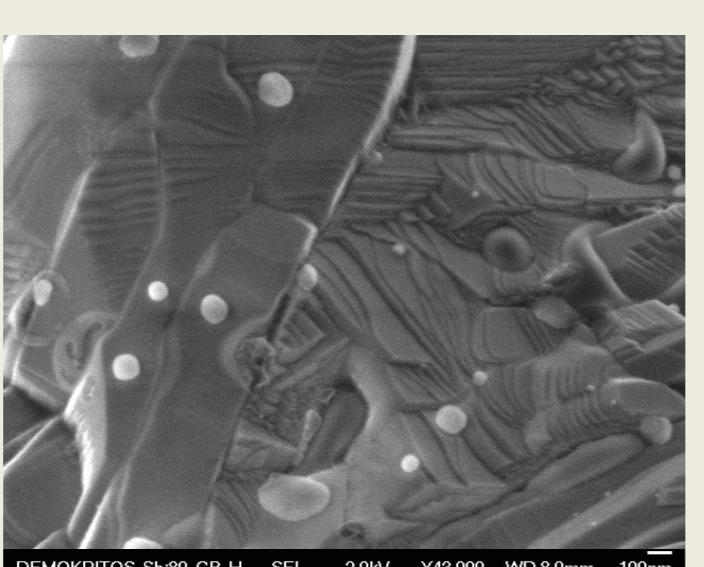
##### Magnetic CNTs



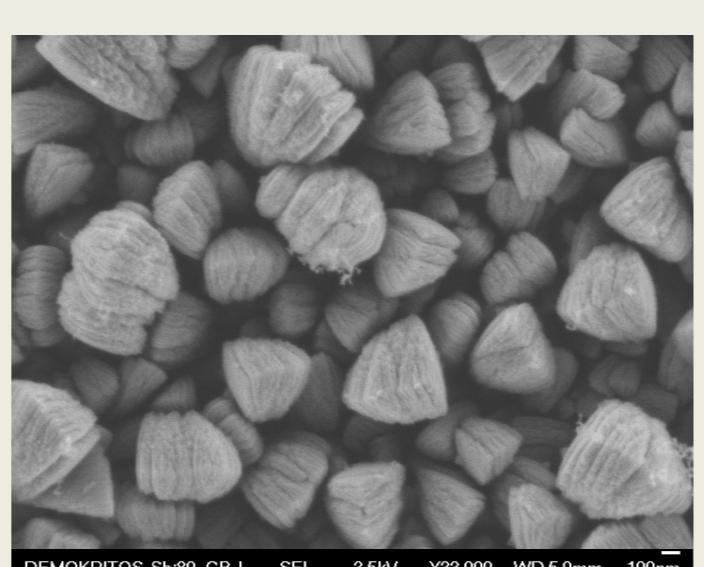
##### Ordered mesoporous carbon



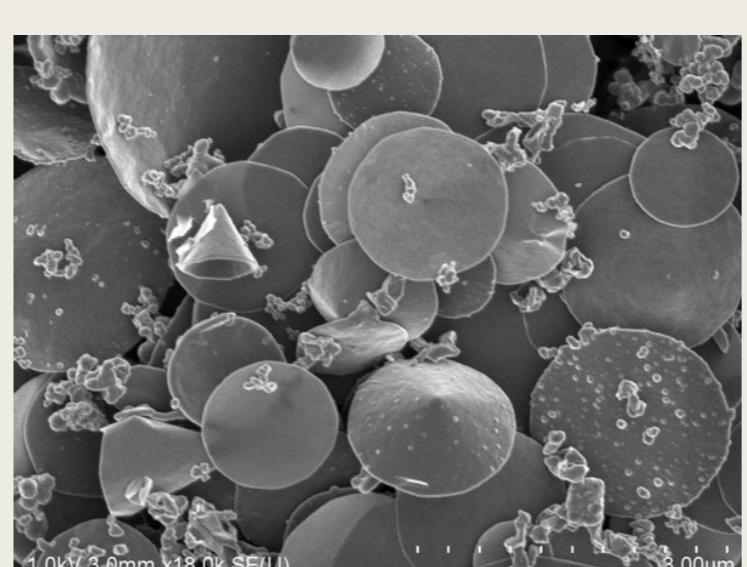
Encapsulation of a rodlike guest within threaded fluorescent cavatands



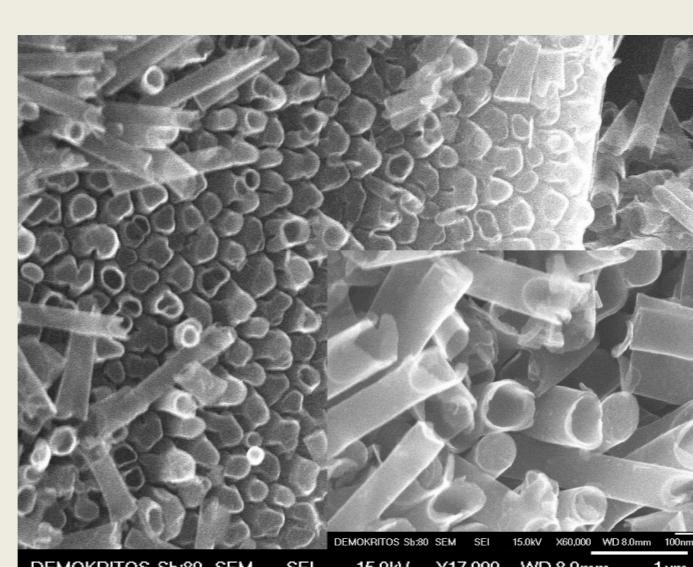
SiC



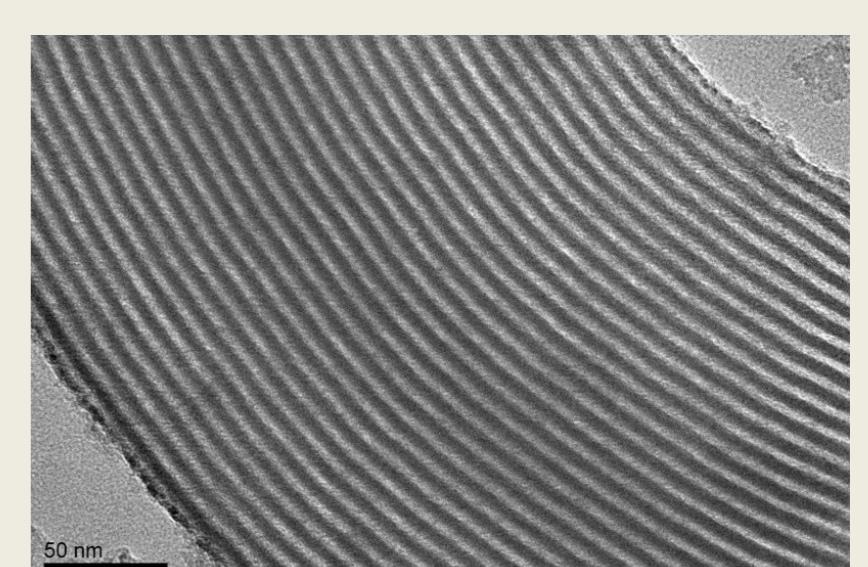
TiO<sub>2</sub> nanostructured particles



Carbon cones



TiO<sub>2</sub> nanotubes

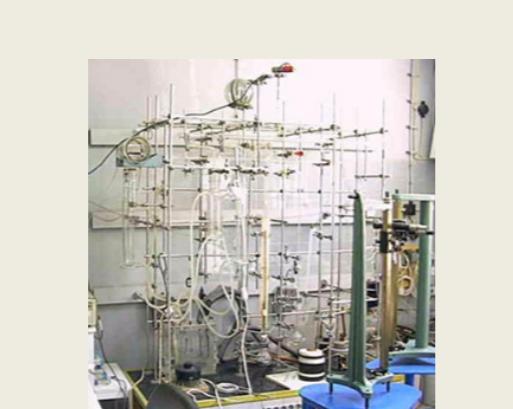
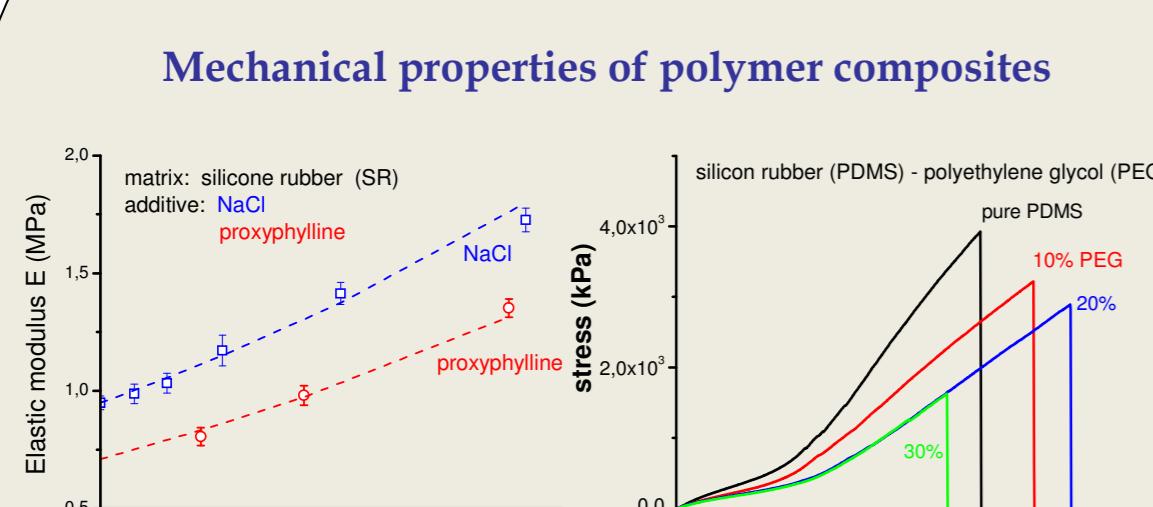


Ordered mesoporous silica

#### Physicochemical Characterization

##### TMPP

##### MESL



Mechanical properties of polymer films

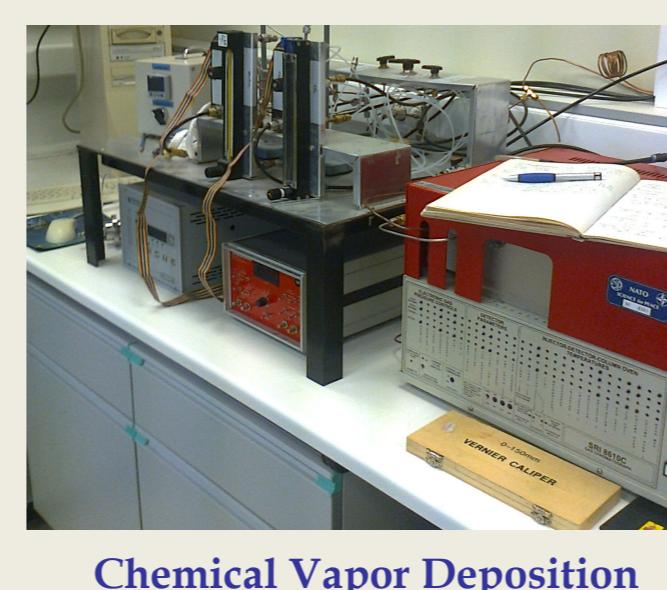


Dissolution tester of drug controlled release devices

Adsorption devices



Oxygen permeability apparatus

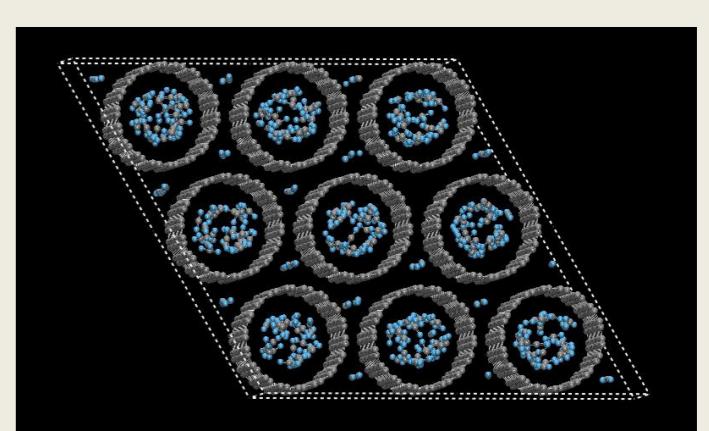


Field Emission SEM

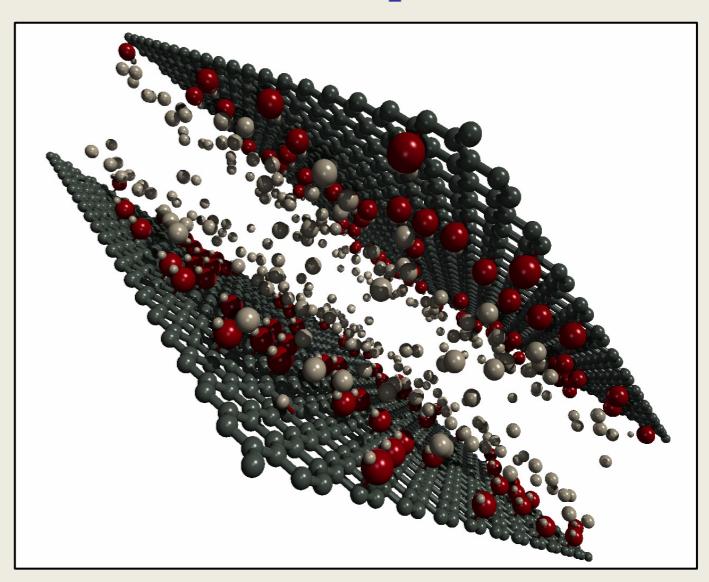
Chemical Vapor Deposition set-up

#### Modelling - Simulation

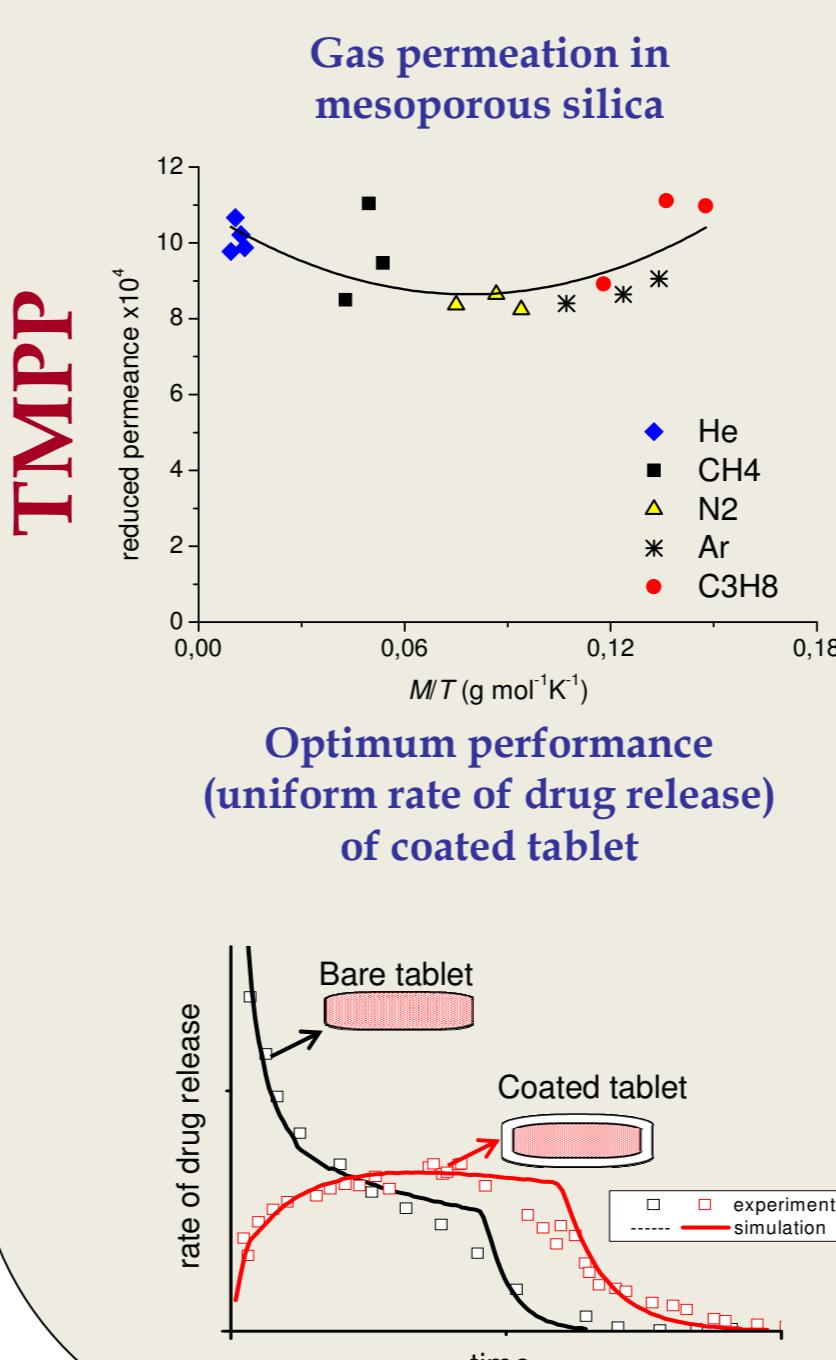
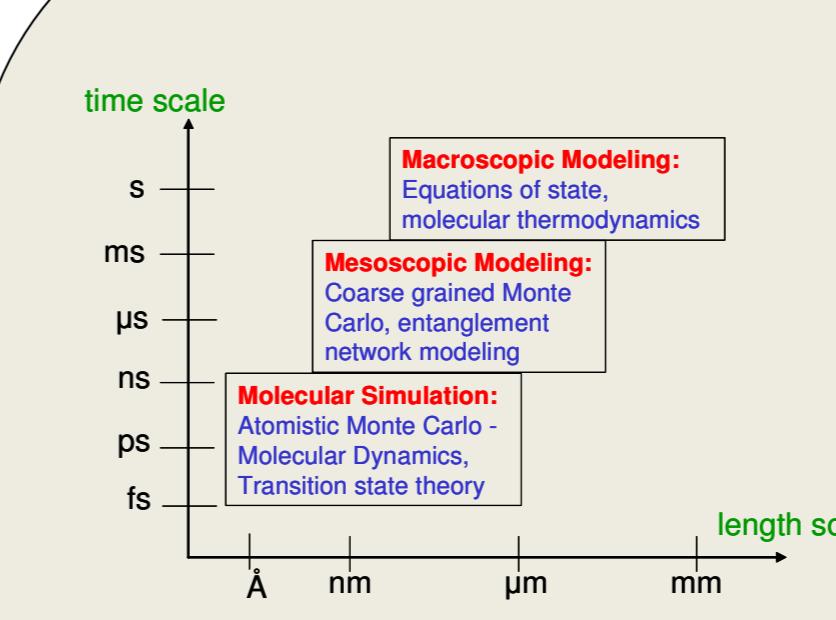
Grand Canonical Monte Carlo simulation of CO<sub>2</sub> adsorption in 9,9-carboxylic acid carbon nanotubes



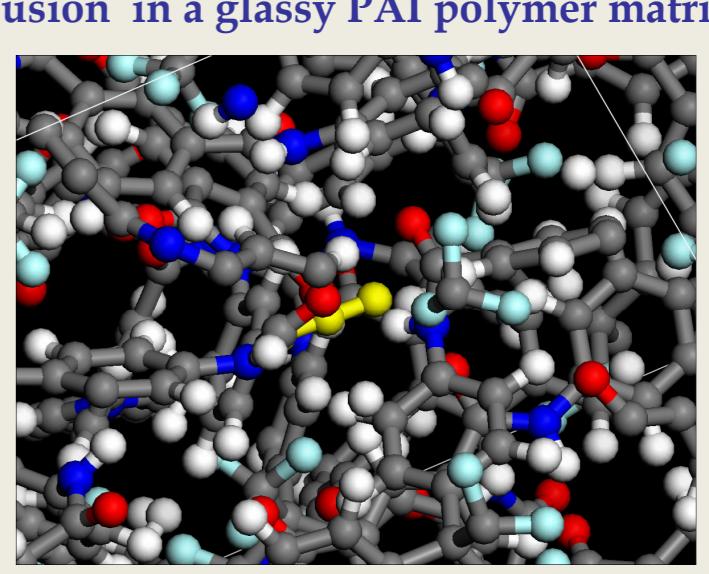
GCMC simulations of H<sub>2</sub> sorption in oxygen functionalized nanoporous carbon



MTMML-MESL



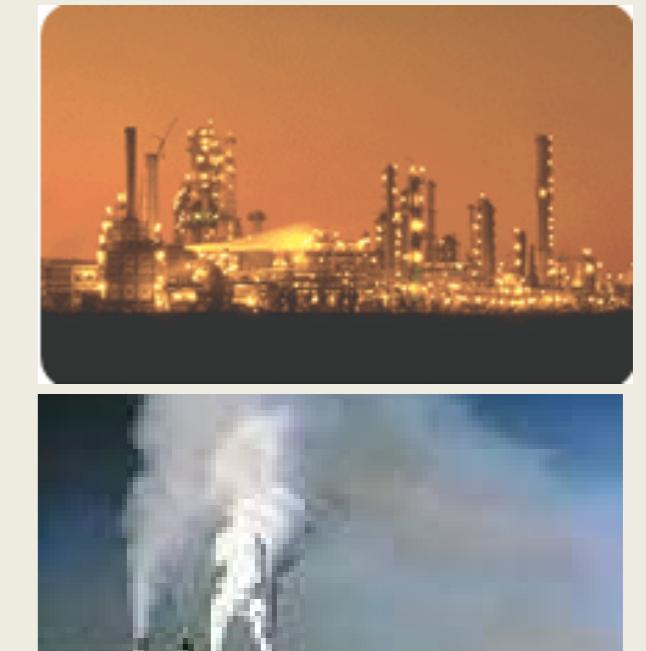
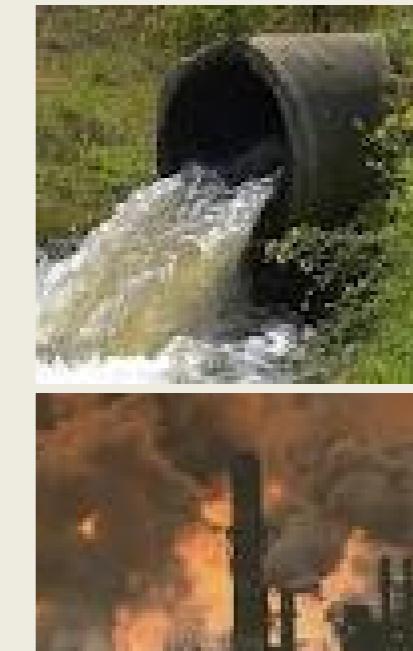
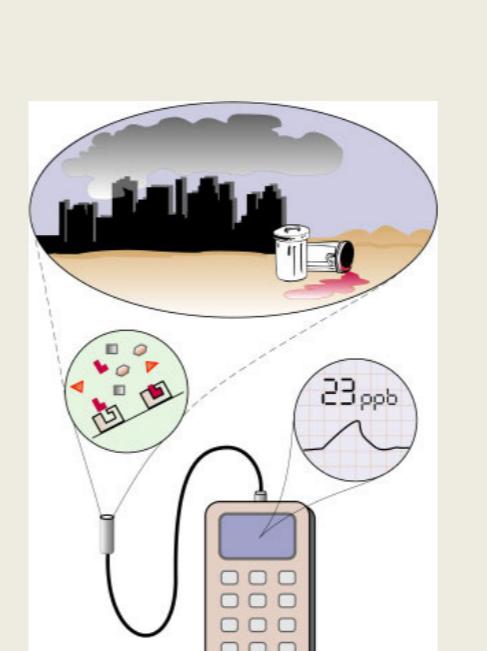
Transition State Theory Analysis of CO<sub>2</sub> diffusion in a glassy PAI polymer matrix



#### Applications (Energy-Environment-Health)

Gas & liquid Separations  
Gas storage (H<sub>2</sub>, CH<sub>4</sub>)  
CO<sub>2</sub> capture, compression, transport  
Catalysis  
Waste water treatment

Controlled release  
Chemical Sensors  
Biosensors  
Energy up-conversion  
Photonic materials



#### Research Groups

1. MESL-Materials & Membranes for Environmental Separations-Dr. Nikolaos Kanellopoulos  
Coordinator of NoE INSIDE-PORES

2. MTMML-Molecular Thermodynamics & Modelling of Materials Laboratory-Dr. Ioannis Economou

3. TMPP-Transport of matter phenomena in polymers-Dr. Merope Sanopoulos

4. ESL-Electronic Spectroscopy Laboratory: Applications to Supramolecules and Nanostructures-Dr. George Pistolis

Researchers : 9, Post Docs: 11,  
Scientific personnel: 9, PhD students: 13  
Publications 2010 : 43  
Book chapters 2010: 4