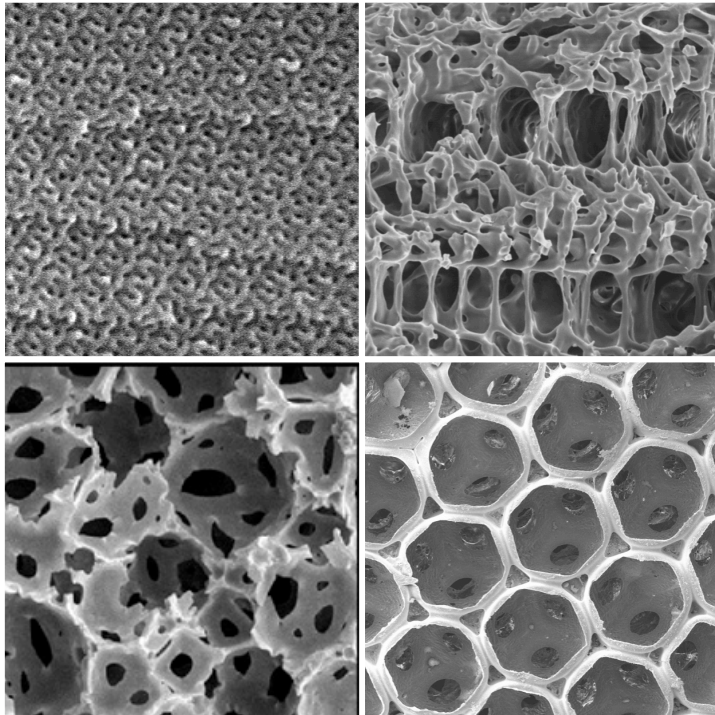


# Porous Polymers

## *Much Ado About Nothing*

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## Syllabus

1. **Introduction:** Size Scales; Motivation; Applications; Synthesis Strategies; Porous Inorganics; Comparison – State of the Art.

### *Pore Generation: Conceptual Approaches*

2. **Macromolecular Design:** Microporous Organics; Hypercrosslinking; Amorphous; Crystalline.
3. **Self-Assembly:** Amphiphiles; Block Copolymers; Surfactants; Hierarchical Systems; Porogens.
4. **Solution-Separation:** Phase Separation; Supercritical Fluids; Freeze Drying; Foaming.
5. **Solid Assembly and Templating:** Particles; Fibers; Films.
6. **Liquid Assembly and Templating:** Emulsions; Microemulsions; Breath Figures.

### *Porosity: Investigative Approaches*

7. **Intrusive:** Porosity; Adsorption Isotherms (pore volume, surface area); Porosimetry (pore size distribution).
8. **Non-Intrusive:** Ellipsometry; Scattering (x-ray, neutron, light); Spectroscopy (positron, acoustic, x-ray); Reflectivity (x-ray); Porosimetry.
9. **Imaging:** Microscopy (optical, electron, atomic force).

### *Porosity: Impact on Polymers*

10. **Mechanical Behavior:** Property Comparisons; Elastic Constants; Deformation and Failure Mechanisms; Energy Absorption.
11. **Applications:** Membranes; Reagent/Catalyst Supports; Tissue Engineering Scaffolds; Controlled Release Matrices; Lithography Masks for Microelectronics; Low-*k* Dielectrics; Hollow Capsules and Tubes; Templates for Porous Inorganics; Templates for Porous Carbons.