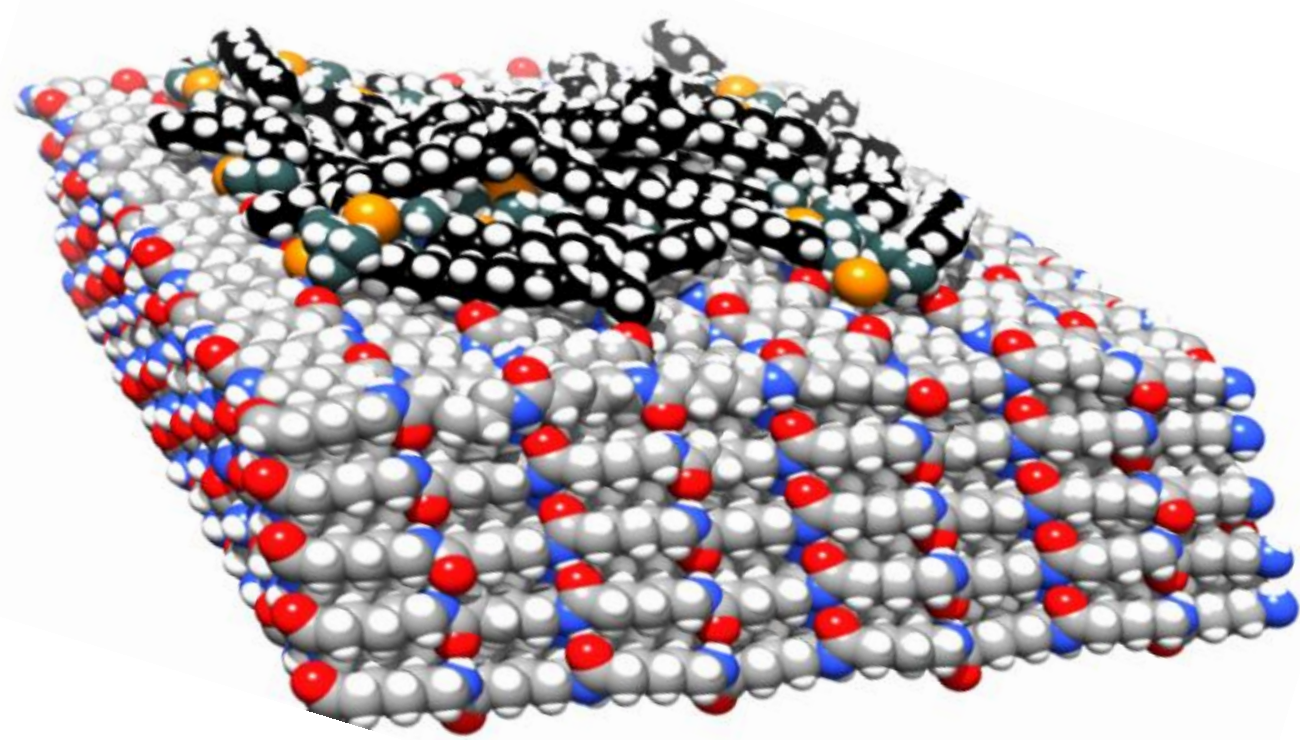
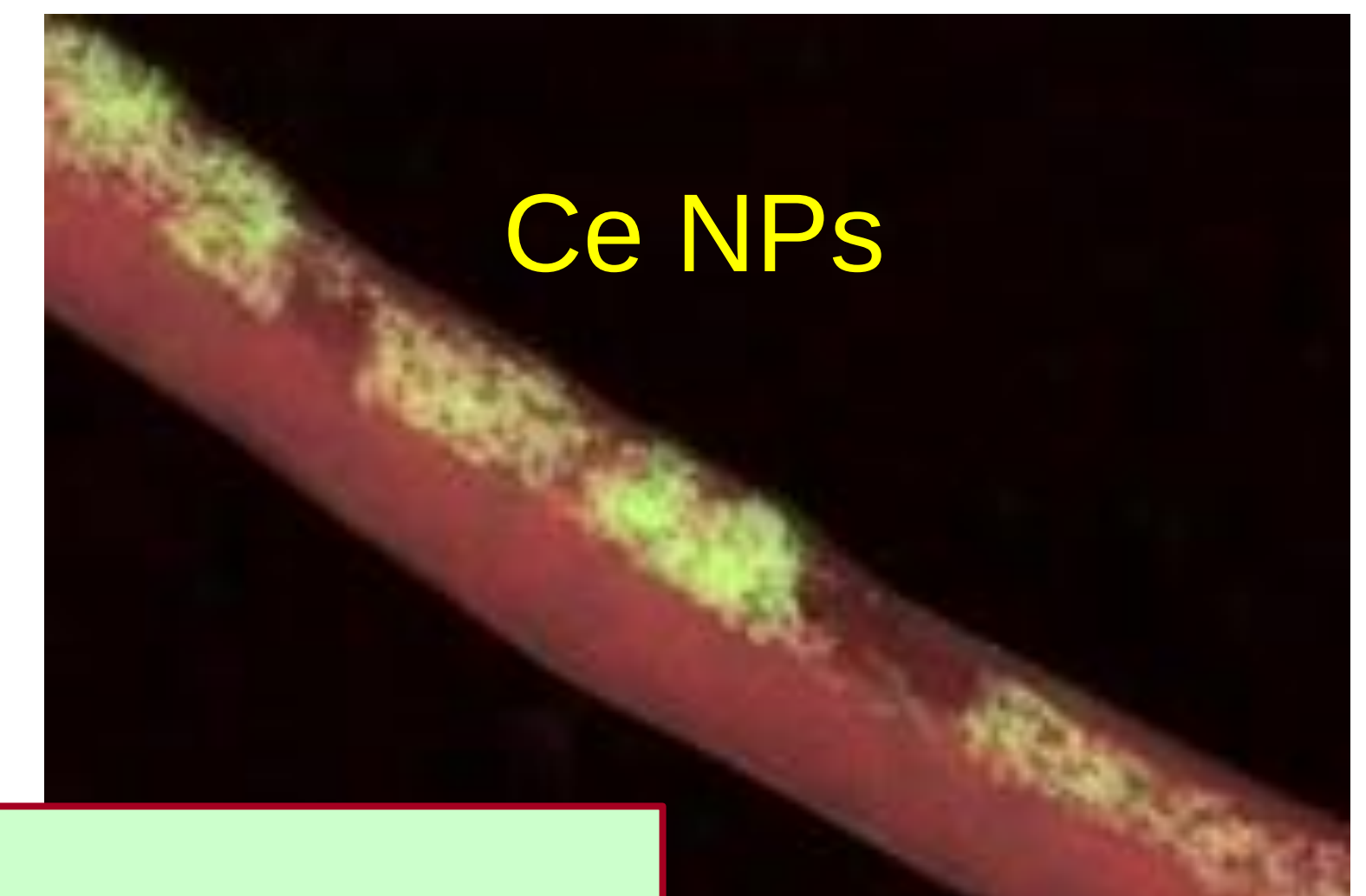
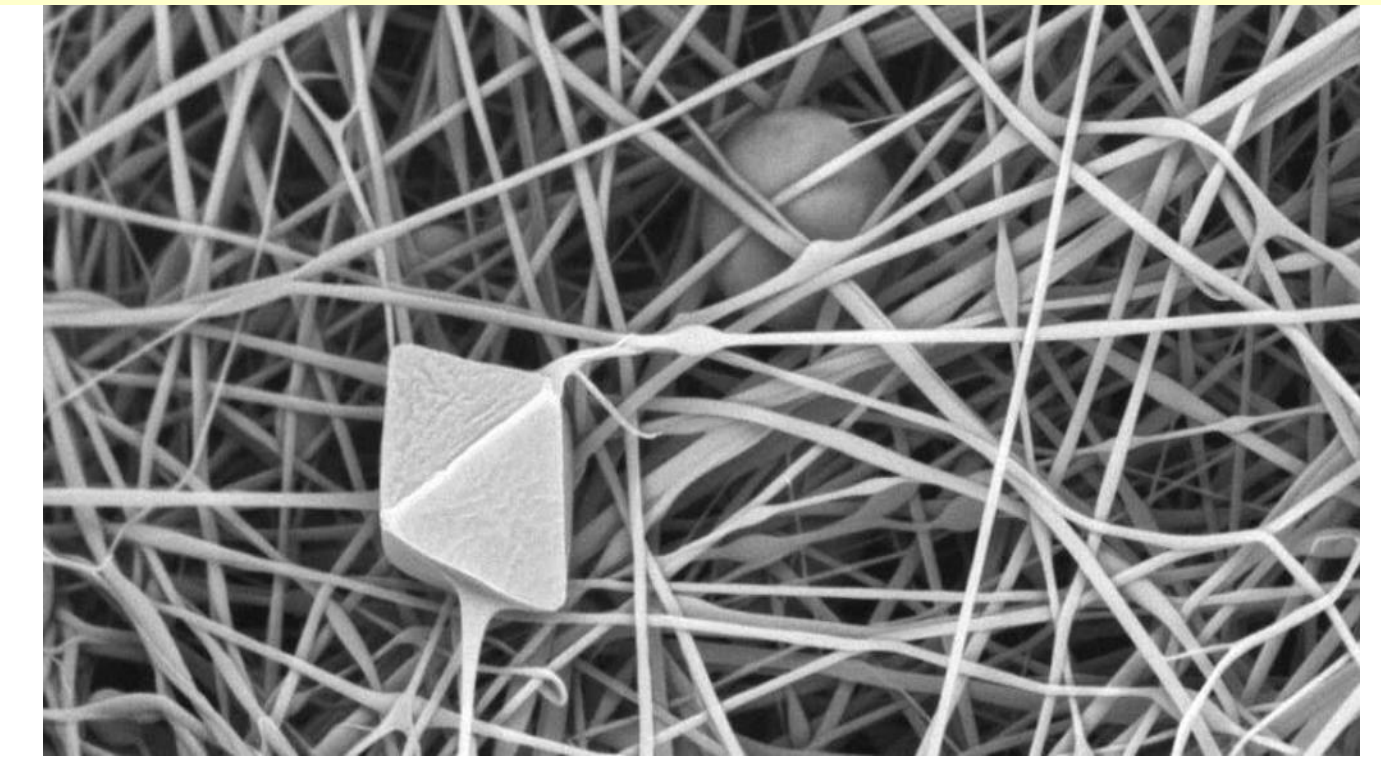




Polymer nanofibrous materials and nanocomposites based on polymer nanofibers

Polymeric nanofibrous membranes chemically modified for specific functions.

- Membranes for selective gas capture (hydrogen, CO₂)
- Photocatalytic membranes;
- Membranes for the degradation of highly toxic and difficult to degrade substances usable as face masks;
- Nanocomposite membranes as separators for Li-bateries;
- Nanocomposite membranes for biomedical applications (antimicrobial, wound dressing and tissue engineering)

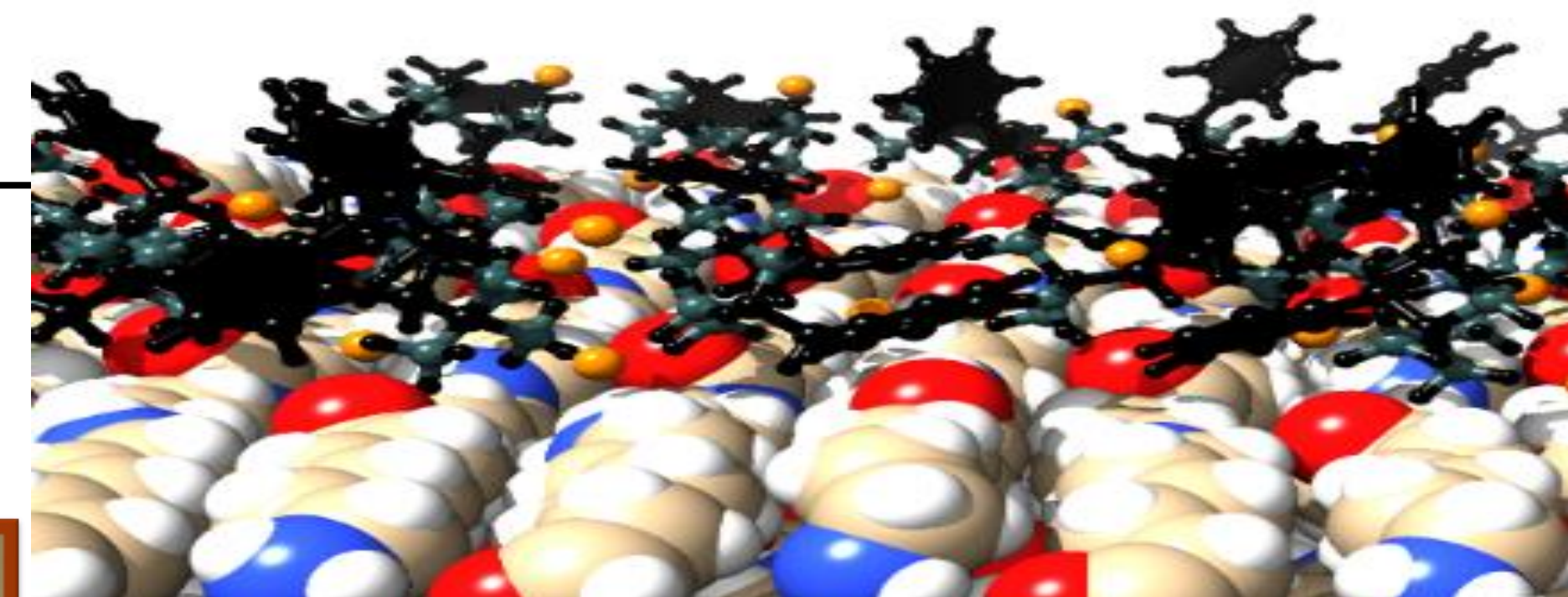


New challenges:

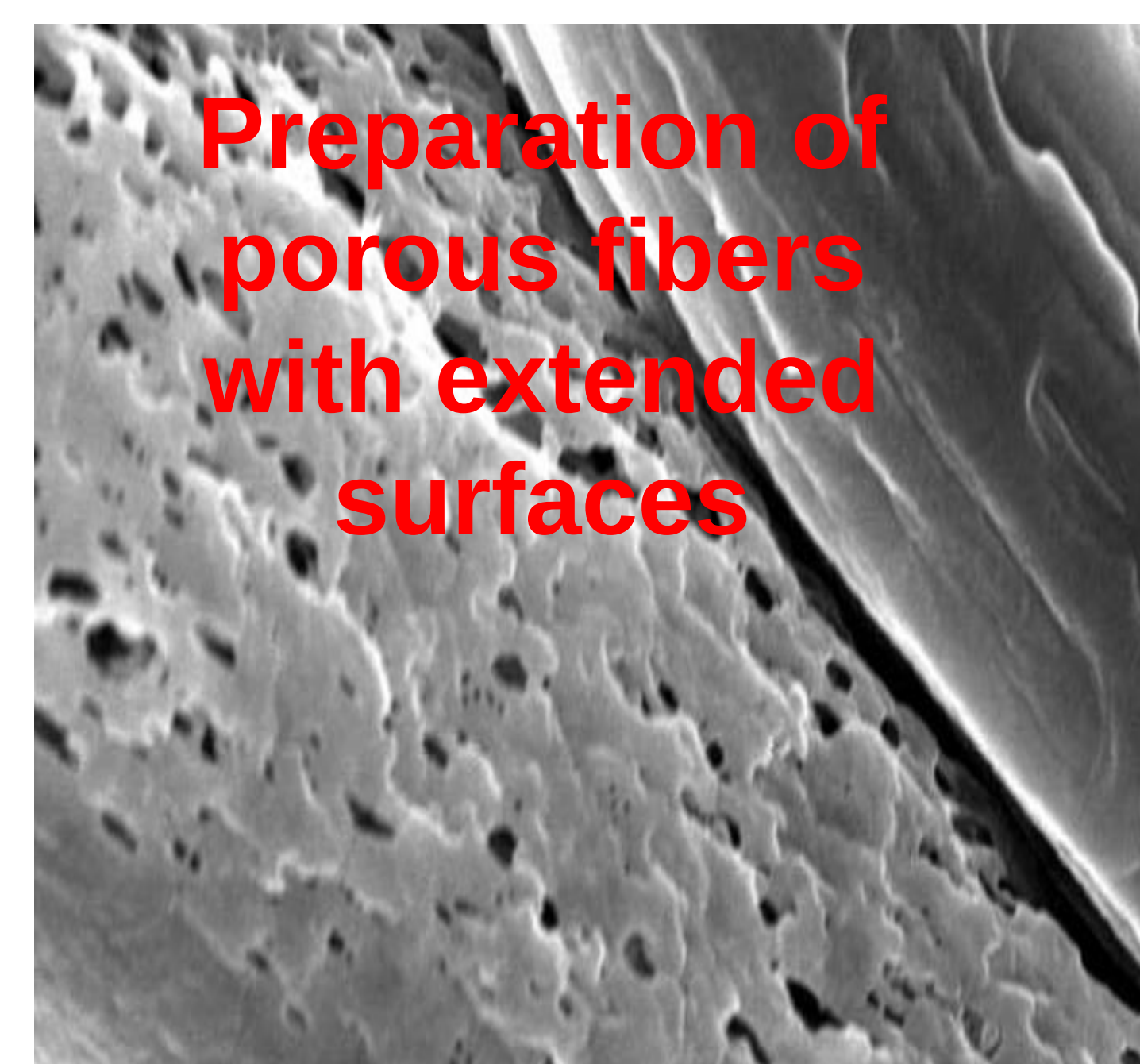
- ❑ Membranes from electroactive polymers;
- ❑ Multifunctional membranes (CO₂ capture and catalytic conversion to methane)

Approach:

- Electrospinning technology using capillary spinning and free surface spinning; electrospraying and coaxial electrospinning.
- Electrostatically **supported** centrifugal spinning (apparatus under construction)
- Chemical modification – functionalization of membranes using one step proces (modifying agent in spinning solution) and/or post spinning modification for specific functions;
- Characterization of membranes – air and liquid permeability, tensile tests;
- Membrane functionality tests: antimicrobial tests, gas capture (dynamic gas chromatography), pollutant degradation tests;
- Cooperation with team of molecular modelling.



UJEP nanofiber laboratory



Preparation of
porous fibers
with extended
surfaces



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