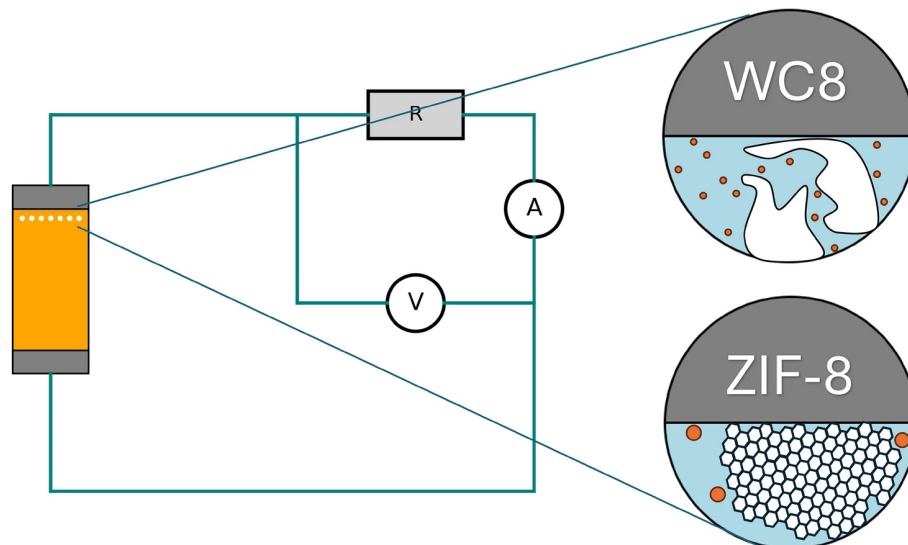


Nanoscale Solid–Liquid Contact Electrification: From Isotope Effects to Oil-Free Regenerative Shock Absorbers

Dr Yaroslav Grosu

CIC energigUNE – Interfacial Phenomena and Porous Media

This lecture will explore how solid–liquid contact electrification emerges at the nanoscale and how this phenomenon can be transformed into new concepts for energy harvesting and regenerative damping. The talk will introduce intrusion–extrusion triboelectric nanogenerators, in which liquids are forced into and out of hydrophobic nanoporous materials, creating electrical signals through the interaction between liquid and solid surfaces. It will then show how this principle can be applied to the development of regenerative shock absorbers with strongly reduced oil content and potential for oil-free operation. The lecture will also discuss how comparing ordinary water and heavy water provides a powerful isotopic methodology for probing the mechanisms of contact electrification under different wetting conditions, including immersion, droplet contact, and nanoconfined liquid intrusion. Overall, the presentation will connect fundamental interfacial phenomena with emerging technologies for sustainable energy conversion and mechanical energy recovery.



WC8 + Fullerenol

- Nanoparticles enter pores
- Electric effect enhanced
- Pressure (int) slightly reduced
 - Stable under cycling

ZIF-8 + Fullerenol

- Nanoparticles excluded from micropores
- Electric effect enhanced
- Pressure (int/ext) increased
 - ZIF-8 degrades

Giovedì 18 Giugno 2026 - ore 11:30

Aula Videoconferenze, DIMA - Via Eudossiana 18, Roma

Link Google Meet: <https://meet.google.com/khk-swwn-tsw>

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