

## Invited Lecture

**Toward the rational design of engineered zeolites for environmental remediation****Maura Mancinelli***Department of Physics and Earth Science, University of Ferrara**maura.mancinelli@unife.it*

Zeolites, as porous crystalline materials, play a crucial role in environmental remediation by effectively eliminating pollutants from air, water, and soil. Their unique structure enables selective adsorption of harmful substances, leveraging polarity, geometry channels and cavities to capture and retain ions and pollutant molecules. Zeolites demonstrate versatility in removing various pollutants, including heavy metals, pharmaceuticals, pesticides, and perfluoroalkyl compounds. Moreover, their adaptability extends to modifications for targeted pollutant adsorption and enhanced performance in diverse environmental conditions. Notably, zeolites exhibit remarkable regenerative capabilities, ensuring sustained adsorbent capacity over time. With their sustainable and efficient attributes, zeolites present a promising solution to fight environmental pollution challenges.