

# Biomaterials and their formation mechanisms

## Frontiers in Chemical Imaging Seminar Series

Presented by

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Carbonate biomaterials are among the most interesting materials on Earth. They play a major role in the CO<sub>2</sub> cycle, buffer acidifying oceans, and master templation, self-assembly, nanofabrication, phase transitions, space filling, crystal nucleation and growth mechanisms. An imaging modality, introduced in the last 6 years, enables direct observation of the orientation of carbonate crystals, at the nano- and micro-scale, and the interesting patterns they form. This is Polarization-dependent Imaging Contrast (PIC) mapping, which is based on X-ray linear dichroism, and uses PhotoElectron Emission spectroMicroscopy.

I will discuss PIC-mapping results from biomaterials, including mollusk shells, sea urchin teeth, and ascidian spicules, and show that these led to fundamental discoveries on the formation mechanisms of biomaterials.

Pupa Gilbert got her PhD in physics in 1987 at the university of Rome "La Sapienza." After being staff scientist at the Italian National Research Council (CNR) and the Swiss Institute of Technology (EPFL), she moved to the US as a full professor at the University of Wisconsin-Madison. Since 2004, her research focuses exclusively on biomaterials and their formation mechanisms, which she and her group study with multiple microscopies, synchrotron spectromicroscopies, and micro-diffraction.

**Tuesday, July 30**  
**9:00 am**

**EMSL Auditorium**

