

Biological Strategies of Materials Design
Professor Derk Joester
Northwestern University, Dept. Of Materials Science and Engineering

Abstract

Mineralized tissues, such as bones, teeth, and shells, are materials that have been optimized with respect to multiple parameters through millions of years of evolution. With a range of functions from the mechanical to light and magnetic field sensing, there is a surprising wealth of engineering solutions to biological problems based on what we call biominerals. Biominerals are essentially composites of ceramics and biomacromolecules, and through clever combination of simple building blocks at multiple levels of hierarchy, from nanometer length scales to the macroscopic, functionally complex materials with very advantageous properties result. From mother-of-pearl that is 3000 times tougher than its components, to the nano-architecture of the ultimate self-healing structural material – bone – and from the bacterial magnetite nanoparticle magnetic field sensors to the climate-influencing calcification of the scale of the Cliffs of Dover and the Great Barrier Reef, my talk will give an overview over the fascinating world of biological materials design.

Biography

Derk is originally from Munich (Bavaria, Germany) and studied Chemistry in Tübingen. He travelled to the US on a Fulbright Scholarship to study Chemistry and Biochemistry, and then went on to get his Diploma in Organic Chemistry at ETH Zurich, Switzerland in 1998. He received his Ph.D. for work carried out in organic, supra-molecular chemistry with Prof. François Diederich at ETH Zurich in 2003, and in the same year became a Postdoctoral Fellow at Weizmann Institute of Science in the lab of Prof. Lia Addadi in the Dept. Structural Biology. From 2005-2007 he continued his research at the Weizmann Institute as a Minerva Fellow. In September 2007 he accepted a position at the Materials Science & Engineering Department at Northwestern University, Evanston, Illinois. His research interests include biological processing of composite materials and the properties of the resulting hierarchical architectures.

Location:

NIU Naperville campus
1120 E. Diehl Rd.
Room: 161 B
Naperville, IL 60563
Phone: (630) 577-9101

Tentative Schedule:

4:30-5:30 pm Executive Committee Meeting
5:30-6:30 pm Hospitality Hour
6:30-7:30 pm Dinner Followed by Presentation

Directions:

From I-88, exit Naperville Road going south. Turn right onto Diehl Road. Turn left on Centre Point Circle and then left into the NIU parking lot. Parking is free; no permits are needed.

***** RSVP by Friday, Nov. 6th, 2009 *****

Pre-registration by Friday prior to meeting: \$10. Registration at door: \$15

Pre-registration for Students: Free. Registration at door for Students: \$5

To make your reservation, please go to <http://www.chicagoasm.org/>