

“Stimuli-Responsive Supramolecular Polymer Systems”

Adolphe Merkle Institute, University of Fribourg

Director and Chair of Polymer Chemistry and Materials

Host: Johan Foster



Abstract: Motivated by the persistent desire to develop new materials, which offer currently unavailable functions, research focused on the creation of polymers with tailored stimuli-responsive properties has evolved into an important field at the interface of chemistry, materials science, physics, and other disciplines. Due to their dynamic, stimuli-responsive nature, non-covalent interactions represent a versatile design element for the creation of stimuli-responsive polymers with unusual functions. This general approach is also widely used in Nature. The exploitation of specific nanostructures is another design element that has emerged in Nature to achieve specific functions. Several types of materials that rely on these general design approaches will be discussed in this presentation. Interactions that will be discussed include hydrogen-bonds, pi-pi stacking, and metal-ligand binding. Such motifs were used to assemble small molecules, supramolecular polymers, nanoparticles, and combinations of these building blocks to create mechanically adaptive and adapting, healable and other responsive polymeric materials that mimic function and/or design approaches encountered in Nature’s materials.

Bio: Christoph (Chris) Weder serves as Professor for Polymer Chemistry and Materials at the Adolphe Merkle Institute of the University of Fribourg. He is also the director of this recently established institute for fundamental and applied research on soft nano-materials and he heads the Swiss National Center of Competence in Research *Bio-Inspired Materials*.

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Bio (cont.): Chris was educated at ETH Zürich (Switzerland), was a postdoctoral fellow at MIT (Cambridge, USA), and held appointments as lecturer at ETH’s Materials Department and as a tenured and chaired Professor in the Department of Polymer Science and Engineering at Case Western Reserve University (Cleveland, USA). Chris serves the polymer community as an Associate Editor of ACS Macro Letters and as co-director of the Swiss Chemical Society’s Polymer and Colloid Division. He is a member of the Swiss Academy of Technical Sciences and a Fellow of the American Chemical Society’s Division of Polymer Chemistry. He is the recipient of the 3M Non-Tenured Faculty Award, the DuPont Young Professor Award, an NSF Special Creativity Award, and an ERC Advanced Grant.

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