



Zernike Chair 2015
Prof. Dr. Bert Meijer



Masterclass

Supramolecular Materials and Systems

August 24-28 2015 | 9.30-11.30 h

The field of supramolecular materials has become an important new area in materials science and engineering, due to the enormous progress in the understanding of molecular self-assembly and self-organization. Next to influencing the field of soft matter, these insights into supramolecular chemistry is also bridging the gap between biology and chemistry. In the master class, the main trends in both new area of science will be illustrated with examples from our research group. The following topics will be discussed in classes of 2 x 45 minutes.

Day 1: Monday August 24; 9:30-11:30 Room 5111.0080 (Nijenborgh 4)

Introduction to supramolecular chemistry and functional supramolecular materials

In a historic journey – with Nature as the source of inspiration and explaining some of the basic principles – we will address the questions: How far can we push chemical self-assembly? Is it possible to close the gap between biology, chemistry and physics?

Day 2: Tuesday August 25; 9:30-11:30 Room 5111.0080 (Nijenborgh 4)

Supramolecular (bio)materials; from scientific curiosity to technological relevance

Materials made by dynamic reversible bonds are developed and show properties that normally only reserved for covalent macromolecules. New properties related to these dynamic materials are discussed, including their use as biomaterials for tissue engineering.

Day 3: Wednesday August 26; 9:30-11:30 Room 5111.0080 (Nijenborgh 4)

Self-assembled conjugated materials and supramolecular electronics

The self-assembly of semi-conducting polymers is controlling the morphology of organic and polymer materials for electronics. The chemistry, self-assembly, morphology and properties will be discussed with a number of applications in mind. Also the scope and limitation of supramolecular electronic devices will be discussed.

Day 4: Thursday August 27; 9:30-11:30 Room 5161.0267 (Bernoulliborg)

Dendrimers and folded single-chain polymer nanoparticles; towards enzyme mimics

Nano-structures constructed from single synthetic polymers with well-defined architectures are developed. Where first dendritic structures were investigated, the field is now moving to folded macromolecules as mimics of biomacromolecules.

Day 5: Friday August 28; 9:30-11:30 Room 5161.0267 (Bernoulliborg)

Supramolecular systems; a discussion of future direction and challenges

In the last day, the challenges of future research towards responsive life-like systems will be discussed.

Which techniques are very useful to gain this information and are systems with ultra-sensitivity, feedback loops, autoregulation, buffering etc. possible to construct from scratch? Together, we will try to develop a strategy for future science

Open for TopMaster Nanoscience students, PhD students and Postdocs of the Zernike Institute and its associate members (Zernike Institute NRC)