Controlling function by using the dynamic nature of supramolecular systems

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The intriguing prospects of nanotechnology, sustainability, biomaterials, and the aim to close the gap between synthetic and biological molecular systems are important ingredients to study the cooperative action of molecules in the assembly towards functional supramolecular materials and systems. For chemists, the non-covalent synthesis of these supramolecular architectures is regarded as one of the most challenging objectives in science: How far can we push chemical assembly processes, and can we get control over the properties and functions of the responsive and adaptive architectures made? Moreover, the increasing number of different components in the assembly processes increases the complexity of the system, as many competing events occur, and pathway selection is needed to arrive at the state required for the function. Mastering this complexity with a combination of experiments and simulations is a prerequisite to achieve the challenges set in creating functional materials and systems. In the lecture we illustrate our approach using several examples out of our own laboratories. In all cases the control over the position of the molecules in time and space is needed.

[1] T. Aida, E.W. Meijer, *Supramolecular polymers - we've come full circle*, ***Israel J. of Chem***. 60, 33-47 (2020)

[2] G. Vantomme, E.W. Meijer, *The construction of supramolecular systems*, **Science** 363, 1396-1397 (2019)