

FOSTERING THE PARADIGM SHIFT IN MATERIALS RESEARCH

International Conference on Programmable Materials

27 - 29 April 2020, Berlin

Symposium

Programmable synthesis

The attempt to understand and reconstruct fundamental working principles of nature on the molecular level with synthetic materials requires polymers with specific information, function and/or complex structure formation patterns programmed into their structure. In addition, the realization of emerging applications such as sophisticated data storage approaches, compartmentalized carrier material for catalysis or synthetic analogues of biological entities such as ion channels will only be possible when having access to materials showing an enhanced level of functionality. Synthetic protocols to program desired features into polymeric materials thus become increasingly important.

While a wide variety of synthetic tools exist that allow for the integration of one or more specific functions into a common polymeric material, established synthesis protocols are limited with respect to both precision and complexity of structure on the molecular level. Precision and complexity, however, are the prerequisites for the formation of sophisticated superstructures via self-organization and/or complex adaptive behavior not only in the spatial, but also in the temporal dimension.

The symposium on "programmable synthesis" will focus on synthetic principles and protocols for strictly monodisperse polymers with defined sequences down to the monomeric unit (synthetic analogues to proteins and DNA). Analytic tools for the structural characterization of these polymers will be addressed such as nanopore sequencing and application scenarios such as sophisticated data storage will be covered.

The symposium further includes design principles and synthetic approaches towards polymers and colloidal materials that show complex but defined self-assembly patterns in spatial and/or temporal dimensions. This will include multi-step self-assembly of block copolymers and compartmentalized

colloids into respective superstructures as well as dynamic, non-equilibrium systems. Special emphasis is put on synthetic materials mimicking self-organizing and adaptive behavior found in biological environments.

The Symposium aims at bringing together people from an international research community to present and discuss the latest trends in the field of programmable synthesis including current challenges and future perspectives. It intends to provide inspiration towards so far not realized, bio-inspired applications for synthetic polymeric materials.

Lectures or posters with a half-page abstract can be submitted, which will be evaluated in a scientific selection process.

Symposium organizers

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