

# FOSTERING THE PARADIGM SHIFT IN MATERIALS RESEARCH

## International Conference on Programmable Materials

**27 - 29 April 2020, Berlin**

### *Symposium*

#### **Shape memory polymers**

The vision of programmable materials is to integrate an “on-demand” function directly into a material. This would allow programmable materials to automatically adapt to changing environmental conditions in a predetermined manner. Shape memory polymers belong to the emerging class of these programmable materials.

According to the traditional one-way programming approach, a shape memory polymer is thermomechanically treated to temporarily fix an imposed shape and allow shape recovery after the application of an external stimulus such as heat. The recent approach of programmable materials is going one step further by focusing on programming two-way effects into shape memory polymers. This allows realizing thermoreversible actuation, without the need to reprogram a material after a single switching event. These programmed shape memory polymers have a “built-in” IF/THEN switching function, i.e. only IF a specific stimulus suitable for initiating a switching process is applied, THEN a change in shape is actually performed. The advantageous material behavior can be repeatedly detected by simply changing environmental conditions such as material heating or cooling without external control. Manufacturing methods, so called 4D-printing, are being employed to produce printed polymers with shape memory effect. This has enabled significant developments to be made which can help to promote the use of these materials in new applications.

Our symposium focuses on recent progress in the synthesis, processing and additive manufacturing of shape memory polymers and the development of programming routes for one-way and in particular for two-way shape memory effects. The symposium provides an interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges and solutions adopted in the field of

shape memory polymers. Results from basic research and application-oriented development will be presented. Lectures or posters with a half-page abstract can be submitted and will be evaluated in a scientific selection process.

#### *Symposium organizers*

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