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NANOSCIENCE COLLOQUIUM

Monday
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at 14:15,
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Nucleic Acid-based Devices in Molecular Robotics and Synthetic Biology

Over the past two decades, the sequence-programmable molecular recognition properties of nucleic acid molecules have been utilized for the realization of a wide variety of artificial molecular structures and devices. In this talk, we will talk about some of our more recent efforts to integrate such devices into more complex systems. In the first half of the talk, we will discuss how DNA-based molecular structures can be utilized as components for “molecular robotic” devices, in which sensor, control and actuator functions are integrated into consistent systems. Specifically, we will describe the realization of DNA origami-based rotaxanes and molecular “robot arms”. The second part of the talk will deal with the realization of synthetic biochemical reaction circuits using functional nucleic acid structures such as riboswitches and riboregulators. We demonstrate the implementation of such circuits in the context of cell-free gene expression systems, within synthetic cell-scale compartments, and in engineered bacteria.

The speaker’s homepage: <http://www.e14.ph.tum.de/en/home/>
Friedrich Simmel is a member of NanoLunds Scientific Advisory Board from 2017.

Host: Heiner Linke (Solid State Physics)