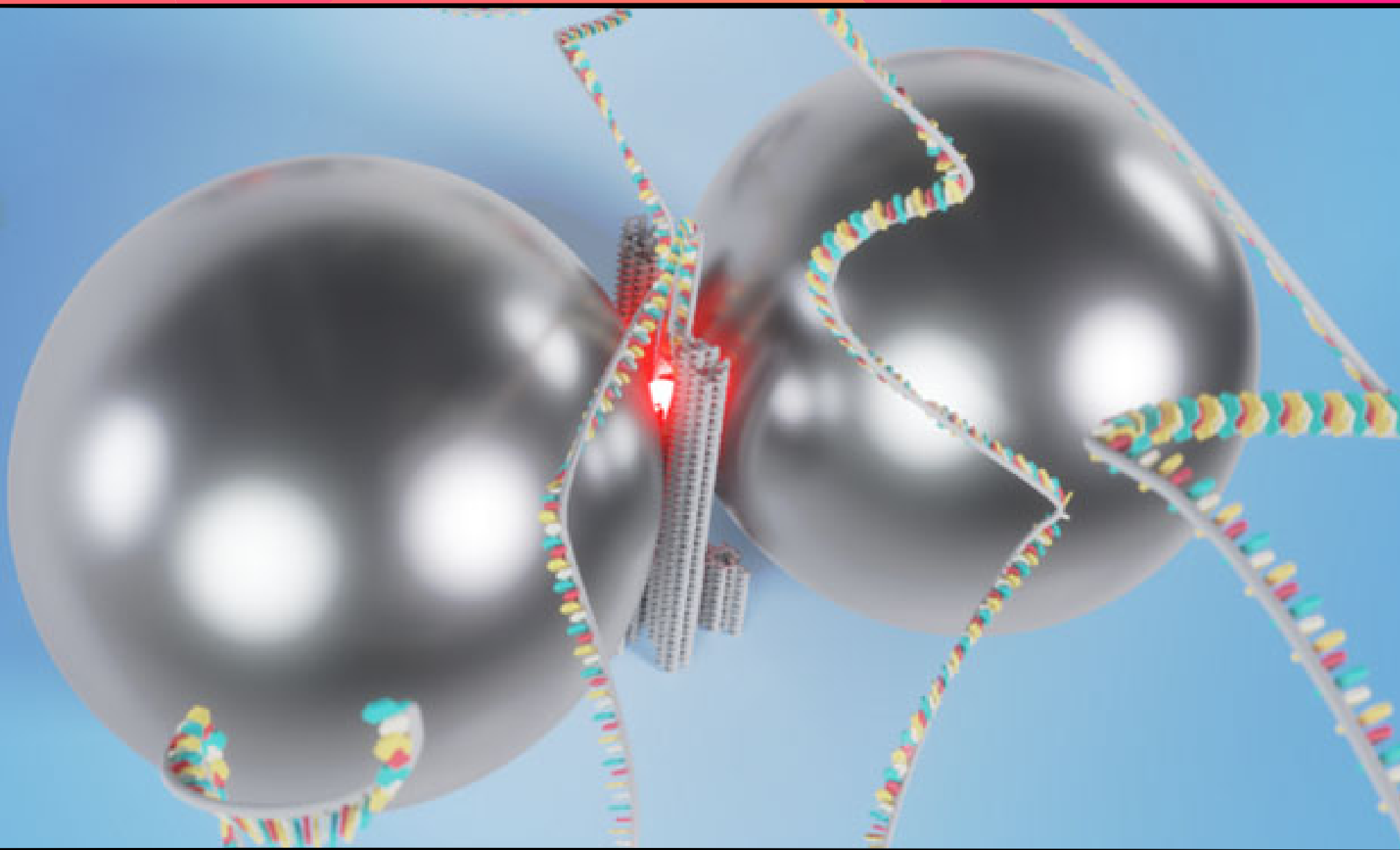


PHYSICS COLLOQUIA 2025



FEB
25

PHILIP TINNEFELD | LMU München (DEU)

Single-Molecule Detection on a Smartphone and BioSensing Enabled by DNA Nanotechnology

3:00 pm | Classroom A | Via Celoria 16 | Milan

DNA nanotechnology and especially the DNA origami technique allow the construction of complex self-assembled devices with a variety of functions that are modularly incorporated like Lego bricks.

We here present biosensing approaches enabled by DNA origami nanostructures that allow sensing of molecules such as nucleic acids, antibodies and enzymes with new transduction mechanisms and molecular logic operations.

Unique features of the sensors include fluorescence amplification by optical nanoantennas that enable attomolar nucleic acid detection by single-molecule counting on a portable microscope as well as the tuning of molecular interaction strengths and cooperativity without changing the target and bait.

The vision is the development of responsive nanorobots that sense inputs, compute and elicit a molecular response.



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