Einladung zum
ICP-Kolloquium (online)

via zoom https://zoom.us/j/98225685381?pwd=andVVW5FR0t1dkFjRjZUUnpDRWVKdz09
Meeting ID: 982 2568 5381, Passcode: 916541

Auskunft: Dr. Alexander Schlaich, Tel: 0711 685 63607

Prof. Dr. Ulrich F. Keyser
Cavendish Laboratory, University of Cambridge, UK

hält am **Donnerstag, 04. Februar 2021, 16:00 Uhr**

einen Vortrag über das Thema:

"Polymer and ion dynamics in nanopores revealed by designed DNA nanostructures"

Abstract:

DNA nanotechnology is transformative for experiments that require molecular control over the shape of nanometer-sized objects. In combination with nanopores DNA self-assembly allows for novel experiments that reveal the physics of ions, and polymers on the single molecule level [1].
Nanopore sensing, best known for DNA sequencing, translates the three-dimensional structure of molecules into ionic current signals. Designed DNA molecules enable multiplexed protein sensing with an all-electrical approach [2] and may pave the way to data storage applications [3]. Here, I will discuss our recent developments to detect and localise structures as accurately as possible along DNA molecules approaching super-resolution microscopy [3,4]. The localisation is enabled by the signal-to-noise ratio and asymmetry of our glass nanopores [5]. In the second part of the talk, I will discuss how we can study ion dynamics using DNA origami structures [6,7] including the creation of an all-optical voltage sensor based on Foerster resonant energy transfer [8]. The talk will end with our efforts to actuate DNA origami by incorporation of PNIPAM for temperature activated motion [9] and an outlook on future development and questions.

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[3] K. Chen, J. Kong, J. Zhu, N. Ermann, P. Predki, and U. F. Keyser. Digital Data Storage Using DNA Nanostructures and Solid-State Nanopores. Nano Letters, 19(2):1210-1215, 2019
[4] K. Chen, F. Gularek, B. Liu, E. Weinhold, and U. F. Keyser. Electrical DNA Sequence Mapping Using Oligodeoxynuc-leotide Labels and Nanopores. ACS nano (published online) 2021. https://dx.doi.org/10.1021/acsnano.0c07947?ref=pdf
[5] N. A. W. Bell, K. Chen, S. Ghosal, M. Ricci, and U. F. Keyser. Asymmetric dynamics of DNA entering and exiting a strongly confining nanopore. Nature Communications, 8:380, 2017.
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[7] C.-Y. Li, E. A. Hemmig, J. Kong, J. Yoo, S. Hernández-Ainsa, U. F. Keyser, and A. Aksimentiev. Ionic Conductivity, Structural Deformation and Programmable Anisotropy of DNA Origami in Electric Field. ACS nano, 9(2):1420-1433, 2015.
[8] E. A. Hemmig, C. Fitzgerald, C. Maffeo, L. Hecker, S. E. Ochmann, A. Aksimentiev, P. Tinnefeld, and U. F. Keyser. Optical voltage sensing using DNA origami. Nano Letters, 18(3):1962-1971, 2018.
[9] V. Turek, R. Chikkaraddy, S. Cormier, B. Stockham, T. Ding, U. F. Keyser, and J. J. Baumberg. Thermo-responsive Actuation of a DNA Origami Flexor. Adv. Funct. Mater., 28(25):1706410, 2018

Interessenten sind herzlich eingeladen.

Prof. Dr. C. Holm
Apl. Prof. Dr. R. Hilfer
Apl. Prof. Dr. M. Fyta