



INSTITUTE FOR
COMPUTATIONAL
PHYSICS



Universität Stuttgart

Einladung zum ICP-Kolloquium (online)

via zoom <https://zoom.us/j/99997898797?pwd=a2hSSy80QVVXWWI2UjVWUHkzQWlkQT09>
Meeting ID: 999 9789 8797, Passcode: 076002

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

Prof. Dr. Sabine Ludwigs
Institut für Polymerchemie, Universität Stuttgart

hält am

Donnerstag, 21. Januar 2021, 16:00 Uhr

einen Vortrag über das Thema:

“Bioinspired Multiresponsive Polymer Films”

Abstract:

The beauty and multifunctionality of nature has been a constant inspiration for materials scientists to mimic functionalities and hierarchical structures in man-made materials. Both, color and motion in plants are examples which can be - to some extent - replicated by stimuli-responsive polymers and materials thereof.

The field of expertise of my group are conducting polymers which are used in a number of polymer electronics devices, but also in electrochemical applications where electronic and ionic charge transport are intimately linked with each other.¹ Among various self-synthesized materials we study the commercially available blend poly(ethylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS). Apart from its use as “synthetic metal” as transparent flexible electrode, the material is a mixed conductor and also shows ionic conductivity as function of humidity as we could recently elucidate.²

The humidity dependence of the PSS polyelectrolyte phase together with the electroactive nature of the PEDOT can further be used to create multifunctional and multiresponsive materials, e.g. for humidity-triggered bilayer actuators.³ Using simple analytical models allows to predict curvatures of such “intelligent” bilayer actuators.

¹ M. Wieland, C. Malacrida, Q. Yu, C. Schlewitz, L. Scapinello, A. Penoni, S. Ludwigs, Conductance and Spectroscopic Mapping of EDOT Polymer Films upon Electrochemical Doping, in „Focus on New Materials and Applications for Organic Electrolyte Gated Transistors“, Flex. Print. Electron. 2020, 5, 014016.

² M. Wieland, C. Dingler, R. Merkle, J. Maier, S. Ludwigs, Humidity-Controlled Water Uptake and Conductivities in Ion and Electron Mixed Conducting Polythiophene Films, ACS Applied Materials & Interfaces, 2020, 12, 6742.

³ C. Dingler, H. Müller, M. Wieland, D. Fauser, H. Steeb, S. Ludwigs Understanding Mechanical Behavior to Curvature Prediction of Humidity-Triggered Bilayer Actuators; Advanced Materials 2020, accepted.

Interessenten sind herzlich eingeladen.

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