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Jena Center for Soft Matter

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Jena, 2. Mai 2019

## EINLADUNG

Am Mittwoch, **19. Juni 2019**, spricht um **15:00 Uhr**  
im Hörsaal des ZAF, Philosophenweg 7, 07743 Jena

***Herr Dr. Markus Müllner***

School of Chemistry  
The University of Sydney, Australia

zum Thema

*“Molecular polymer brushes for templating, bio applications and  
structured soft matter”*

Alle Interessenten sind herzlich eingeladen.

gez. Prof. Dr. Felix Schacher

Es handelt sich um eine Veranstaltung des SFB 1278 - POLYTARGET

## Abstract:

An application-focused design of materials is expected to overcome many limitations in current materials and biomedical sciences. The possibility to precisely engineer at the nanoscale enables the synthesis of materials with tailored chemical composition and physicochemical properties. Advances in synthetic polymer science have further nourished the fabrication of complex and functional polymer nanomaterials. Within this space, molecular polymer brushes (MPBs) form a unique class of materials that are extremely powerful in molecular templating, self-assembly, and nanomedicine. Molecular brushes, are one-dimensional nanostructures consisting of polymer chains densely tethered onto a polymer backbone. The grafting density of polymer chains eventually becomes so high that the chains become crowded and stretched, leading to their typical cylindrical shape. Due to the shape-persistent nature, the extraordinary spatial dimensions and the tuneable architecture, molecular brushes offer new opportunities in nanomaterials synthesis using bottom-up fabrication, and provide access to nanostructures that are difficult to yield from linear copolymers or otherwise. Exploiting their cylindrical shape and multiple individually separated compartments and functionalities, these materials and their analogues may be applied as self-assembly building blocks, particulate templates or nanocarriers. In this seminar, I will discuss our current research on developing MPBs as templating scaffolds for both inorganic and soft matter and touch on their use in nanomedicine and self-assembly applications.

## CV:

Markus received his Diplom in polymer and colloid chemistry at the University of Bayreuth, Germany. After research visits to the University of Lund, Sweden, and The University of Melbourne, Australia, he received his PhD in polymer chemistry under the supervision of Prof. Axel H.E. Müller in 2012. He subsequently re-joined the University of Melbourne as a postdoctoral researcher, mentored by Prof. Frank Caruso. In 2013, he was awarded a McKenzie Postdoctoral Fellowship by the University of Melbourne. Markus heads the *Polymer Nanostructures Group* (@PolymerNano on Twitter) within the Key Centre for Polymers and Colloids since joining the School of Chemistry at the University of Sydney in 2015. He is currently a Senior Lecturer, an ARC DECRA Fellow (2018-2020) and an investigator in the University of Sydney Nano Institute (Sydney Nano). He further serves as part of the Community Advisory Board for *Materials Horizons* and is the Chair of the RACI New South Wales Polymer group.