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**Pattern formation and control in polymeric systems: From Minkowski measures to in situ AFM imaging**

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Thin liquid polymer films are not only of great technical importance, they also exhibit a variety of dynamical instabilities [1]. Some of them may be desired, some rather not. To analyze and finally control pattern formation, modern thin film theories are as vital as techniques to characterize the morphologies and structures in and on the films. Examples for the latter are atomic force microscopy (AFM) as well as scattering techniques [2]. The talk will introduce into the practical applications of Minkowski measures to characterize patterns and explain what thin film properties (e.g. capillary number, solid/liquid boundary condition, glass transition temperature, chain mobility) can further be extracted including new technical possibilities by AFM and scattering techniques [3].

[1] O. Bäumchen, L. Marquant, R. Blossey, A. Münch, B. Wagner and K. Jacobs, “Influence of slip on the Rayleigh-Plateau rim instability in dewetting viscous films,” (submitted).

[2] P. Gutfreund, O. Bäumchen, R. Fetzer, D. van der Grinten, M. Maccarini, K. Jacobs, H. Zabel and M. Wolff, “Solid surface structure affects liquid order at the polystyrene–self-assembled-monolayer interface,” *Phys. Rev. E* **87** (2013) 012306.

[3] O. Bäumchen, R. Fetzer, M. Klos, M. Lessel, L. Marquant, H. Hähl, K. Jacobs, “Slippage and nanorheology of thin liquid polymer films,” *J. Phys.:Condens. Matter* **24** (2012) 325102.