

PROBING SOFT MATTER BY DIRECT FORCE MEASUREMENTS

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Atomic force microscopy (AFM) allows not only to image the surface properties of samples but also to determine interaction forces with high force resolution and in a laterally resolved manner. For many soft matter systems an important advantage of force measurements by AFM lies in the opportunity to replace the standard tip by other objects, ranging in dimension from colloidal particles down to grafted polymer chains. Therefore, this technique allows probing relevant interactions in a large variety of soft matter systems. Examples in this talk will include the properties of hydrogels and polymer brushes, the interaction forces between polymer-coated colloidal particles, and the desorption of single polymer segments or peptides from solid substrates. Furthermore, it will be demonstrated how mechanical and force measurements in soft matter systems can benefit from combining AFM with other techniques, such as optical microscopy, electrophoretic mobility, or electrochemistry.

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