

Postdoctoral Positions for Immediate Availability in Soft Matter and Complex Fluids at Carnegie Mellon University

Two postdoctoral research positions are available immediately at Carnegie Mellon University in the context of a new soft materials research initiative, funded jointly between the colleges of science and engineering. The project, directed by Markus Deserno (Physics) and Robert Tilton (Chemical Engineering and Biomedical Engineering), includes Krzysztof Matyjaszewski (Chemistry), Shelley Anna (Chemical Engineering and Mechanical Engineering), Lynn Walker (Chemical Engineering) and Mathias Lösche (Physics). The goal is to develop soft actuator systems based on colloids and complex fluids through a hierarchical design in which external stimuli (e.g. light, magnetic fields, or temperature pulses) trigger local conformational changes that feed through a controlled hierarchy of scales (e.g. from polymers to colloids to fibers to the overall material) and result in macroscopic actuation. The project will be organized as a tight cross-disciplinary collaborative team effort, bridging components from computational and experimental soft matter physics, synthetic chemistry, complex fluids and interface science. The projects of the two postdoctoral researchers will be interlinked with each other and to a synthetic polymer chemist in the Matyjaszewski group. The two new postdoctoral positions emphasize the following:

(a) Computational soft matter physics: the candidate will conduct atomistic and coarse-grained simulations to explore how nanoscopically structured materials respond anisotropically to external isotropic triggers. This work will assist complementary experimental characterization, but also propose novel design concepts, specifically the possibilities of realizing artificial thermal ratchets. Candidates are expected to have excellent hands-on experience in computational soft matter science, especially coarse-graining and multiscale modeling. Additionally, a strong background in soft matter theory and nonequilibrium statistical physics will be advantageous. A Ph.D. in Physics, Chemical Engineering, Physical Chemistry or related discipline is required. **Interested candidates should send a curriculum vitae and contact information for three professional references to deserno@andrew.cmu.edu.**

(b) Experimental colloid and soft matter science: the candidate will design assemblies of polymer-functionalized colloids that produce an anisotropic response to external stimuli under confinement, develop actuating systems based on their coupling, and investigate the mechanics and dynamics of designed systems and components in order to optimize actuator performance. Attributes of the ideal candidate include experimental experience in colloidal and polymer solution physics with a strong background in colloidal forces, directed colloidal assembly and soft matter mechanics. A Ph.D. in Physics, Chemical Engineering, Physical Chemistry or related discipline is required. **Interested candidates should send a curriculum vitae and contact information for three professional references to tilton@cmu.edu.**

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