



Magnetics and Microhydrodynamics, from guided transport to delivery

ESR 4 Imaging locally driven flows

Research project	<p>Flexible magnetic filaments self-propel under the action of AC magnetic fields. They have many possible applications in microfluidics¹, for example, as mixers. Efficiency of their action is determined by the flow of the surrounding fluid. Our goal is to measure flow fields around magnetic filaments driven by different magnetic-field configurations using a micro Particle Image Velocimetry system that is available in our lab. Our previous experience is connected with the registration of the micro-flows around fingers initiated by magnetic micro-convection². These measurements will be linked to corresponding numerical simulations of the flow fields around magnetic swimmers and will help to formulate the requirements for efficient self-propulsion of magnetic filaments and mixing, and build the knowledge base for developing applications based on controlled micro-object motility or induced flows in microfluidic conditions.</p> <p>¹ A. Cebers and K. Erglis, <i>Adv. Funct. Mater.</i>, 26 (2016), 3783–95. ² K. Erglis et al., <i>J. Fluid Mech.</i>, 714 (2013), 612–33.</p>
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Host Institution	University of Latvia  LATVIJAS UNIVERSITĀTE ANNO 1919 UNIVERSITY OF LATVIA  Magnētisku Mīkstu Materiālu Laboratorija LAB OF MAGNETIC SOFT MATERIALS MMML lab (Lab of Magnetic Soft Materials) Department of Physics Zellu street 25-059, Riga, LV-1002, Latvia http://mmml.lu.lv/
Required profile	The candidate should hold a Master degree in Physics or similar disciplines. Background in soft matter and microfluidics will be considered an advantage. Interest for interdisciplinary research is important. Research stays are planned at the Max Planck Institute for Dynamics and Self-Organization (Germany) and Trinity College Dublin (Ireland). The candidate should not have stayed in Latvia in the past 12 months.