

Explorations beyond light driven microswimmers (Modulantrag)

Initiative: Freigeist-Fellowships

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Laufzeit: 2 Jahre 4 Monate

In the first subproject, the use of microfluidics will help to address further ongoing research questions (variation of young's modulus in microswimmers). One important aspect of microswimmers, influencing most of their behaviors are surfaces. This includes not only the surfaces of the microswimmers themselves, but also the surfaces of all objects and planes in the surrounding of the swimmers. One crucial aspect of both, swimming and interactions are the flows created in the vicinity of the particles. Here, the second subproject is located. There are different methods to identify flows, mostly difficult to translate to the microscale. To modify the surface of microswimmers, in the third subproject a reactive molecule are developed and analyzed, which changes state upon light irradiation. Then the influence on the swimming are tested, as well as the interactions with the surroundings. This methodology is rather versatile and can be applied not only to microswimmers. While the main Freigeist project treats mainly the material chemical aspects of creating new oxide based colloids, composites and new shapes to enhance photocatalytic performance and evaluate how these affect the active motion, this project extends this aspect to more organic materials in the last subproject. Focusing on Phtalocyanides, which are synthetically produced cousins of the porphyrines, used by plants and microorganism to capture sunlight, the material spectrum is broadened towards more naturally inspired components. Other materials like Perovskites will be added and used to make more versatile combinations.

Projektbeteiligte

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