CENTER FOR RESEARCH IN SOFT MATTER & POLYMERS

CRiSP SEMINAR

FRIDAY, MAY 7, 2021

10 A.M. - 11 A.M.

ZOOM WEBINAR

"Strategies for Dynamical Self-Assembly of Active Matter"

Living organisms—capable of remarkable large-scale organization and coordination the kind of which is seen in fish schools, vegetation patterns, or microbial mats—are hypothesized to coordinate their self assembly by using a mix of shorter-distance and longer-distance interactions, including physical contact and chemical communication. By now we have a good grasp on how to engineer coordination in large collections of relatively simple communication-sensing-actuation platforms at the macro scale, there are many open questions about how similar behaviors can be achieved at the micro scale (<100 μm). We currently lack the understanding on how to trigger and steer different local microscale behaviors within the same collective for many soft matter systems like active particles.

Here, I will describe work exploring the directed self assembly of micron scale active particles. We aim to exploit the particle composition, chemical identity and surface chemistry to control the motion with response to control signals such as magnetic field, light or chemical gradients. Our goal is to design strategies for controlling active matter self assembly realized by swarms of micromotors.

CLICK HERE for Das' faculty profile.

DR. SAMBEETA DAS

Assistant Professor

Mechanical Engineering

UNIVERSITY OF DELAWARE

Dr. Sambeeta 'Sam' Das is an assistant professor at the University of Delaware in the Mechanical Engineering Department. Before joining the University of Delaware, Dr. Das was a postdoctoral researcher for three years at the University of Pennsylvania. She was part of the GRASP Lab where she worked on microrobotic control and application of microrobots in biological systems. She earned her Ph.D. at the Pennsylvania State University in 2016 and her doctoral research was on directing micro and nanomotors and their applications in lab-on-a chip devices. Prior to her doctoral studies, she earned her Masters with distinction from the University of London and her Bachelors in Physics from Presidency College, India. She is the recipient of multiple awards including a graduate fellowship from the Pennsylvania State University, the overseas research award fellowship from the government of the United Kingdom, and the Science and Engineering Excellence Fellowship from the University of London. Dr. Das's research is very interdisciplinary spanning multiple fields like robotics, autonomous systems, physics, organic chemistry, materials engineering, soft matter, and biomedical engineering. The goal of her lab is to seamlessly combine these disparate disciplines to address challenges in micro-bio-robots. Her research activities focus on developing microrobots capable of a variety of biomedical applications; such as tissue engineering, personalized therapeutics, drug delivery, and high throughput biotechnology research.

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