

## University of Miami, Physics Department Colloquium

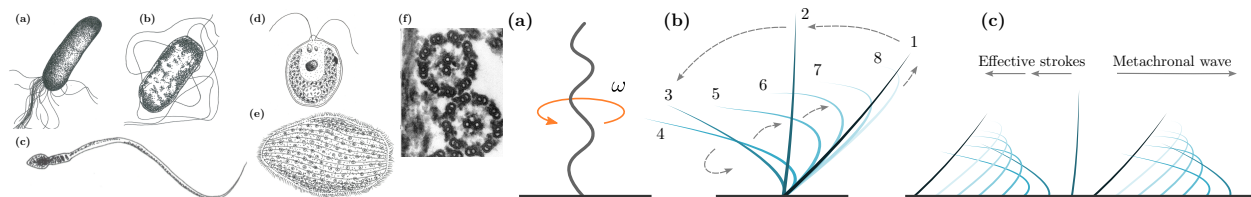
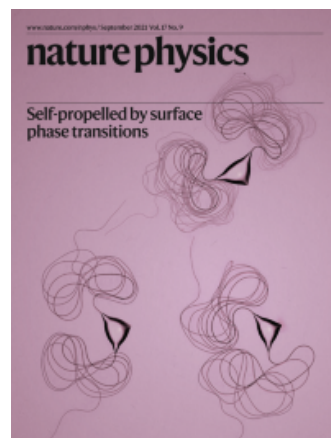
**Date:** Wednesday, August 28<sup>th</sup>, 2024  
**Time:** 4:00 pm – 5:00 pm  
**Location:** Wilder Auditorium – Room 112, Knight Physics Building

### Tales of tails: Elastohydrodynamics of microscale locomotion

**Dr. Maciej Lisicki**  
 University of Warsaw

#### Abstract

A look into the microworld reveals plethora of swimming microorganisms, which display a rich variety of shapes and swimming gaits. Despite this diversity, the physics of microscale imposes universal limitations on their propulsion strategies. In my talk, I will review the basic properties of Stokes flows and their consequences on swimming. Next, I will show an artificial system of microscale oil droplets that have the ability to swim due to a surface phase transition driven by environmental temperature fluctuations. I will demonstrate how a coarse-grained elastohydrodynamic model can be successfully employed to quantitatively describe the motion of droplets. I will also show a couple of other examples where a simplified elastohydrodynamic model proves useful for the prediction of diffusive properties.



**Biography:** Dr. Maciej Lisicki is a professor at the Faculty of Physics, University of Warsaw, currently on sabbatical as Fulbright Scholar at the University of Pennsylvania. He works in the field of soft matter physics and biological fluid dynamics. He is also interested in the physics of everything that flows around us. After his PhD in colloidal science at the University of Warsaw, Maciej spent 3.5 years as a postdoctoral fellow at the University of Cambridge, researching how bacteria swim and induce microscale flows in their surroundings. Their propulsion mechanisms inspire artificial designs and foster the development of the field of active matter systems.

As a side activity, he recently co-authored a review paper on kitchen flows and leads a team researching the physics of brewing an ideal espresso. Maciej is also keen on sharing his experience with the public through various outreach activities. Apart from science, Maciej greatly enjoys the outdoors, hiking, skiing, cycling, and chasing life's little pleasures.