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Ricardo Cortez* (rcortez@tulane.edu). *Mathematical and Computational Modeling of Microorganism Swimming.*

Microscopic swimmers like bacteria and spermatozoa live in highly viscous environments. Their locomotion and the fluid flows they generate around them have been actively investigated for the last 60 years motivated by questions about effective locomotion strategies, the organism's interaction with the surrounding environment, patterns of collective motion, propulsion, and more. These issues are typically addressed through a combination of theory, experiments, mathematical modeling and simulation. I will describe the method of regularized Stokeslets, a computational technique based on fundamental solutions of PDEs designed for simulating these viscous flows, and will present recent collaborative mathematical work, some of it done with undergraduate students, that sheds light on these biological systems and challenges ahead. (Received August 18, 2016)