School of Molecular Sciences
Arizona State University

SMS Fall 2023 Seminar Series

Friday Sept 15 | 3pm | Biodesign Auditorium

Bio-inspired systems for sustainability and clean energy

Significant effort has been devoted to developing technologies to effectively mimic biological processes, but these methods often fail to replicate the efficiency and selectivity of native systems. We have found that by combining chemistry with the inherent activity of biomolecules and microbes, we can improve upon conventional technologies for clean energy and sustainability. Specifically, by combining biomolecular assembly with conventional electrocatalysis, we have improved the specificity and efficiency of electrocatalytic CO_2 reduction. Additionally, we have engineered bio-derived microbial coatings to enable their delivery to depleted soil. Finally, by combining electroactive microbes with engineered enzymes, we have developed a platform to degrade and electrochemically detect harmful pesticides. Through these technologies, we have consistently found that the combination of chemistry and biomolecular engineering affords advantages beyond the capabilities of either technology alone.

Ariel L. Furst

Assistant Professor, Massachusetts Institute of Technology

Ariel L. Furst is the Paul M. Cook Career Development Professor of Chemical Engineering at MIT. Her lab combines biological, chemical, and materials engineering to solve challenges in human health and environmental sustainability. The Furst Lab develops technologies for implementation in low-resource settings to ensure equitable access to resources. By engineering microbes as catalysts and sensors, her group can degrade harmful environmental contaminants, monitor water and soil quality, and treat disease. She is a CIFAR Azrieli Global Scholar, a 2023 Marion Milligan Mason Awardee, and a 2022 Army Research Office Early Career Awardee. She is also the recipient of the 2022 MIT Undergraduate Mentoring award and has mentored over 30 undergraduates at MIT so far. She passionate about STEM outreach and increasing participation of underrepresented groups in engineering.

**ZOOM option available: https://asu.zoom.us/j/81517529537*