



UNIVERSITY OF GUAM  
COLLEGE OF NATURAL  
& APPLIED SCIENCES

# Hydrodynamics: The Flow Tale Series

PHYSICS AND CHEMISTRY LECTURE

## Light-Switchable Propulsion of Active Particles with Reversible Interactions

4 p.m. | Thursday, Aug. 22  
Science Bldg. Room 101, University of Guam



FEATURING VISITING  
FULBRIGHT SCHOLAR  
**DR. MACIEJ LISICKI**

Active systems such as microorganisms and self-propelled particles show a plethora of collective phenomena, including swarming, clustering, and phase separation. Control over the propulsion direction and switchability of the interactions between the individual self-propelled units may open new avenues in designing of materials from within. Dr. Lisicki presents a self-propelled particle system, consisting of half-gold-coated titania ( $\text{TiO}_2$ ) particles, in which we can quickly, and on-demand, reverse the propulsion direction by exploiting the different photocatalytic activities on both sides. He demonstrates that the reversal in propulsion direction changes the nature of the hydrodynamic interaction from attractive to repulsive and can drive the particle assemblies to undergo both fusion and fission transitions. Moreover, he shows these active colloids can act as nucleation sites.