

**Speaker: Itamar Kolvin**

**Time: 11:00am-12:00pm**

**Location: Whitaker Biomedical Engineering 1103**

**Title: Dynamics of active interfaces**

**Abstract:** Biological interfaces are continuously perturbed by energy-consuming molecules. Active stresses at interfaces make cells crawl, change shape, and reorganize their content. How should we understand the dynamics of active interfaces? I will present experiments that couple active stresses to soft interfaces. Active liquid-liquid interfaces are formed by merging molecular motors and their associated biofilaments with water-soluble phase-separating polymers. Consequently, interfaces support wave propagation without inertia, droplets undergo spontaneous fission, and fluids climb vertical walls. I will also show how active stresses mold crosslinked actin filament bundles into dynamic solid membranes. Giant bending fluctuations endow membranes with soft stretching degrees of freedom. For membranes that are a few millimeters in width, system-size periodic oscillations appear that are coupled to unidirectional flow waves. Active stress is thus an emerging paradigm for the assembly and dynamics of matter.

**Bio:** I am an experimental physicist interested in the multi-scale dynamics of matter. I obtained my Ph.D. in Physics from the Hebrew University of Jerusalem for studying dynamic fracture in brittle hydrogels. In 2017, I became a Human Frontier Science Program fellow at UC Santa Barbara. I assemble materials from biological components with unique functionalities to ask how active matter moves and how fibrous gels deform.