



Ben-Gurion University of the Negev
Blaustein Institutes for Desert Research
The Swiss Institute for Dryland Environmental and Energy Research
Alexandre Yersin Department of Solar Energy and Environmental Physics

Spontaneous buckling of contractile poroelastic actomyosin sheets

Anne Bernheim
Dept. of Chemical Engineering
Ben-Gurion University

Abstract

Planar actively contractile materials can self-organize into various patterns. While the in-plane dynamics due to active stresses was extensively studied, the role of such contractility in producing out-of-plane deformations has not been explored. Here, we show that the contraction dynamics of myosin motors leads to buckling of initially homogenous, thin, poroelastic actin sheets. Motor-induced contraction depends on system size due to the long-range nature of elastic forces. Contraction starts at the system boundaries, proceeds into the bulk, eventually leading to spontaneous buckling of the entire sheet. This instability is intimately linked to the spontaneous emergence of gradients in the gel density during contraction. Our system offers a well-controlled way to study mechanically induced, spontaneous shape transitions in active matter.

Date & Location:

Tuesday, June 12, 2018, 11:00

Lecture room, Physics Building (ground floor)

YDSEEP WEEKLY SEMINAR

