

# FASSBERG

## SEMINAR SERIES



**Kinneret Keren**  
**Technion, Haifa, Israel**

special  
date & time

### **Centering and symmetry breaking in contracting actomyosin networks**

Contracting actin networks have an essential role in many cellular processes including cell division, intracellular transport and cell motility. While the molecular components involved are largely known, we still do not understand what controls the contractile behavior of these networks. To study contracting actin networks we have developed an *in vitro* experimental system based on cytoplasmic *Xenopus* egg extracts encapsulated into cell-sized water-in-oil droplets. Importantly, the presence of rapid turnover in our system allows the system to attain a dynamic steady state characterized by contractile actin flows which persist for hours. We find that under a broad range of conditions, the network undergoes homogenous contraction despite large spatial variations in network density. We observe either a symmetric state in which the network contracts towards the center of the droplets and exhibits a spherically symmetric density and flow pattern, or a polar state in which the contraction center is localized near the droplet's boundary. In the symmetric state, the contraction center is actively maintained near the middle of the droplet, reminiscent of actin-based centering mechanisms found in living cells. During symmetry breaking, the system transitions from this symmetric state to a polar state, mimicking cellular symmetry breaking as seen for example during motility initiation or spindle migration in mammalian oocytes.

**Host: Melina Schuh**



**Monday / 23.09.2019 / 13:00**  
Max Planck Institute for Biophysical Chemistry  
Large Seminar Room / Administration Building

