



Der Vorsitzende des Promotionsausschusses

EINLADUNG

Hiermit lade ich ein zum öffentlichen Promotionskolloquium von

Frau M.Sc. Shima Asfia
Experimentalphysik
(Prof. Dr. Ralf Seemann)

am

Freitag, 6. Februar 2026, 16:00 Uhr s.t.

per Videokonferenz: Link für MS Teams: <https://t1p.de/af2qy>

Raum für die Prüfung: Seminarraum 0.07, Gebäude E2.9

Thema der Dissertation:

Microfluidic Platform to Study the Model Cell Membranes: Biophysical Properties and Organelle Interactions of Lipid Droplets

This thesis presents an in vitro study of model cell membranes, focusing on the biophysical properties of lipid droplets (LDs) and their protein-mediated interactions using microfluidic platforms. Fluorescence-based optical methods and interfacial tension measurements reveal how lipid composition controls LD surface behavior, diffusion, and membrane tension. PLIN2-decorated LDs embedded in free-standing bilayers adopt a flattened shape and enable lipid exchange across interfaces. Additionally, PLIN5 promotes stable tethering between LDs and model organelles while reducing lipid exchange. Overall, this work demonstrates how microfluidic systems enable controlled studies of LD structure, function, and organelle communication.

Saarbrücken, 23. Januar 2026



Prof. Dr.-Ing. Georg Frey