

EML WEBINAR

ZOOM: [HTTPS://EMLWEBINARS](https://EMLWEBINARS)

MONDAY, 19 OCTOBER 2026

10 AM BOSTON, 10 PM BEIJING

4 PM PARIS, 3 PM LONDON



ANTON SOUSLOV

UNIVERSITY OF CAMBRIDGE

NON RECIPROCITY IN MATERIALS

The properties of soft and nanoscale materials emerge from the interplay between mechanical forces and thermal fluctuations. Non-reciprocal interactions drive these systems out of equilibrium. I will discuss two recent works in which the combination of thermal fluctuations and transverse (odd) forces leads to surprising phenomenology. In self-assembly [1], odd interactions preserve the Boltzmann distribution but nevertheless induce non-equilibrium probability currents that accelerate barrier crossing. We consider the interplay between power dissipation and speed-up in systems with small numbers of particles where analytical results are possible. In two-dimensional odd crystals [2], active forces can alter the character of the melting transition away from the usual KTHNY picture. Instead, dislocations proliferate even at zero temperature, driving what we dub a topological instability. Surprisingly, even stronger activity brings reentrant crystallization.

[1] D. Dopierala, L. Cocconi, R. L. Jack, and A. Souslov, Odd pathways speed up self-assembly, arXiv:2604.22408 (2026).

[2] Z. Davoyan, A. Jha, and A. Souslov, Topological instability and reentrant crystallization in active solids, arXiv:2609.09500 (2026).

Anton Souslov is an Associate Professor in the Cavendish Laboratory, Department of Physics at the University of Cambridge, working on the theory of topological states, mechanical metamaterials, and active matter. He was an academic at the University of Bath from 2018 to 2023. Previously, he worked in the James Franck Institute at the University of Chicago, the Lorentz Institute for Theoretical Physics at Leiden University, and the School of Physics at the Georgia Institute of Technology. He received his PhD in 2011 from the University of Pennsylvania working with Tom Lubensky on descriptions of granular media, mechanical metamaterials, and colloids.

Discussion leader: **Dominic Vella**, University of Oxford

Extreme Mechanics Letters (EML) seeks to publish research of immediacy, depth, and originality.