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沖縄科学技術大学院大学

VISITING PROGRAM

TSVP TALK

Topology, Memory and Flocking in Biological Tissues: How Mechanical History Guides Coherent Collective Migration

2026
THU. **Nov. 18**

13:30–14:30

HYBRID L5D23, ZOOM



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How can a tissue of dormant cells rapidly switch to coordinated movement, as during wound healing? We study the onset of epithelial flocking, where cells spontaneously align their motion to form coherent, directional migration. Stresses stored during tissue quiescence generate aster-like patterns and traveling domain walls. These structures promote topological defect annihilation, driving collective ordering. We develop an active elastic model to reproduce experimental defect coarsening and reveal how memory can guide defect motion and tissue migration. Our findings suggest a generic mechanism through which mechanical memory can shape collective dynamics and self-organization in active solids.



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Luiza Angheluta

Luiza Angheluta is Professor of Physics at the University of Oslo. Her research focuses on theoretical and computational approaches to nonequilibrium soft matter, with particular emphasis on topological defects, collective dynamics, and emergent pattern formation. Her work spans different topics in active matter systems and liquid crystals physics, superfluid flows, and crystal deformations. It combines statistical physics with interdisciplinary approaches to complex systems across the physics and life sciences.

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