# Dr. Hervé Turlier
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## Bridging Fluorescence Microscopy and Biophysical Tissue Models

**May 19 (Mon) 15:00-16:30**
**Room 16-107, 16th bldg. Komaba + Zoom**

Fluorescence microscopy is a key tool for studying biological systems, yet extracting physical insights from 3D images remains challenging. Meanwhile, tissue models are becoming increasingly sophisticated, but direct integration with imaging data is still limited.

   In this talk, I will present our recent efforts to bridge this gap. I will introduce our computational foam-like tissue models, which incorporate viscous dissipation, cell division, and mechanochemical feedback. Then, I will present a segmentation and 3D tension inference method that generates detailed mechanical atlases of embryos and tissues from microscopy images. Finally, I will showcase a fully differentiable optimization pipeline that links mechanical models to microscopy by generating realistic synthetic images from simulations, paving the way for solving inverse mechanical problems. I will conclude with perspectives on integrating AI with biophysical models to uncover cell behavior in development.
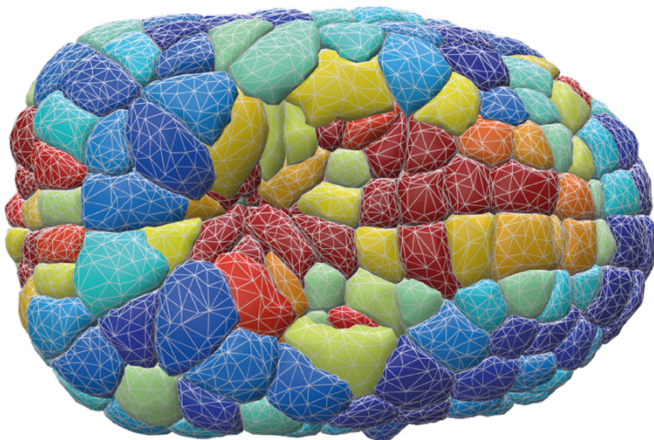


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**Zoom:**