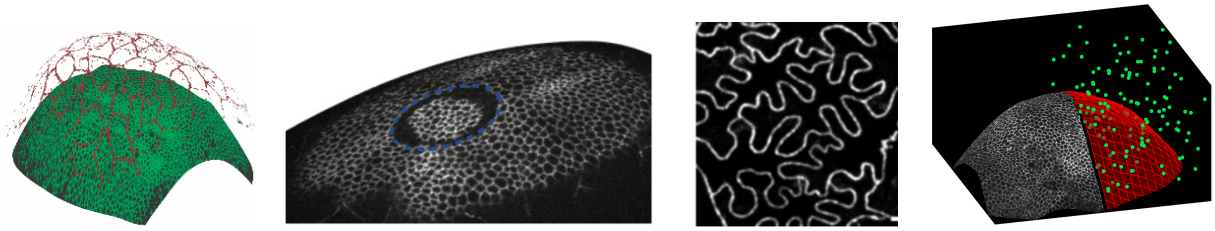

# One funded position (PhD or Postdoc)

## Building a smart microscope to image fast biological processes in 3D

Institut Fresnel, Marseille, France

We seek **a young researcher** in the context of our project **Temporal Smart-Scan**, which aims at developing a smart microscope for the imaging of biological tissues**.**
Scanning fluorescence microscopes play a crucial role in biology, but their slow speed and intrinsic phototoxicity can be problematic for 3D tissue imaging. In this project, our objective is to design a "smart" microscope whose acquisition strategy is guided by real-time learning and statistical data processing. This system will autonomously determine where and when to perform acquisition, utilizing the gathered information to reconstruct fluorescence density. The optimal acquisition strategy of the system will accelerate imaging and reduce phototoxicity. The benefits of this approach will be demonstrated through imaging rapid morphogenetic processes during Drosophila development.

This project lies at the intersection of applied physics, data science, and developmental biology. The successful candidate will work on the experimental implementation of the microscope, closely collaborating with data science specialists for algorithmic aspects and applying it to the study of tissue morphogenesis in Drosophila.

We are looking for a candidate with the following qualifications:
- A Master's or PhD degree in applied physics, biophysics, data science, or a related field.
- Experience in the development of optical instruments, particularly in the field of optical microscopy.
- Proficiency in programming (MATLAB, Python) and image processing.

Depending on their interests and personal preferences, the candidate can focus on instrumentation, data science developments, or biological applications. Interested applicants are invited to submit a letter of interest, a CV, and contact information for two references to Loïc Le Goff (loic.le-goff@univ-amu.fr )

*Selected publications from the group on the subject:*

Abouakil et al.(2021). An adaptive scanning strategy for the imaging of biological surfaces. Light: science and applications 10, 210 (2021). DOI: 10.1038/s41377-021-00649-9
Ackermann et al.(2022). Modeling the mechanics of growing epithelia with a bilayer plate theory. EPJ Plus 137:8. DOI: 10.1140/epjp/s13360-021-02205-1
Burcklen et al. (2022). Optimizing sampling for surface localization in 3D-scanning microscopy. JOSA A doi: 10.1364/JOSAA.460077
Meng et al. (2023). Adaptive scans allow 3D-targeted laser dissection to probe the mechanics of cell sheets. BioRxiv https://doi.org/10.1101/2022.01.30.478374