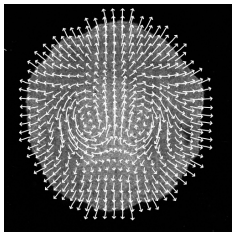
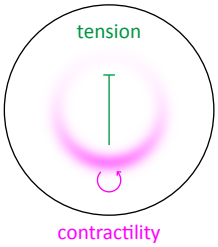
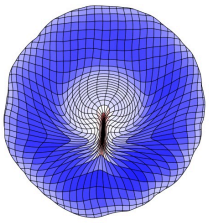
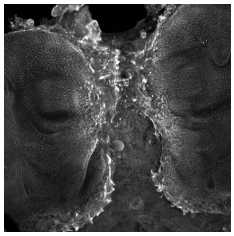
Postdoctoral openings in theoretical biophysics at Ecole Normale Supérieure in Paris

Embryonic self-organization / Guided tissue migration

We are seeking applications for two postdocs to work on projects at the interface between physics and developmental biology, in close collaboration with experimentalists.


Mechanics of embryonic self-organization

How molecular and mechanical cues combine to coordinate the morphogenesis and patterning of developing embryos is an open question. Collaborating with the group of Jérôme Gros (Institut Pasteur), we have combined quantitative experiments and modeling to identify the engine of morphogenetic movements in the early avian embryo - a tensile ring [1]. Our findings hint that mechanical forces also function as a signal in embryonic self-organization, which is very prominent in avians since a bisected embryo can give rise to two complete embryos. To test this, we will in particular examine how mechanical forces, tissue movement, and gene expression are redirected upon mechanical perturbations such as cutting.

A postdoctoral position funded by ANR and ERC grants for up to 5 years, to be hosted jointly by ENS and Institut Pasteur, is available immediately. The project will involve the analysis of experimental data and development of models to investigate the mechanical basis of embryonic regulation, in close interaction with experimentalists at Institut Pasteur.

[1] Saadaoui et al, A tensile ring drives tissue flows to shape the gastrulating amniote embryo, *Science* (2020)

Contacts: Francis Corson (www.phys.ens.fr/~corson, corson@phys.ens.fr), **Jérôme Gros** (https://research.pasteur.fr/en/team/dynamic-regulation-of-morphogenesis, jgros@pasteur.fr)

Collective migration of *Drosophila* epithelial cells

The collective migration and eventual fusion of large groups of cells is critical for animal development, yet how coordinated motion arises from individual cell behaviors and external cues remains poorly understood. In collaboration with the group of Loïc Le Goff (Institut Fresnel, Marseille), we are studying the migration of *Drosophila* wing imaginal discs (~ 10,000 cells each), which merge along the dorsal midline of the body. Experiments and modeling will be combined to characterize the architecture and mechanical state of these tissues, and explore the interplay between cell movement and gene expression patterning as a possible mechanism for guidance.

Funding for a two-year postdoc, starting in the early Fall of 2020, is available from an ANR grant. The project will involve the development of analytical and numerical models to investigate the guidance and mechanics of imaginal disc migration, on the tissue and cellular scales, in close interaction with experimentalists at Institut Fresnel.

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Applicants for these two positions should have a strong background in physics and a clear scientific interest for biology. Applications, to be sent to the indicated contacts, should include a CV, a description of previous work and research interests, and contact information for at least two references. **Applications should be received by 31 March 2020** for primary consideration and will be considered until the positions are filled.