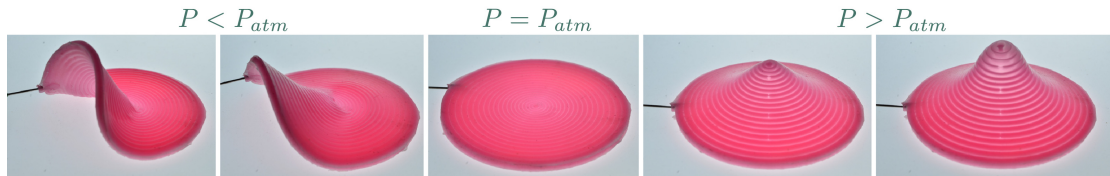


## Joint post-doc opening between ESPCI and ENS

We have a joint **postdoc opening** between the MecaWet lab @ PMMH and the Folding, Sliding and Stretching lab @ LPS in the area of **controllable multi-component elastic structures**, with a focus on **experiments**. The goal is to design materials whose **stiffness may be dynamically adjusted** and to explore their use to **rigidify morphable 3D structures**.



A “baromorph” elastomeric plate morphing into a saddle shape under air suction (left) and into a cone upon inflation (right).

**Description:** By embedding channels within an elastomer we have recently developed structures that change shape under applied pressure. However, their softness hinders applications to large scales. Adding a more rigid component can rigidify the structure, but in a non-linear fashion. The project consists of designing and prototyping multi-component elastic materials with tunable rigidity. The general idea is to control the relative contributions of compliant and stiff components with a third active phase. The goal is to rationalize the fundamental aspects of the problem, to produce bulk materials and to design morphable / rigidizable structures. This multidisciplinary project is at the interface between structural mechanics, fluid dynamics, soft robotics and nonlinear physics.

**Profile:** Candidates should have recently obtained or are about to obtain a Ph.D. in Physics, Mechanical/Civil/Aerospace Engineering, or related disciplines. The project is primarily experimental but also includes some theory and numerical computations. On the experimental side, expertise in rapid prototyping, micro-fabrication, material science, and/or mechanical testing is welcome. In addition, an appreciation for scaling analysis, theory and computation is a plus.

**Hosting teams:** The successful candidate will participate in a collaboration between two laboratories who study problems in fluid and solid mechanics in conjunction with other disciplines: non-linear physics, instabilities, out-of-equilibrium statistical physics, multi-scaled phenomena, geomorphology, planetology... Their research involves a combination of laboratory experiments, theory and numerical simulations.

Although the project is fundamental in nature, we envision applications for medical equipment and, more generally in applied science.

The laboratories are both located in the Latin Quarter, in the center of Paris, which offers state-of-the-art facilities and a unique scientific environment.

**Funding:** Funding for one year is available (through an ANR grant) and we expect the candidate to help us find additional funding for a second year.

More details on our scientific activities can be found here:

<https://blog.espci.fr/jbico/recherche/> for the MecaWet lab @ PMMH

[www.lps.ens.fr/~foldingslidingstretchinglab/](http://www.lps.ens.fr/~foldingslidingstretchinglab/) for the Folding, Sliding and Stretching lab @ LPS

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**Applications received by December 1st, 2018 will receive equal consideration.**