

# INTERNSHIP PROPOSAL

Laboratory name: Laboratoire Matières et Systèmes Complexes (MSC)

CNRS identification code: UMR 7057

Internship director: Dražen ZANCHI

e-mail: drazen.zanchi@u-paris.fr

Phone number: 06 78 95 47 25

Web page: <https://msc.u-paris.fr>

Internship location: Laboratory MSC, Paris

Thesis possibility after internship: YES

Funding: YES

If YES, which type of funding: ANR

## ***Bionics of filamentous structures***

Our research includes, on the one hand, the biomechanics of organisms and filiform supramolecular structures with high sensitivity to environmental stimuli and, on the other hand, studies of bio-inspired artificial systems as well as combined devices between the living and the artificial. This project within the MSC laboratory is based on a new phenomenon recently published by our group [Dilly, 2023]. It is a “soft engine”, based on the inversion of a helix. In our research, we are (bio)inspired by climbing plants, by the flagella of microalgae, filamentous algae, or even by functional supramolecular structures like amyloid fibers. Then, we propose bionic devices, hybrids between living and artificial.

The student intern will mainly work on the experimental part within the MSC laboratory, both on living and synthetic systems with Dražen Zanchi on site and in collaboration with **Julien Derr** (Lab. Rep. Dev. Plantes, ENS, Lyon). From a thesis perspective, the theoretical part is in collaboration with **Sébastien Neukirch** (d’Alembert Institute for Mechanics, Paris).

**Any new ideas and daring initiatives are welcome!**

