

---

## Internship position 2019

### Applied Mathematics and Engineering Sciences

(Possibility to pursue with a PhD)

---

## Topic

### Particles in the environment: dynamics and statistics of re-mobilization

---

---

#### Expected profile

- 3<sup>rd</sup> year master student in applied mathematics, physics or mechanical engineering
- Good experience in programming (C, C++) and in data analysis
- Fluent in english

#### Optional competences

- Knowledge in fluid dynamics
- Knowledge in statistical physics
- Rigorous, autonomous and creative thinking
- Interest in environmental applications

---

#### Duration and period

5-6 months (between February and August 2019).

---

#### Host institution

[Inria Sophia Antipolis - Méditerranée](#)

---

#### Supervisors

- [Mireille Bossy](#) (Inria research director), specialist in stochastic modelling;
- [Christophe Henry](#) (Inria starting researcher), specialist in particle-laden flows.

---

#### Key words

Lagrangian stochastic models, Numerical analysis, particles, agglomeration, fragmentation.

---

#### Description

Particles are omnipresent in the environment, such as in atmospheric sciences (pollutant dispersion) or in marine sciences (plastic contamination in oceans). These particles can accumulate on surfaces (pollutant deposit on the ground, plastic debris on riverbanks). Due to the action of the flow, such particles can be detached from surfaces and brought back into the flow: this process is often referred to as resuspension in multiphase flows.

The aim of this internship is to develop a new model for the re-mobilization of particles. For that purpose, the student will extend a recent approach that has been developed for small colloidal particles (i.e. smaller than a few  $\mu\text{m}$ ). The doctoral student will participate to the development of state-of-the-art numerical tools, perform simulations, analyze and validate results.

This internship can lead to publications in international journals.

Motivated candidates will also be encouraged to pursue with a PhD on a related topic ([detailed proposal](#)).

---

#### To apply

Please send an email to both:

- [mireille.bossy@inria.fr](mailto:mireille.bossy@inria.fr)
- [christophe.henry@inria.fr](mailto:christophe.henry@inria.fr)

Applicants are required to send a cover letter, a CV, transcripts of their Master grades, and at least one recommendation letter to the above address.