



# Ultrastructural Expansion Microscopy (UExM)

## Type of the project

Master project (PdM)

## Laboratory

Dudin Lab (UNIGE)

To be determined (EPFL)

## Professor

Omaya Dudin

To be determined (EPFL)

## Supervisor

Bénédicte Lunven, vice-présidente pour la science frugale à Sailowtech

## Student

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### Context

Atlantea, Sailowtech's first 10-month expedition around the North Atlantic, has collected plankton samples in the Caribbean and Greenland for analysis using expansion microscopy. A total of 24 samples were collected (6 in the Caribbean and 6 in Greenland, all in duplicate). Expansion microscopy is a new, non-selective technology whose aim is to expand very small plankton (between 50 and 200 micro-meters) and then image them in 3D using a microscope. The aim is then to be able to recognize plankton species and internal structures (visible thanks to fluorescent colors).

In conjunction with plankton sampling, a CTD line (conductivity, temperature and depth probe) was taken at each sampling site to provide an environmental context.

### Description of the project

Samples were taken at the following locations:

- Martinique: 1 coastal day sample, 1 coastal night sample, 1 offshore sample
- Guadeloupe: 1 coastal day sample, 1 coastal night sample, 1 offshore sample
- Qeqertarsuaat (Greenland): 1 daytime fjord sample, 1 night-time fjord sample, 1 coastal/offshore sample
- Uunartoq (Greenland): 1 fjord sample during the day, 1 fjord sample at night, 1 coastal/offshore sample

The idea of the project is first to identify the different plankton and their internal structure. Then, various comparisons can be made, such as day/night, coastal/wider, Martinique/Guadeloupe, Caribbean/Greenland, etc.

### Calendar

The student's main project steps will be to

- Imaging plankton



- Identification of plankton species
- Identification of internal structures
- Comparison between samples

### Deliverables

- Plankton images
- Summary report
- Oral presentation at the intermediate project presentation session organized by Sailowtech and/or with the associated course.
- Oral presentation at the final project presentation session organized by Sailowtech and/or with the associated course.

### Documentation and bibliography

- Sampling notebook
- CTD data
- Photos of sampling sites
- Protocol equipment photos

### Planned interaction with Sailowtech

By completing a project with Sailowtech, the student automatically becomes a member of the association. He/she will take part in meetings (around 7 during the semester) to share the progress of his/her project with his/her supervisor and, if necessary, to discuss any project-related needs. In addition, as a member of the association, the student may participate in various activities organized by the association. A project follow-up document is set up between the association and the student, and must be completed every week.

The student must work with his or her supervisor to store, tidy and protect materials correctly.

### Contact

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