

## Master thesis project:

### ‘Does light mediate bacteria-phytoplankton interactions?’

#### Master-thesis background

Phytoplankton, oceanic photosynthetic unicells, contribute approximately 50% of the world’s primary production and form the basis of all aquatic food webs. Phytoplankton blooms threaten ecosystems and support bacterial growth; dead phytoplankton sink and sequester CO<sub>2</sub> in the ocean. The growth, death, and interactions of phytoplankton thus play a huge role in global biology and climate, but their basic biology remains surprisingly poorly understood.

One example is how light influences phytoplanktonic life. While light is essential to the survival of phytoplankton it can also act as a stressor, if experienced at too-high intensities. In this project, the student will use our unique and cutting-edge microscopy and environmental experiments to investigate how light mediates phytoplankton health, and whether the health status of individual cells does affect bacterial behavior. The data gained from this project will significantly advance our understanding of phytoplankton-bacteria interactions, feeding forward into increased understanding of these global-scale processes. There is also an opportunity to connect these observations with exciting new theory connecting environment and evolution with our collaborators in Norway.

#### Master-thesis project description and aims

In this master thesis, you will use our unique, cutting-edge automated microscopy in combination with advanced cell tracking to measure the effects of light on phytoplankton-bacteria interactions.

#### Methods

In this project, you will learn the following methods:

- Basic microbiology
- High-throughput automated fluorescence microscopy
- Tracking single-cell movements in large image datasets
- Transferrable statistical and data science approaches

You should be a master-level student with some experience in e.g. image analysis, microscopy and/or phytoplankton and a keen interest for interdisciplinary science.

Students from all walks of life and backgrounds are welcome to apply!

**Have a look at what else we are up to:** <https://behrendtlab.com/>

**Interested?** Please contact Lars Behrendt, [lars.behrendt@scilifelab.uu.se](mailto:lars.behrendt@scilifelab.uu.se). The scope of the project is a 45-60 hp master thesis