

# PhD position

## Development of a hands-on fluorescence method for estimation of phytoplankton primary production



**Hosting Lab:** UMR INRAE CARRTEL –Research Centre on Lake Ecosystems and Food Webs, Thonon les Bains, France



**Supervisors:** Serena Rasconi, INRAE CARRTEL, France  
Gabriel Acien Fernandez, Univ Almeria, Spain  
Antonio Idà, Algalia, Italy



© Carrtel



© Algen

**PhD Topic:** Primary production is a fundamental process and an important indicator of the aquatic ecosystem functioning. Different methods exist for the estimation of this parameter, mainly based on *in situ* sample incubations to obtain measures of oxygen production/consumption and direct carbon uptake. Chlorophyll (chl) *in vivo* fluorescence can constitute a valuable alternative for assessing photosynthetic performance. It can be measured directly on raw samples without the need for laborious laboratory protocols. With this simple method high rate of data collection can be afforded, allowing measures to be related to physical forcing and functional response of aquatic communities.

A recent important application is also in the industrial-scale valorisation of algae biomass as biomarker for culture viability and easy tool for monitoring the production yield.

However, in spite of these advantages, fluorescence-based measures and conversion factors need to be consolidated to link photosynthetic efficiency estimates to biomass production and ecosystem metabolism. Using estimates of primary production with different proxies ( $^{13}\text{C}$  uptake and Pulse Amplitude Modulated fluorescence) in natural communities from Lake Geneva, in algae cultured in laboratory controlled conditions and from algal biotechnology production facilities, this project aims to develop a hands-on method based on chl fluorescence for the estimation of the primary production applicable in complex natural ecosystems (e.g. lakes) and algal biomass industrial plants (e.g. open ponds and bioreactors).

**Candidate profile:** We seek a highly motivated, independent and creative student with good background in aquatic ecology and algal physiology. Previous experience with ecological monitoring methods would be an advantage.

**Candidature submission:** To apply please send an email with a CV, a one-page motivation letter and a supporting letter or a reference contact to [serena.rasconi@inrae.fr](mailto:serena.rasconi@inrae.fr)

**Deadline for submission of applications: 31.08.2024** - Selected candidates will be invited for an interview with the supervisors on 03.09.2024 or 09.09.2024