

LadHyX Seminar – January 12, 10:45 – LadHyX library

Hélène de Maleprade,
∂'Alembert, Sorbonne Université

Swimming strategies according to the shape of green algae

Microscopic algae are commonly found in mud, puddles or lakes, and show great diversity in structural complexity. One of the simplest algae encountered is the unicellular *Chlamydomonas*, exhibiting two flagella whose beating enables them to swim in a breast stroke. One also finds *Gonium*, a colony made of 16 *Chlamydomonas*-like cells arranged in two concentric squares, with all flagella on one side of the plate. The largest spherical colony within the family is *Volvox*, hosting several thousands of *Chlamydomonas*-like cells. These colonies are among the first multicellular algae and their study offers an insight into the evolution from unicellular to coherent multicellular behaviour.

Algae, like plants, get energy from photosynthesis: they take advantage of their motility to swim towards light, efficiently reorienting within a few seconds. However, the mechanism of this phototactic behaviour is not straightforward: how do cells individually produce a coherent collective response? In this talk, I will present and compare how *Chlamydomonas*, *Gonium* and *Volvox* exploit their specific shapes to propel efficiently and evolved an optimal strategy to swim to the light.