



## SLAM Seminar

# Collective photoprotection through light-induced phase separation in a phototactic micro-algae

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Excess of light can be hazardous for photosynthetic organisms. When intensity is too high, the motile micro-algae *Chlamydomonas reinhardtii* therefore reorients itself to swim away from the incident light. We recently discovered that a suspension of such migrating cells can be unstable, whereby small spatial fluctuations in cell density can quickly trigger the phase separation of the system and the formation of dynamic branching patterns, whose features depend on the global cell density, light intensity and medium viscosity. This new kind of instability can be understood from the strong coupling between cell density and light fields through both negative phototaxis and light absorption by the individual cells. Our model captures the destabilization of the system for critical control parameters and finely reproduces the experimental data. On the physiological side, as a consequence of light absorption, we have shown that algae inside dense areas are protected from the light stress, showing that on short timescales, phototaxis efficiently contributes to photoprotection through non-trivial responses at the population level.

**Thursday, April 20, 2022 11:00 - 12:00**  
Big Seminar Room B (big) I23.EG / Sunstone Building



This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage: <https://ist.ac.at/en/campus/how-to-get-here/> The IST Shuttle bus is marked IST Shuttle (#142) and has the Institute Logo printed on the side.