



## Announcement

# Advanced seminar: Collective Systems in Biology

## Description

Biological systems at all levels, from individual cells to plants and animals to ecosystems evolved to self-assemble from basic unit building blocks. While creating complex phenomena, these self-assembly processes can often be quantitatively understood in terms of physical models. In this seminar we will have a closer look at some interesting examples.

## Learning Outcomes

Students who attended this seminar

- got to know exciting examples of biological self-assembly
- learned how simple physical models can give rise to complex biological phenomena

## Content

In this advanced seminar we will cover the following topics:

- pattern formation (embryo development, bacterial division, animal colouring, etc.)
- swarm behaviour (fish swarms, path optimization by ants, constructions by social species, etc.)
- competition between species (real-live rock-paper-scissors games)
- molecular self-assembly (DNA origami, artificial molecular machines)
- ...

## Prerequisites

Formal prerequisites: none

Recommended prerequisites: basic physics lectures

## Literature

- Textbook chapters
- Review articles
- Original research articles

## Additional Information

The module refers to bachelor and master students

## Lecturer

Prof. Christof Gebhardt, Institute of Biophysics