

# Statistical and Biological Physics

Module No.: MN-P-SP-StatBio, MN-P-PN-StatBio, MN-P-WaMa

Version: 21.06.2017 BM

## Course: Experiment and simulation on biological systems

Lecturers: B. Maier and J. Berg

Email: [berenike.maier@uni-koeln.de](mailto:berenike.maier@uni-koeln.de); [berg@thp.uni-koeln.de](mailto:berg@thp.uni-koeln.de)

Category	Type	Language	Teaching Hours	CP	Semester
Specialized Course	Advanced Laboratory Course & Lecture & Seminar	English	3	4.5	WiSe

### Requirements for participation:

Experimental physics at bachelor level, Introduction to Biophysics is recommended  
Computational Physics at bachelor level or working knowledge of a programming language

### Type of module examinations:

Oral examination or report

### Duration of the course:

1 week (full-time) during the semester break

### Application:

The number of participants is limited to 8. The application deadline will be announced on the webpage [biophysics.uni-koeln.de](http://biophysics.uni-koeln.de).

### Aims of the course:

In this advanced course detailed experiments in evolution, genetics, cellular decision making, and gene expression will be conducted. The course consists of both "wet" lab experiments and computer simulations on the same topics. Similarly, lectures on the biological background will be presented both from the experimental and the theoretical perspectives. At the end of the course, participants will present their work to the other participants. Participants of this course get hands-on experience with state-of-the-art experimental and computational techniques in biological physics.

### Contents of the course:

- Conducting evolution experiments
- Modelling population genetics and evolution
- Measuring and modelling gene expression
- Statistical analysis of experiments

### Recommended literature:

- Nowak, M., Evolutionary Dynamics, Belknap Press, 2006
- Phillips, R., Kondev, J., Theriot, J., Physical Biology of the Cell, Garland Science, New York, 2012
- Additional literature will be announced during the course