IMPRS UFAST Focus Course
Numerical Methods and Practical Skills for Computational Physics (Part II): *Numerical Methods in Computational Physics*

## Lecturers: Heiko Appel, Henning Glawe

Hands-On exercises: Hans Fangohr, Henning Glawe, Nicolas Tancogne-Dejean, and Heiko Appel

Abstract:

Theory and experiment have been the two pillars of science that for centuries have underpinned our understanding of the world around us. With the advent of powerful computers, computational methods have emerged as a third pillar of science. Among other techniques, numerical methods, data analysis, and visualization have become indispensable tools for many scientists nowadays. This course intends to introduce basic numerical methods which allow to perform numerical simulations on modern computing platforms.

Topics include:

- Root finding and solving nonlinear equations
- Numerical differentiation and integration
- Solving ordinary and partial differential equations
- Solving linear systems of equations
- Eigenvalue problems
- Optimization
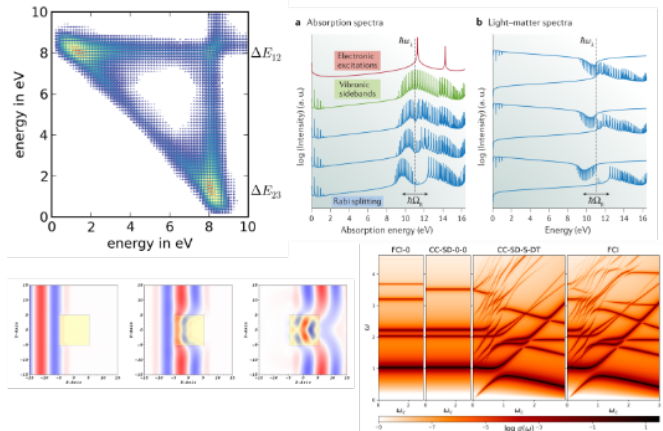
In addition, in the course we provide hands-on exercises for participants to gain experience with high-performance computing environments. Basic Python knowledge, as for example provided by the course "Introduction to Programming with Python for Computational Science" is recommended for this course.

Online course
19th – 23rd February 2024
09:00 h – 13:00 h
Register on Geventis I-UF FC3-2