

SAOT Summer Academy

Waischenfeld, July 25-29, 2022

Course A - Basics of Optics

Course leader: Dr. Martin Hohmann (LPT, FAU)

English Version of OPTEC lecture (Basics of Optics according to SAOT Credit Point System)

This course is the English version of the course OPTEC, which during the winter semester is taught by Professor Schmidt in German language. As the successful completion of OPTEC or an equivalent lecture is mandatory for SAOT members, this English course is particularly attractive for SAOT members with weak or no German skills. You can take the OPTEC exam after the end of the course or sit for the ordinary examination offered after the lecturing period of the upcoming winter semester. If you pass the examination, you can earn 5 SAOT CPs. If you fail, you earn no CPs.

Course B – Collaborative workshop: Writing papers and theses on optical technologies – Concepts, Texts, Figures

Course leader: Dr. Max Gmelch (SAOT, FAU)

In this seminar we will focus on the publications you are currently working on. This includes both scientific papers and theses. We will speak about general tips and hints regarding drafting and writing, as well as creating expressive figures. Furthermore, we will spend a lot of time on your individual topics. Currently drafting a manuscript? Bring it to the seminar! Struggling with a figure? Share it with the group! A certain paragraph just doesn't fit? Let's discuss about it! Each evaluation of your individual issue is a benefit for the whole group. By the end of the week, all of your topics should have been addressed and your publication may have taken a big step forward.

Course C – Optics development with ZEMAX OpticStudio

Course leader: Dr. Volker Türck (Dr. Türck Ingenieurbüro GmbH, Berlin)

The aim of the course is to give an insight into optical design and to present the basics of working with modern optics software based on examples. The focus is on the development of optical imaging systems. The presentation of the software OpticStudio concentrates on the so-called sequential mode.

Day 1

- Basic terms for the description of optical systems
- Basics in the use of OpticStudio
- Construction of sequential systems with paraxial lenses
- Imaging with real lenses, description of real lenses in OpticStudio
- Description of imaging errors
- Classification of aberrations (Seidel aberrations)
- Important properties of optical glasses

Day 2

- Basics of automatic optimization
- Introduction to automatic optimization of optical systems in OpticStudio
- Optics with mirror surfaces
- Design of more complex, non-axial optical systems

Day 3

- Diffraction in Zemax
- Global optimization, optimization of glass types
- Gaussian beams and beam propagation

Day 4

- Design projects as team exercise

Day 5

- Design projects as team exercise
- Discussion of the exercise task and questions of the participants
- Outlook: Further steps in the design process