

Registration Form

Further Training Seminar Advanced Lens Design

18th – 21st October 2023 in Aalen

Binding registration by mail to info@photonicsbw.de

The participation fee is 1790,- €. For members of Photonics BW e.V. and for members of the other regional Innovation Networks Optical Technologies belonging to OptecNet Deutschland e.V. the participation fee is 1090,- €.

The fee includes the participation in the seminar, the training documents, lunch and dinner as well as coffee breaks and beverages in the seminar room. **Accommodation costs are not included.** We gladly reserve a room at **H+ Hotel Limes Thermen Aalen** (99,- € / night with breakfast).

After receipt of the registration, you will get a confirmation of your participation. The seminar is limited to **a maximum of 20 participants.**

Cancellations are accepted only in written form, cancellation fees: free of charge until 6th September 2023. After that, the full participation fee is to be paid. If you are not able to attend the seminar, we gladly accept another participant. We reserve the right to cancel the seminar if the number of participants is too small. The seminar is subject to the terms and conditions of Photonics BW (www.photonicsbw.de/agb).

Enterprise, Institution

Title, First name and Surname

Street, Number

Zip code, Location

Phone Number

E-Mail

Date, Signature

- Member of Photonics BW e.V.
- Member of another regional Innovation Network Optical Technologies belonging to OptecNet Deutschland e.V.
- I need a license for OpticStudio (time-limited).
- I would like to book a single room from _____ to _____

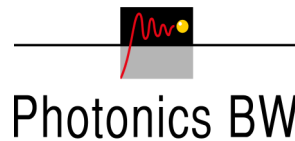
Goals of the Seminar:

- > **Target group:** Engineers, physicists, technicians, project manager and scientists with basic knowledge in optical design and the application of the software OpticStudio.
- > **Learning objectives:** The seminar combines theoretical knowledge about optical design for imaging systems with the transfer into practical solutions. The participants improve their knowledge and will be qualified for a broad range of challenging applications in lens design.
- > **Theory and Applications in 3½ days**

Venue
H+ Hotel Limes Thermen Aalen
Osterbacher Platz 1
73431 Aalen

Organizer
Photonics BW e.V.
Innovation Network Optical
Technologies and Quantum
Technologies

Anton-Huber-Straße 20
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www.photonicsbw.de



Photonics BW e.V. is a non-profit innovation network driving forward the photonics and quantum industry and research in Baden-Württemberg and beyond.

Other Seminars (in German):

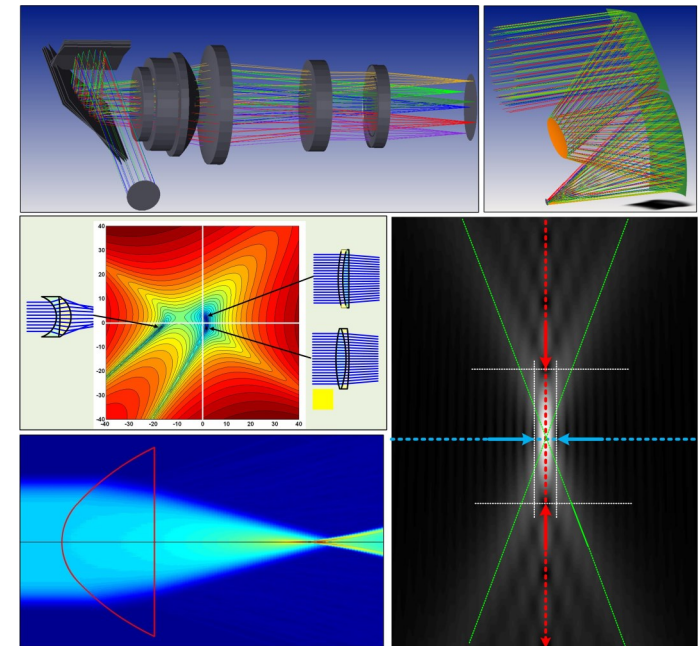
- > **Grundlagenseminar Optische Systeme: Design und Simulation**
in Blaubeuren bei Ulm
- > **Beleuchtungsoptik: Entwicklung und Anwendung**
in Weingarten
- > **Praktische Lichtmesstechnik und Optische Charakterisierung von Displays**
in Pforzheim

Further information: www.photonicsbw.de/weiterbildung

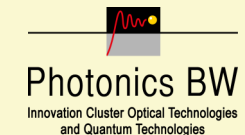
Optical Systems: Design and Simulation

Advanced Lens Design

Further Training Seminar



18th – 21st October 2023
Aalen



Seminar

Optical design is a key technology for innovations in medical and biotechnology, automotive applications, industrial manufacturing, mechanical engineering, space technology, lithography and consumer applications.

Optical systems become more and more complex with increased functionality and further specific optimization. This trend results in a growing demand for the qualification and competence of optical designers. In addition to the basic seminar „Optische Systeme: Design und Simulation“, Photonics BW offers the seminar „Advanced Lens Design“ for extending and deepening the knowledge in lens design.

Concept

- > The seminar combines theoretical knowledge about optical design for imaging systems with the transfer into practical solutions. The participants improve their knowledge and will be qualified for a broad range of challenging applications in lens design.
- > Intensive coaching and assistance by the lecturing team.

Target Group

The target groups are engineers, physicists, technicians, project manager and scientists with basic knowledge in optical design and the application of the software OpticStudio.

The seminar is limited to a maximum of 20 participants. For a successful participation, you should bring your laptop with an installed license of OpticStudio (version 2017 or newer). If you need a time-limited license during the seminar, please inform Photonics BW by mail at: info@photonicsbw.de

A detailed schedule is found on the webpage www.photonicsbw.de

Content

Theory und Methods

- > **Advanced aberration theory:** Higher orders, induced aberrations, sine condition, pupil aberrations, isoplanatism
- > **Optimization and correction:** Method of optimization, special approaches for correction, global algorithms, glass selection, structural changes, stop position, field lenses
- > **Chromatical correction:** Achromatization, special achromates, apochromatic systems, spherochromatism, lateral chromatical aberrations, new achromate, dialyte and Schupman lenses
- > **Correction methods:** Lens bending and splitting, aplanatic surfaces, AC lenses, symmetry, wide angle approaches, sensitivity
- > **Field flatness:** Petzval theorem, correction of image flatness
- > **Tolerancing:** Types of tolerances, Monte-Carlo simulation, realistic quality estimation, tolerancing aspheres, thermal degradation

Special Components

- > **Aspheres:** Types of surface description, Forbes aspheres, spherical correction, optimal location of aspheres
- > **Freeforms:** Motivation, representation of surfaces, optimization, aberrations and quality assessment, aspects of realization
- > **Diffraction elements:** Diffraction and efficiency, modelling approaches, aberrations and correction, false light

Selected Applications

- > **Simple systems:** 4f systems, relays, endoscopes, eyepieces, scan lenses
- > **Microscopic systems:** Principle, objective lenses, tube optics, confocal systems, illumination aspects, stereo microscopes
- > **Photographic systems:** Overview, classification, system types, special features
- > **Mirror systems:** Basic properties, telescopes, freeform solutions

Seminar Coaches



Prof. Dr. Herbert Gross worked from 1982 to 2012 in the optical design department of Carl Zeiss, which he headed for 14 years. From 2012 to 2022, he was appointed as a professor for optical system design at the Friedrich-Schiller University of Jena. He is the editor and main author of the 5-volume book series „Handbook of Optical Systems“. He serves as a lecturer in the seminars of Photonics BW since 2003. His main areas of interest are physical optics and beam propagation, coherence theory, lens design methods, aberration theory and freeform systems.



Dr. Yi Zhong works at Carl Zeiss in lens design since 2020. Between 2014 and 2019, she was doctorand student and postdoc in the group of Prof. H. Gross in Jena. She assists also in lecturing and coaching of students. Her special areas of knowledge are aberration theory, micro optics and freeform systems.



Dr. Dennis Ochse is a leading lens designer at Jenoptik in the range of freeform optics. He designed scan systems, microscopes, cameras and anamorphic systems in industrial projects and founded research projects. His special interests are aberration theory, and system correction. Before he started his industrial career, he studied mathematics in Marburg and Kaiserslautern.



Dr. Ziyao Tang is currently working at Carl Zeiss AG as optical system engineer since April 2022. After her master graduation at the Friedrich-Schiller University Jena, she joined the research group of optical system design of Prof. Herbert Gross in 2019 and received her doctoral degree in 2022. Her major research direction covers aberration theory, genetic optimization algorithm and freeform optics.