

Short Course Description

Course Title

High Power, High Brightness Laser Diode Technology

Course Description

During the past two decades high power laser diodes have paved their way into multiple applications besides the field of telecommunication. The course will present an overview of the state of the art in high power semiconductor laser technology. Typical applications addressing market segments such as material processing, printing, medical, defense, homeland security as well as telecommunication will be described in the introduction.

The terminology of high power laser will be discussed in detail defining the frame of the course. Pertinent devices and current challenges in the design of high power lasers will be investigated. In this context the course reviews materials used for the most common operation wavelengths, design approaches for the active region and the related waveguide structures. Recent findings on efficiency improvements will be evaluated as well as brightness enhancement and robustness for the most important high power laser geometries (i.e. single mode single emitters, multi-mode single emitters and laser diode bars). In addition reliability aspects and their measure will be reviewed. Since the success of high power laser design depends critically on the integration into subsystems the course will also explore some selected packaging concepts and their impact on the laser system performance. Various device examples will be presented during the course describing the current state of the art in this industry.

Benefits and Learning Objectives

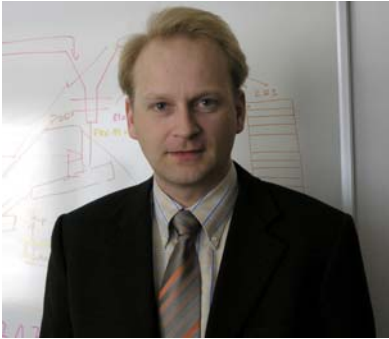
This course should enable you to:

- Summarize the major applications for high power laser diodes
- Identify the most relevant wavelengths and materials for those applications
- Compare different design approaches for high power laser diodes
- Discuss the challenges and limits of today's semiconductor laser diodes at extreme working conditions
- Identify relevant packaging concepts for the device integration
- Describe major trends for future developments

Intended Audience

The course addresses itself to participants with a general background in semiconductor laser physics. It is directed to people interested in extending their knowledge in the field of high power laser diodes and the related applications. The course will help participants to understand key aspects in the design of those devices which should enable the audience to follow papers given on this topic during the conference.

Instructor Biography



Berthold Schmidt graduated from the Julius-Maximilians Universität at Würzburg, Germany. He received the M.Sc. from SUNY University at Albany, USA, and the Dr.rer.nat. degree from the Technical University at Munich, Germany. He possesses over 14 years of professional experience in the field of laser diodes working for Siemens, JDSU, Nortel and Bookham, respectively. He holds various patents on the design of high power laser diodes and has (co)authored about 60 papers, conference papers and book chapters. Berthold Schmidt is member of the SPIE, SSOM and IEEE.