

## Overview

**The Erlangen Graduate School in Advanced Optical Technologies (SAOT) was established at the University of Erlangen-Nuremberg in November 2006 within the framework of the Excellence Initiative of the German Federal and State Governments to Promote Science and Research at German Universities.**

The scientific focus is placed on optics and optical technologies which are key technologies of the 21<sup>st</sup> century with a strong impact on nearly all areas of life. Applications of optical technologies in science and industry are found, for example, in information and communication technology, in process engineering, in production engineering, in energy and environmental technology and in medicine. Optical technologies form an interdisciplinary framework for scientific enterprise with important scope for innovation at the interfaces between the disciplines of physics, engineering and medicine.

The SAOT stands for

- **Excellence**
- **Internationality**
- **Interdisciplinarity**
- **Innovation**
- **Leadership**

in research and education in optical technologies. The actual topics of particular interest are given in the Curriculum.

*Winter Academy 2008*



## Curriculum

The interdisciplinary character of optical applications represents a challenge and an opportunity to physicists, biologists, physicians and engineers. While they often use similar optical methods when working in their own disciplines, the realization of synergy effects demands close cooperation and technology transfer.

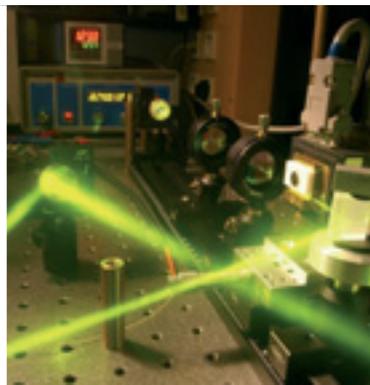
Based on the fundamentals of optics, the main topics in the research and education programme covered by the SAOT are:

- **Optical Metrology**
- **Optical Material Processing**
- **Optics in Medicine**
- **Optics in Communication & Information Technology**
- **Optical Materials and Systems**
- **Computational Optics**

Students with a wide range of backgrounds when joining the SAOT will be prepared for successful research programmes in a Graduate School Entrance Academy. Passing the examination at the end of this academy is obligatory for final admission to the SAOT.

The SAOT provides an interdisciplinary research and education programme in which innovation and leadership are promoted within an expanded international network of outstanding researchers.

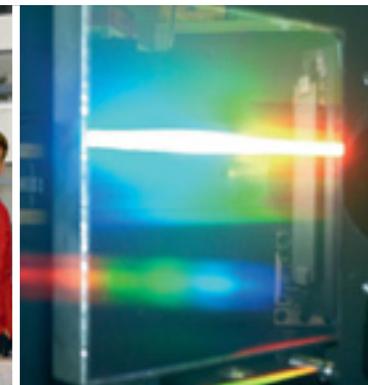
*Refraction and reflection of a laser beam on an optical table*



*Scientific discussion*



*Dispersion of white light on a grating*



*Team work*



An important feature of the education and research in the SAOT is a series of international workshops on selected aspects of the six topics with experts from around the world. Summer and winter academies, project discussion groups, specialized courses and soft skills training projects also form parts of the SAOT programme. In a worldwide network, internationally renowned scientists act as instructors, guest professors or hosts for doctoral candidates during internships lasting 3 to 6 months abroad.

## Organisation

The SAOT is jointly run by three schools of the University of Erlangen-Nuremberg

- School of Engineering
- School of Science
- Medical School

It is supported by different research centres in Erlangen, e.g.,

- Bavarian Laser Centre (BLZ)
- Fraunhofer Institute for Integrated Systems and Device Technology (IISB)
- Max Planck Institute for the Science of Light (MPL)
- Bavarian Center for Applied Energy Research (ZAE)

## Admission

The Graduate School invites applications from excellent graduate students in engineering or natural sciences (particularly physics) from Germany and abroad. Students should hold a Master degree, a German Diplom or a comparable academic qualification. A very good command of English is essential. Applications can be submitted at any time. Students will be selected by the scientific committee of the SAOT on the basis of a formal application and an interview either in person or by telephone.

Candidates with a Bachelor degree can enter the Elite Master Programme in Advanced Optical Technologies as a preparatory step for research work in the SAOT. A fast track programme is provided for exceptionally capable students holding a Bachelor degree.

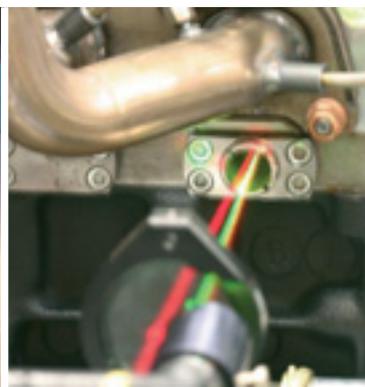
## Financial Support

Successful applicants to the SAOT will be offered either a scholarship or a research position at one of the participating institutions. There are no tuition fees at the SAOT.

**Laser cutting  
of thick metal sheets**



**Laser based thermometry  
in an internal combustion  
engine**



## Board of Directors

Prof. Dr.-Ing. A. Leipertz (Coordinator)  
Prof. Dr.-Ing. M. Schmidt (Co-coordinator)  
Dr.-Ing. A. Bräuer (Director of Administration)

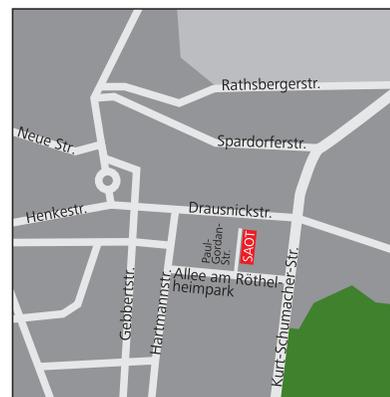
## Contact

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**SAOT offices, built in 1910 and renovated in 2000–2008**

The SAOT is located near the centre of Erlangen and is readily accessible by bus, car or bicycle.



# 21<sup>st</sup> century – the century of the photon

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Leadership**