Optics & Photonics

Optics & Photonics are key technologies of the 21st century. They form the basis for today’s optical communications, environmental sensing, biomedical diagnostics in the life sciences, energy efficient lighting and solar energy harvesting.

Karlsruhe School of Optics & Photonics

In 2006, the Karlsruhe School of Optics & Photonics (KSOP) was founded as the first Graduate School of the Karlsruhe Institute of Technology (KIT) as part of the German „Excellence Initiative“. KSOP provides a multidisciplinary environment for first-class research and education as well as for the generation of innovative technologies in Optics & Photonics. Comprising both master’s and doctoral program, the educational concept is designed to qualify graduates for accelerated careers at world leading academic institutions and in high-tech industries.

Today, KSOP’s membership is comprised of over 700 Master students, Ph.D. students and alumni from 40 different countries.

Ph.D. Program

The Karlsruhe School of Optics & Photonics offers a 3-year Ph.D. program in one of the research areas: Photonic Materials & Devices, Advanced Spectroscopy, Biomedical Photonics, Optical Systems, and Solar Energy.

KSOP provides Ph.D. candidates with an optimal research environment at the Karlsruhe Institute of Technology (KIT) to carry out first rank Ph.D. projects in the multidisciplinary field of Optics & Photonics. Integrated into the graduate school, doctoral researchers pursue their projects autonomously.

Since successful careers in industry and academia often require leadership and interdisciplinary knowledge, emphasis is laid on management skills, which are taught as mandatory management modules within KSOP. In addition, there are also technical, scientific and personal key competence modules.

To support their endeavor, two independent advisors and a mentor accompany the research work of the doctoral researcher. All Ph.D. positions are financed - either by KSOP scholarships or other sources.

In addition to that, KSOP fosters an active network amongst its members - active or alumni. A scientific exchange with international peers and leading scientists is facilitated through events and international conferences.

Research Areas

There are five KSOP Research Areas (RA). Most institutes feature research projects from more than one area.

Photonic Materials & Devices

Research in new materials-, synthesis-, and deposition technologies fosters new designs of photonic materials and devices, e.g., luminescent nanoparticles, organic films, or photoresists.

Quantum Optics & Spectroscopy

Spectroscopy plays a crucial role in uncovering and characterizing novel quantum and nonlinear phenomena molecular photophysics or atmospheric chemistry.

Biomedical Photonics

Biomedical photonic technologies are crucial for noninvasive clinical monitoring, molecular diagnostics, or imaging of physiological parameters in living cells, humans, and whole organisms.

Optical Systems

Sensing and machine perception systems, laserbased manufacturing, and production monitoring are examples where optical materials and devices are integrated into real-world applications.

Solar Energy

The conversion of solar radiation into electrical energy might one day cover the major part of the electricity supply. Light management by means of tailored plasmonic or dielectric structures can reduce costs of the future solar electricity.
Voices of Alumni

Dr. Sarah Krämmer
“I joined the KSOP Ph.D. program because it gave me the opportunity to connect with scientists from different research areas in Optics and Photonics and to start research projects with them. Furthermore, the module trainings offered by KSOP were highly useful since I could expand my scientific knowledge and skills with them but also could gain insights into different fields with the management modules. Especially the latter is very helpful for my current job outside academia.”

Dr. Radwanul Siddique
“KSOP did not only educate me in different branches of optics through interdisciplinary scientific trainings but also gave me an exposure to state-of-the-art facilities. I was able to span my research across computational optics, imaging and spectroscopies, and nanofabrication with the support of KSOP researchers and affiliated institutions that resulted in high impact scientific findings. To current and future KSOPians, KSOP has a lot to offer, so please utilize the resources and be open to collaboration and science – ‘the more you share, the more you learn’ - that’s what I learnt in KSOP!”

Dr. Tobias Großmann
“KSOP has supported me from the beginning of my Ph.D., starting with a scholarship. In addition, my work benefited from contacts to scientists in the optics field which were mediated by KSOP and lead to several fruitful collaborations with other institutes within KIT.”

More voices can be found on our website or on YouTube.

Key Data & Benefits

- 3-years Doctorate Program
- Research Areas: Photonic Materials & Devices, Quantum Optics & Spectroscopy, Biomedical Photonics, Optical Systems, Solar Energy
- Modular Training in Management, Technical, Scientific and Key Competencies
- Scholarship Program
- Supervision & Mentoring Concept, National and International Networking

Start: Individual | Language: English | Application: Any Time
Optional: MBA Fundamentals Program for Doctoral Researchers

Contact & Application

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