

# **Quantum Technologies: from basic research to industry**

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Quantum effects not only provide deeper insights into fundamental physics, but can also be exploited to advance a broad range of technologies. They promise higher precision in sensing and metrology, a new computing paradigm, fundamental advantages in secure communication and much more. Inventing these protocols and applications is one of the great tasks for theorists, while the experimental challenge is to gain full control over the employed quantum systems. Their reliable production and manipulation at the quantum level often requires either the most advanced classical technologies or even a new generation of devices. We are currently witnessing an exciting transition of quantum technologies from academic labs into industry, as can for example be seen from the quickly growing number of quantum technology startups.

TOPTICA Photonics is deeply rooted in the quantum technology community from which it emerged more than 20 years ago. Since then, TOPTICA develops and manufactures high-end laser systems for scientific applications and industrial applications. In my talk, I will present some of the opportunities and challenges TOPTICA faces by providing enabling technologies for the rapidly developing market of quantum technologies and give examples of TOPTICA's direct involvement in this new field, e.g. the development of an optical atomic clock.

Last but not least, my own career path serves as a good example for the entanglement between academic research and industry. I will sketch how my curiosity for quantum effects and enthusiasm for technology took me from developing a laser as a student at Universität Hamburg to research on ultracold quantum gases at ETH Zurich, to building quantum networks at MPQ in Munich, and to finally become TOPTICA's Application Specialist for Quantum Technologies.