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A quarter of a century of innovation

Toptica's pioneering journey in laser technology

Taking-off as a startup with three persons in 1998, Toptica's vision was to humbly add its tunable diode lasers to the field of scientific photonics and to make a living for around ten people within five years. Today, the company has achieved way more than that: Toptica does not only offer a plethora of different products but has become a global leader in photonics with nearly 550 employees worldwide and annual sales of 130 million euros.

More than twenty-five years ago, the founders of Toptica echoed a simple idea which would carry them into the center of the photonics industry: "The market for our cutting-edge research products is going to come. We just wait and be ready when it does!" It was a daring statement at the time, yet one that has been vindicated spectacularly.

In 1998, Wilhelm Kaenders and his colleague Thomas Weber founded TuiOptics as a technology spin-off of TuiLaser. In 2001, the company was renamed to Toptica Photonics and converted to a stock corporation. Kaenders was already enthusiastic about cold atomic physics as a doctoral student at the Institute of Quantum Optics in Hanover, inspired by Theodor Hänsch's group at the Ludwig Maximilian University of Munich and the Max Planck Institute in Garching. Starting Toptica as a company with scientific tunable diode lasers was the right decision at the time. Frequency 'division' then and frequency 'combing' today have triggered the fascination of ultimate precision with scientists. Transferring radio frequency thinking and control techniques into the optical domain pushed accuracy and precision by multiple orders of magnitude. This ambition is still the driving force of the Toptica product range on its way into new markets.

A success story written in lasers

Over the years, Toptica's lasers became the hallmark for manipulating ultracold atoms in atom and molecular physics laboratories globally. Today, the company has sold more than 10,000 tunable diode lasers and has grown into a globally recognized specialist in research lasers in general. In 2004, the addition of fiber laser technology opened the laser technology box even further, adding substantial industrial business to the mix. Today, Toptica boasts six subsidiaries in five different countries.

◀ Toptica supports quantum technology research at the University of Saarland: six laser rack systems, two DFCs, and many Toptica lasers for atom-atom entanglement over 20 km of fiber.

Wilhelm Kaenders, founder and CTO, underscores the transition, in saying: "We still share the language, the application know-how, and the passion with the scientists, but we also learned to understand and meet the industry's specific requirements." This dual understanding enables Toptica to reliably manufacture products in very high quantities.

The quantum revolution: a long, exciting journey

Quantum technology has undergone unparalleled growth and significance over the last quarter of a century, validated by receiving several Nobel Prizes in Physics. Toptica has not just been a spectator of this journey but an active participant and, being able to recruit field leaders into its growing team, often a trailblazer. The publication of the Quantum Manifesto in 2016 marked a significant milestone for quantum technologies and Toptica as one of its industry leaders.

As part of the European Union's Quantum Flagship Program, Toptica remains the only European company which has made initial contributions to all four pillars of quantum technology: communication, computing, and simulation as well as metrology and sensing. This participation shows the company's commitment to propelling the field into its promising future.

Facing the next chapter

The rise of quantum technology and photonics as disciplines of global economic and security relevance marks the commencement of an international race. Governments, research institutions, and companies globally invest enormous financial and intellectual resources. "Toptica is proud to be part of this journey. We are poised to adapt and lead our laser technology to the needs at hand as we have always done. With a continued average annual growth rate of around 15 per cent, we look forward to the next twenty-five years with optimism and an unquenchable thirst for innovation", Wilhelm Kaenders reports with pride. "Here's to the next twenty-five years that promise extraordinary growth, innovative products, and transformative solutions for both the economy and society. Thank you for being part of Toptica's remarkable journey. Let us continue to push the boundaries of what is possible in photonics and quantum technology."

In 2001, Wilhelm Kaenders (left) and Thomas Weber proudly present their latest laser system as joint presidents of the newly founded laser system manufacturer Toptica.

Adolf Giesen, Helmut Hügel, and Wilhelm Kaenders (from left to right) talk on the occasion of the Leibinger Prize 2002 award ceremony.

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