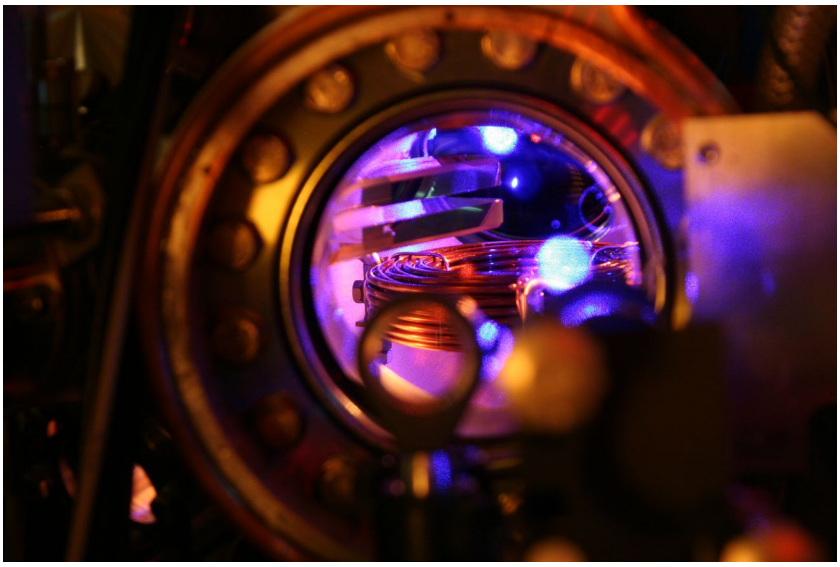
New Light Sources for the Second Quantum Revolution

ams OSRAM, Fraunhofer IIS, and TOPTICA present joint project DigiQuant for digitalization and miniaturization of laser diode technology for quantum and terahertz applications.



Symbol picture: Strontium Lattice Clock – Blue fluorescing cloud of strontium atoms (arrow) that have been laser-cooled to milli-Kelvin temperatures.
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Diode-laser-based technology is a key enabler for quantum optics. Within the DigiQuant project new laser diodes will be developed at ams OSRAM, which are suitable for hybrid integration of photonic waveguides and digital control electronics at TOPTICA.

In parallel, the miniaturization of electronics in integrated circuits for digitized operation of any material class laser diodes from diverse manufacturers will be investigated with Fraunhofer Institute for Integrated Circuits IIS and TOPTICA. The miniaturized and digitized subsystem will be tested in two different applications, a quantum computer application and in an industrial application to readout a digital code with a hand-held scanner.

Bringing quantum computers to market

These combined developments will enable the implementation of complex laboratory technology in portable and robust devices with high wall plug efficiency for industrial use and help to scale up quantum computers and take them from the basic research stage to market maturity.

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About the project partners

ams OSRAM is a global leader in optical solutions. We offer a unique product and technology portfolio for sensing, illumination, and visualization: from prime-quality light emitters and optical components to micro-modules, light sensors, ICs and related software.

The Fraunhofer Institute for Integrated Circuits IIS conducts world-class research on microelectronic and IT system solutions and services. Today, it is the largest institute of the Fraunhofer-Gesellschaft.

TOPTICA develops and manufactures high-end laser systems for scientific and industrial applications. The portfolio includes diode lasers, ultrafast fiber lasers, terahertz systems and frequency combs.