

Prof. Kasper Van Gasse – Universiteit Gent**Title:**

Chip-scale solid-state lasers for scalable quantum systems and metrology

Abstract:

The group of Prof. Kasper Van Gasse is researching a new generation of chip-scale solid-state lasers, pushing beyond the limitations of diode integration to deliver laboratory-grade performance in scalable platforms. Our work targets the key light sources needed for quantum technologies: ultra-narrow linewidth lasers for quantum computing, tunable sources for quantum networking, novel wavelengths for quantum sensing, and chip-integrated femtosecond lasers for optical clocks.

We are advancing hybrid integration strategies by transfer-printing titanium:sapphire, exploring rare-earth-doped platforms, and developing on-chip saturable absorbers for true femtosecond operation. By uniting power, stability, and spectral control at the chip scale, LASIQ aims to establish integrated lasers as a foundational technology for quantum systems and precision metrology, bridging the gap from lab to real-world deployment.

Short bio:

Kasper Van Gasse is an Associate Professor in the Photonics Research Group at Ghent University and imec, where he leads the ERC Starting Grant project LASIQ on chip-scale solid-state lasers for metrology and quantum systems. He received his MSc in Engineering Physics (2014) and PhD (2019) from Ghent University, where his work on photonic integrated circuits for 5G networks earned the 2020 Nokia Bell Scientific Award. Following a postdoctoral fellowship at Ghent University and imec, he joined the Max Planck Institute of Quantum Optics, collaborating with Theodor Hänsch and Nathalie Picqué on integrated dual-comb lasers. As a Belgian American Educational Foundation fellow, he worked at Stanford University in Jelena Vučković's group, where he co-demonstrated the first thin-film titanium-sapphire nanophotonic laser platform.