



# Mid-infrared Fourier transform spectroscopy with chip-scale thermal- and frequency comb emitters

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## Biography

**Prof. Lukasz Sterczewski, Ph.D.** is an Assistant Professor at the Wroclaw University of Science and Technology, where he leads cutting-edge research in optoelectronics and spectroscopy. As the Principal Investigator of the prestigious ERC Starting Grant project "TeraERC," he focuses on developing chip-based room-temperature terahertz frequency comb spectrometers. Prof. Sterczewski's expertise lies in laser physics, semiconductor laser frequency combs, and THz wave generation, with applications spanning from gas spectroscopy to non-invasive diagnostics. Prof. Sterczewski has a distinguished international research background, including postdoctoral fellowships at NASA's Jet Propulsion Laboratory and a visiting researcher position at Caltech. His work has advanced cavity-enhanced optical sensing and the application of frequency comb technology for space exploration and pharmaceutical diagnostics. During his doctoral studies at Wroclaw University of Science and Technology and Princeton University, he explored innovative signal processing solutions and chip-scale laser systems.

## Abstract

We will discuss the spectral coverage and resolution enhancement of room-temperature Fourier transform spectrometers. Using chip-based laser frequency comb sources, commercial instruments with cm-scale interferometers can now measure spectra with MHz resolution. We also show that using a custom-built instrument with broadband optics, we can cover the whole mid-infrared, longwave infrared, and much of the THz range when an incoherent chip-sized thermal emitter is used.



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