Seminar/Talk

Harnessing Light-Sound and Nonlinear Interactions in Integrated Photonics

Gustavo Silva Wiederhecker
The University of Campinas, Sao Paulo | BR

Host: Johannes Fink

Integrated photonics is rapidly expanding its capabilities by leveraging both lightsound interactions and engineered nonlinear optical processes. In the first half of this talk, I will discuss how stimulated Brillouin scattering (SBS) in advanced material platforms like lithium niobate and lithium tantalate offers new opportunities for narrow-linewidth lasers, signal processing, and quantum transduction. By taking advantage of these materials anisotropic properties, we can design photonic systems where polarization and crystal orientation become powerful tools for tunability and performance enhancement.In the second half, I will explore how the concept of coupled resonators, or photonic molecules, provides a unifying design strategy for controlling nonlinear optical processes on-chip. This approach enables us to tailor the spectral and dynamical properties of devices for applications such as degenerate optical parametric oscillation and optomechanics. Together, these advances demonstrate how a combination of material engineering and coupled-resonator design can unlock scalable and multifunctional integrated photonic systems for future quantum and classical technologies.

Friday, July 18, 2025 10:00am - 11:00am
Office Bldg West / Ground floor / Heinzel Seminar Room (I21.EG.101)

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.
Please find a schedule of the ISTA Shuttle on our webpage:
https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.