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Harnessing optical non-linearities with integrated photonic structures

Tuesday, 5 September 2023 11:00 (1 hour)

Abstract: The confinement of light in optical microguides and cavities enables us to achieve exotic regimes of nonlinear optics, even with low power levels. Specifically, by recirculating light in optical microcavities, the intensity of the stored field can be increased by thousands of times compared to the incident field, resulting in amplified interaction between light and matter. In this lecture, I will introduce fundamental concepts on this subject and review our recent progress in this area, with a focus on new findings, such as the investigation of nonlinear dynamics of vibrational modes and the generation of novel optical and mechanical frequencies. Additionally, I will discuss their implications in second-generation quantum technologies.

Lecturer: Gustavo Wiederhecker holds an Associate Professor position at the University of Campinas, his research laboratory targets at harnessing nonlinear optical phenomena within microphotonic devices, with emphasis in the interaction between light and mechanical waves. He has been elected an affiliate member of the Brazilian Academy of Sciences for the 2019-2024 term. Before joining University of Campinas in 2011, he earned his B.Sc and Ph.D degrees in Physics from the same University and has been a postdoctoral fellow at Cornell University from 2008-2011. His Ph.D thesis has been awarded with the “Grande Prêmio CAPES José Leite Lopes” on 2009. (Text informed by the Lecturer).

Presenter: Prof. WIEDERHECKER, Gustavo (Gleb Wataghin Institute of Physics of the University of Campinas, IFGW-UNICAMP)

Session Classification: Introduction to the Photonics World