



InfraRed Optical Nanostructures

IR^{ON}

Invitation to the IR-ON Seminar

Tunable Optical Microcavities for Sensing and Communication

Garrett Cole

Institute for Quantum Optics and Quantum Information
Austrian Academy of Sciences

Research into optical microcavities has resulted in the development of a number of high-performance photonic devices. In this area, the vertical-cavity surface-emitting laser has emerged as the most successful commercial example, with typical applications including communications and optical sensing. Further functionality may be realized in these microcavity structures through the integration of microelectromechanical systems (MEMS). To date, MEMS have traditionally been fabricated in silicon via procedures borrowed from integrated circuit manufacturing. Progressing beyond traditional materials systems, constructing sensors and actuators from optically active compound semiconductors enables the pairing of micromechanics with the production, detection, and amplification of photons. Furthermore, this combination opens the door for fundamental studies of light-matter interactions on-chip. In this presentation I will discuss the development of two optically active MEMS devices: 1) a telecom-focused tunable vertical-cavity optical amplifier and 2) a tunable surface-emitting laser aimed at optical gas sensing. Finally, I propose that this technology may be readily applied to the emerging field of cavity quantum optomechanics, where integrated microcavities can enhance the coupling between a mechanical oscillator and a cavity field.

Host: W. Schrenk

Dienstag, 31. März 2009
17:15 Uhr s.t.

Floragasse 7, 1040 Wien
Seminarraum EG



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