ICT12-049 - Optomechanical systems as building blocks for optical and quantum information processing

Zusammenfassung

Information technology (IT) has rapidly advanced during the last decades. This progress was enabled by miniaturization, which is ultimately limited by the size of atoms. Then Moore's Law, predicting a constant growth of computing power, will break down. Only a paradigm shift in IT architecture may overcome this limitation. Optical computing and quantum information processing are two promising candidates to trigger the next IT revolution. Micro- and nano-optomechanical (OM) devices have the potential to play an important role in this development. They establish a new light-matter interface by exploiting optical forces in
micro- and nano-mechanical systems, hence providing a novel on-chip architecture at the interface of solid state and (quantum) optics. We will explore OM devices for engineering optical light fields and for performing quantum information protocols. The main objective of our research is to establish OM devices as a new building block for future optical and quantum IT.

Schlagworte:
Optical communication, Optical information processing, Quantum communication, Quantum information processing, Silicon photonics, Optomechanics, Quantum Optics, Micromechanics, Nanomechanics

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