Studies on optomechanics and nanomechanics.

**Objective**

To obtain new insights in the growing fields of optomechanics and nanomechanics.

**Summary of Research Activities**

- There is growing interest in opto-mechanics and nanomechanics. Our results provide new insights into the following problems: quantum back-action in nano-electro-mechanical systems, opto-mechanically-induced transparency in parity-time-symmetric micro-resonators, circuit analog of quadratic opto-mechanics, squeezed optomechanics with phase-matched amplification and dissipation, steady-state mechanical squeezing in an optomechanical system via Duffing non-linearity, enhancement of mechanical effects of single photons in modulated two-mode optomechanics, coherent manipulation of a Majorana qubit by a mechanical resonator, giant nonlinearity via breaking parity-time symmetry for low-threshold phonon diodes, noise suppression of on-chip mechanical resonators by chaotic coherent feedback, tunable multi-phonon blockade in coupled nano-mechanical resonators.

**Publications**


