

PMQ29 " Optomechanics and Electromechanics: Physics and Applications "

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Parrainage ou lien avec des sociétés savantes, des GDR ou autres structures :

Parrainage : GdR Optomécanique et Nanomécanique Quantique (MecaQ)

Autres liens : GdR Ondes Gravitationnelles, GdR IQFA, GdR Ondes, GdR Meso, GdR Graphene & Co

Résumé

Optomechanics is the field of physics that investigates the reciprocal interaction between mechanical motion and the electromagnetic field (1). Originally driven by questions such as fundamental processes in quantum measurements, and the extent of quantum principles to the macroscopic scale (2), the field has expanded to a variety of fundamental and technological challenges. These notably include nanomechanical sensors (3), quantum transducers(4), quantum hybrid systems (5,6), nano-phononics (7), ultra-fast opto-acoustic platforms (8), thermodynamics (9,10) and all the corresponding applications (11–14).

25 years after its emergence, Optomechanics establishes as an important field of research worldwide. The rapid and impressive progress, including the first demonstration of optomechanical systems operating in the quantum regime in the early 2010's (15,16), are driving major innovation and technological renewal, with a strong interdisciplinary impact.

The mini-colloquium 'Optomechanics and Electromechanics: Physics and Applications' aims at reviewing the interdisciplinary nature of our field, ranging from quantum devices for information technology to nanomechanical bio-sensing. It will also represent a unique occasion for early-stage researchers to discover the community and present their own contribution, opening new opportunities in a rapidly evolving field.

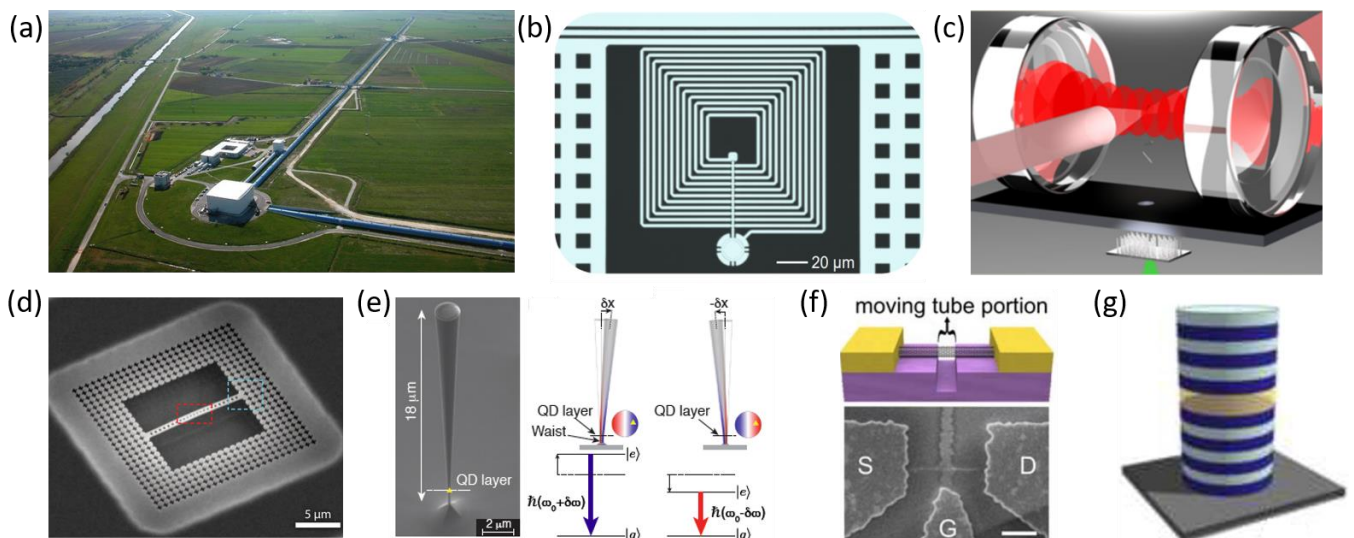


Figure 1 Optomechanics : from the kilometre down to the nanometre scale. (a) Photograph of the VIRGO interferometer (19). (b) Superconducting microwave mechanical circuit(18). (c) Levitated hybrid optomechanical system.(20) (d) Photonic crystal optomechanics(17). (e) Quantum dot optomechanical transducer (6). (f) Carbon nanotube nanomechanical mass sensor (12). (g) Ultra-high frequency phononic micro-pillar (8).

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