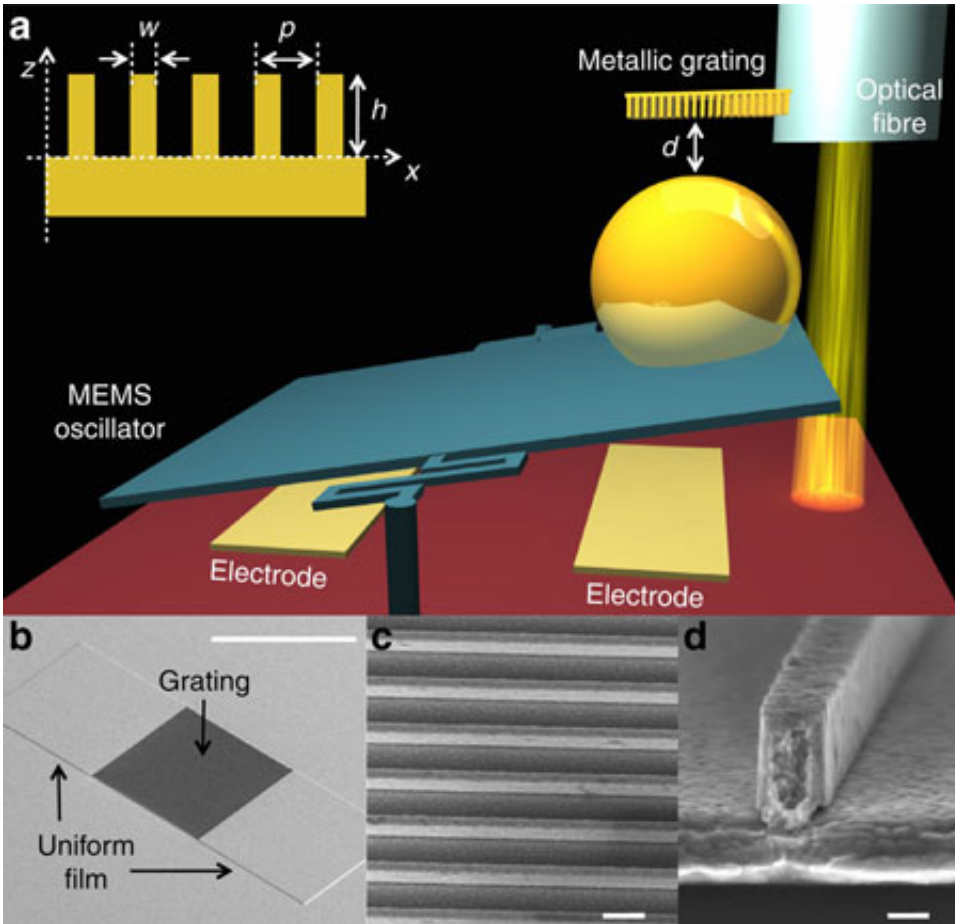


# New regime in the Casimir force observed

December 6 2013



(a) Configuration used to measure the Casimir force between a gold-coated sphere and a nanostructured grating. The sphere is attached to the torsional plate of a micromechanical oscillator and the nanostructured grating is fixed to a single-mode optical fiber. SEM images: (b) nanostructured grating limited by two uniform films (scale bar, 100  $\mu\text{m}$ ). (c) Magnified grating showing the high spatial uniformity (scale bar, 400 nm). (d) cross-section of a single grating element (scale bar, 100 nm).

By nanostructuring one of two interacting metal surfaces at scales below the plasma wavelength, a new regime in the Casimir force was observed by Argonne National Laboratory researchers in the Center for Nanoscale Materials Nanofabrication & Devices Group working with collaborators at NIST, other national laboratories, and universities. Replacing a flat surface with a deep metallic lamellar grating with

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