

Photonics Meets Mechanics in the Nanoworld

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Optomechanics has witnessed its great success in detecting the first ever gravitational waves produced by collision and merger of two black holes about 1.3 billion light years away, which confirms a major prediction of Albert Einstein's general theory of relativity and opens an unprecedented new window on the universe. Optomechanical systems have shown their unique advantages in fundamental research as well as practical applications in high-precision metrology, signal processing, and data communication. Optomechanical devices exhibit many variations with their sizes and mechanical masses spanning orders of magnitude. Going to the other end of the spectrum, the speaker will talk about his research group's experimental research of integrated nanoscale optomechanical and optoelectromechanical devices with pico/femtogram masses and gigahertz vibrational frequencies. These integrated devices hold great promise for many burgeoning areas in science and engineering, such as single-molecule detection, laser cooling, and quantum information processing.