David Reitze – Colloquium Seminar – November 20, 2024 – JOINT with FRIB/PA
California Institute of Technology

Title: Gravitational-wave Astrophysics: Taking Advantage of Nature's Hadron Collider

Abstract: Since the first direct detection of gravitational waves in 2015 from a pair of merging black holes, gravitational-wave astrophysics is opening a new window to the high energy universe. In particular, the simultaneous observation of the colliding binary neutron star system GW170817 in the gravitational wave and electromagnetic sectors produced fundamental insights into (among many other things) the nature of the neutron star equation of state and r-process nucleosynthesis.

This talk will cover the fundamentals of gravitational-wave detectors and how they work as well as present recent highlights from LIGO-Virgo-KAGRA observing runs with an emphasis on discoveries associated with GW170817. Time permitting, we'll look at the future generation of gravitational-wave observatories being planned for the next decade.