University of Crete
Department of Physics

Physics Colloquium

Thursday, 11 April 2019 | 17:00 – 18:00, Seminar Room, 3rd floor

The gravitational-wave astronomy: from the first results to the scientific potential of next data takings

Prof. Matteo Barsuglia
Institute Fresnel, APC, CNRS Astroparticule et Cosmologie, France

ABSTRACT

On September 15th 2015, the two LIGO interferometers detected the first gravitational-wave, produced by the merger of two black-holes. On August 17th 2017, the coalescence of two neutron stars, localized by the network LIGO-Virgo, allowed the most important multi-messenger observation campaign of the history. Among the main results of this new gravitational-wave astronomy: the demonstration that binary black-holes exist and they can merge, the discovery of a new population of stellar mass black-holes, the link between short gamma-ray burst and mergers of neutron stars, a new measurement of the Hubble constant, the measurement of the gravitational-wave speed and the measurement of the deformability of neutron stars. After a summary of the results obtained so far, I will describe the observational plans of the next years and the challenges associated with the improvements of the gravitational-wave detectors. I will focus the last part of this seminar on the scientific potential of the new data takings, for the astrophysics of compact objects, for the cosmology and for the tests of gravity.

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