

## ***From the first gravitational-wave detections to the multi-messenger astronomy***

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On September 2015, the 14<sup>th</sup>, the two LIGO interferometers had their first direct gravitational-wave detection. Since then, three other observations have been announced and the last one, on August 14<sup>th</sup>, 2017, has been a joint detection from LIGO and Virgo instruments. Three days later, a fusion of two neutrons stars has been detected in coincidence with a gamma-ray burst. This launched a campaign of observations by several telescopes in the sky area determined by LIGO-Virgo and allowed the identification of the host galaxy and the discovery of a *kilonova*. This event, observed by LIGO, Virgo, 70 telescopes and neutrino observatories, marks the beginning of the era of the multi-messenger astronomy. In this conference, I will present the observations accumulated during these last two years with gravitational waves and their consequences for fundamental physics, astrophysics and cosmology.

**December 2017, 11<sup>th</sup>**

**10h30**

**Amphitheatre Ponte**

**Saint Jerome Campus**

### **Invitation:**

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