ID de Contribution: **6** Type: **Oral presentation**

What role will binary neutron star merger afterglows play in multimessenger cosmology?

lundi 8 février 2021 16:30 (15 minutes)

Binary neutron star mergers offer a new and independent means of measuring the Hubble constant by combining the gravitational-wave-inferred source luminosity distance with its redshift obtained from electromagnetic follow-up. This method is limited by intrinsic degeneracy between the system distance and orbital inclination in the gravitational-wave signal. Observing the afterglow counterpart to a merger can further constrain the inclination angle, allowing this degeneracy to be partially lifted and improving the measurement of H_0. In the case of the binary neutron star merger GW170817, afterglow light-curve and imagery modeling thus allowed to improve the H_0 measurement by a factor of 3. However, systematic access to afterglow data is far from guaranteed. I will present models for emission and detection of gravitational-wave and electromagnetic radiation from binary neutron star mergers and realistic source population models. With these models, I will quantify whether afterglows will play a leading role in multimessenger cosmology, or whether they will be too rare to significantly contribute to the narrowing-down of the Hubble constant.

Field

Cosmology

Day constaints

Monday, Tuesday, Wednesday, Thursday, Friday

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Classification de Session: Talk

Classification de thématique: Astrophysics