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Exploiting binary neutron star mergers with a network of advanced gravitational-wave detectors.

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The unprecedented observation of a binary neutron star coalescence by the Advanced Virgo and Advanced LIGO gravitational-wave detectors offers the opportunity to cast new light on neutron stars and matter under the most extreme conditions. Furthermore, for the first time we were able to observe the engine that powers events such as gamma ray bursts.

After such a merger, a compact remnant is left over and its nature depends primarily on the masses of the inspiralling objects and on the equation of state of nuclear matter. The gravitational-wave signature of this remnant can give us a unique insight on the neutron stars equation of state.

Primary author: DI GIOVANNI, Matteo (TIFP)

Presenter: DI GIOVANNI, Matteo (TIFP)

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