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New Extraterrestrial Observations of the Dense Matter Equation of State¹

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Neutron stars host the densest stable matter in the universe. Accurately modeling their multi-messenger astrophysics relies on a detailed description of the equation of state above nuclear density. Astronomical observations, including binary pulsar dynamics, x-ray bursts and timing, and gravitational waves, can in turn be used to constrain the properties of this dense matter. I will present equation of state constraints from neutron-star merger observations by the LIGO and Virgo Scientific Collaborations, discuss how they complement other observations, and outline some future prospects connecting gravitational-wave astronomy with above-nuclear-density physics.

¹On behalf of the LIGO and Virgo Scientific Collaborations