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Constraints on the Neutron-Star Equation of State with Gravitational-Wave and Pulsar Observations PHILIPPE LANDRY, California State University, Fullerton, REED ESSICK, University of Chicago, KATERINA CHATZIIOANNOU, Flatiron Institute — Astrophysical observations of neutron stars in binaries and in isolation can provide complimentary information about the dense-matter equation of state. We combine recent gravitational-wave, x-ray and radio observations of neutron stars to place joint constraints on the properties of supranuclear matter, modeling the uncertain equation of state with a nonparametric Gaussian process. We exploit (i) measurements of tidal deformability from binary inspirals detected by LIGO and Virgo, (ii) simultaneous mass and radius measurements obtained by NICER from surface hotspot emission, and (iii) lower bounds on the maximum neutron-star mass from surveys of massive pulsars. We also make projections for future constraints on the equation of state based on a simulated population of astrophysical observations.

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