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New Constraints on the Neutron Star Equation of State

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The calculation of the equation of state (EOS) of nuclear matter beyond saturation density (n_{sat}) remains an open research problem. However, observations of neutron stars have proven crucial to the study of matter at these higher densities, especially since the detection of gravitational waves from binary neutron star mergers by LIGO and the determination of simultaneous mass-radius contours from pulse profile modeling by NICER have significantly constrained the EOS beyond n_{sat} . In addition, recent advances in the calculation of nucleon interactions from chiral effective field theory (EFT) determine the EOS up to 1-2 n_{sat} , providing an independent constraint. In this talk I will discuss our most updated EOS constraints from recent chiral EFT calculations and NICER data, including the pulsar J0437-4715, within an open-source Bayesian framework.

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