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Neutron Matter Properties and the Neutron Star Mass-Radius Relationship SANJAY REDDY, JOE CARLSON, STEFANO GANDOLFI, LANL — In the last few years a great effort has been made to constrain the symmetry energy of nuclear matter. Both heavy-ion collision experiments, and accurate mass analysis can be used to measure the symmetry energy, and its derivatives, near saturation density. Simultaneously impressive progress has been made in the astrophysical sector, and the mass/radius relation of neutron stars are starting to be probed in a quantitative way, giving significant constraints on the neutron matter equation of state. In this talk we will show how the symmetry energy of nuclear matter and neutron star properties are strongly correlated in microscopic theories, with connections arising from the three-body force acting between neutrons. Our calculations, based on Quantum Monte Carlo techniques, show how the three-body force constrains both the symmetry energy and neutron star properties so that they are very strongly interconnected.

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