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S-wave Pairing In Neutron Matter ALEXANDROS GEZERLIS, Los Alamos National Laboratory / University of Illinois, JOSEPH CARLSON, Los Alamos National Laboratory — Low-density neutron matter is a strongly paired system, with a pairing gap of the order of the Fermi energy. Several many-body schemes have been devised in an attempt to calculate this pairing gap, since an accurate calculation of neutron matter properties may be important to the physics of neutron stars and of neutron-rich nuclei. We have calculated the $T=0$ equation of state and pairing gap for low-density neutron matter (as a function of the Fermi momentum times the scattering length) using a Quantum Monte Carlo method. These results are compared with previous calculations, including a recent work that makes use of the Auxiliary Field Diffusion Monte Carlo method, and also with infinitesimal-range calculations relevant to cold-atom physics.

Alexandros Gezerlis
Los Alamos National Laboratory / University of Illinois

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