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**Quantum Monte Carlo and Neutron Star Matter Superfluidity**

ALEX GEZERLIS, University of Illinois / Los Alamos National Laboratory, JOE CARLSON, Los Alamos National Laboratory, VIJAY PANDHARIPANDE<sup>1</sup>, University of Illinois — The equation of state and pairing gap of neutron matter at low densities are important to the structure and cooling of neutron stars, and potentially to the surface properties of neutron-rich nuclei. We find that this system can be well described to significant densities using only the S=L=0 component of a realistic nucleon-nucleon interaction. Diffusion Monte Carlo results are reported for the equation of state and the pairing gap, and compared with BCS calculations and recent Auxiliary Field Diffusion Monte Carlo calculations for neutron matter.

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