Abstract Submitted
for the NWS19 Meeting of
The American Physical Society

**Predictions of the canonical-mass neutron star radius based on chiral effective field theory**[1] RANDY MILLERSON, FRANCESCA SAMMARRUCA, University of Idaho — Neutron stars are of great interest for studies in both astrophysics and nuclear physics. The central densities of these highly exotic objects can exceed several times normal nuclear density. In this work [1] we use a method for obtaining the radius of canonical-mass neutron stars (that is, stars with a mass of approximately 1.4 solar masses). We start with equations of state for beta-stable matter based on high-quality chiral two-nucleon forces and the leading chiral three-nucleon force up to moderately high density and then use polytropic extrapolation to extend the equation of state to higher densities. We find good agreement between our predictions and recent observational constraints, such as those from LIGO/Virgo measurements. [1] F. Sammarruca and Randy Millerson, J. Phys. G Nucl. Part. Phys. 46, 024001 (2019)

[1]This work was supported by the U.S. Department of Energy, Office of Basic Energy Science, under Award Number DE-FG02-03ER41270.

Randy Millerson
University of Idaho

Date submitted: 10 Apr 2019 Electronic form version 1.4