

Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Probing Parity Violation in Neutron Stars: I-Love-Q relations in dynamical Chern Simons Gravity¹ TORAL GUPTA, Montana State Univ, BARUN MAJUMDER, Indian Institute of Technology Gandhinagar, Ahmedabad, India, KENT YAGI, Princeton University, Princeton, New Jersey, USA, NICOLAS YUNES, eXtreme Gravity Institute, Montana State University, EXTREME GRAVITY TEAM — Could gravity be parity-violating? Although General Relativity has passed all tests performed to date, parity invariance has not been tested in the strong field regime. In this talk, I will describe neutron stars in a particular effective field theory that violates parity invariance: dynamical Chern Simons gravity. I will show that the moment of inertia (I), the tidal Love number and the quadrupole moment (Q) continue to satisfy approximately universal (equation of state insensitive) relations, when the dimensional coupling parameter of the theory is properly normalised. These relations can be used to probe parity violation in gravity using future gravitational wave and radio observations with advanced LIGO and SKA respectively, six orders of magnitude more stringently than current solar system bounds.

¹NSF CAREER grant PHY-1250636, NASA grants NNX16AB98G and 80NSSC17M0041

Toral Gupta
Montana State Univ

Date submitted: 03 Jan 2018

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