Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Astrophysical Implications of scalar-Gauss-Bonnet Gravity From Multimessenger Neutron Star Observations ALEXANDER SAFFER, KENT YAGI, Univ of Virginia — The spacetime surrounding compact objects provides an excellent place to study gravity in the strong, non-linear, dynamical regime. Here, the effects of strong curvature can leave their imprint on observables which we may use to study gravity. Recently, the Neutron Star Interior Composition ExploreR (NICER) provided mass and radius relations of an isolated neutron star (NS). These measurements, combined with tidal deformability gleaned from GW170817 have aided in the understanding of neutron stars (NS) in general relativity (GR). However, modified theories of gravity may behave differently in the strong field regime, leading to results which may differ from those in Einstein's theory. Here, we focus on comparing the results mentioned with new theoretical corrections to GR obtained from scalar-Gauss-Bonnet (sGB) gravity. Our goal is to determine whether the mass-radius relations as well as the Love-compactness relations can help constrain sGB given the observations from NICER and LIGO. In this talk, I will present the results of our study of sGB gravity and how these compare with the information gathered from NICER and LIGO. In addition to this, I will discuss the usefulness of this approach in placing constraints on sGB theory.

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Date submitted: 07 Jan 2021 Electronic form version 1.4