Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Are Scalar-Tensor Theories Ruled Out by Solar System Observations? DAVID ANDERSON, NICOLÁS YUNES, Montana State University, ENRICO BARAUSSE, Institut d'Astrophysique de Paris — With the advent of new observations that probe the strong-field regime, it is a crucial time to determine which extensions of General Relativity are worth constraining. Scalar-tensor theories are both simple and well-motivated alternatives, and some lead to an excitation of the scalar in the strong field (scalarization), while reducing to Einstein's theory in the weak field. Previous studies, however, have shown that, upon cosmological evolution, the scalar field is typically driven to values that are ruled out today by Solar System observations. In this talk, I resolve this issue by modifying scalar-tensor theories in such a way so that the scalar field is driven to values that do satisfy weak-field tests today after cosmological evolution. In addition, these theories preserve scalarization (spontaneous, dynamical, induced) in the strong field regime, for example allowing neutron stars to deviate significantly from the predictions of General Relativity.

David Anderson
Montana State University

Date submitted: 08 Jan 2016 Electronic form version 1.4