

Abstract Submitted
for the APR16 Meeting of
The American Physical Society

The Lore of the Hair¹ NICOLAS YUNES, Montana State University, KENT YAGI, Princeton University, LEO STEIN, Caltech — Stars can be hairy beasts, especially in theories that go beyond Einstein's. In the latter, a scalar field can be sourced and anchored to a neutron star, and if the latter is in a binary system, the scalar field will emit dipole radiation. This radiation removes energy from the binary, forcing the orbit to adiabatically decay much more rapidly than due to the emission of gravitational waves as predicted in General Relativity. The detailed radio observation of binary pulsars has constrained the orbital decay of compact binaries stringently, so much so that theories that predict neutron stars with scalar hair are believed to be essentially ruled out. In this talk I will explain why this “lore” is actually incorrect, providing a counter-example in which scalar hair is sourced by neutron stars, yet dipole radiation is absent. I will then describe what binary systems need to be observed to constrain such theories with future astrophysical observations.

¹I acknowledge support from NSF CAREER Grant PHY-1250636.

Nicolas Yunes
Montana State University

Date submitted: 28 Nov 2015

Electronic form version 1.4