Probing extreme gravity with x-ray burst oscillations

Hector O. Silva[1] and Nicolás Yunes[1]

[1] *eXtreme Gravity Institute, Department of Physics, Montana State University, Bozeman, MT 59717 USA*

The x-ray emission of hot spots on the surface of neutron stars is the prime target of the Neutron star Interior Composition Explorer (NICER). These x-ray pulse profiles not only encode information of the bulk properties of these stars, which teaches us about matter at supranuclear densities, but also about the spacetime curvature around them which teaches us about relativistic gravity. Can these observations be used to perform strong-field gravity tests? In this talk, we present the current results of an ongoing program to address this question. We show that (in principle) NICER can place constraints on scalar-tensor theories of gravity which are competitive relative to constraints with binary pulsar observations.