Abstract Submitted
for the TSF17 Meeting of
The American Physical Society

**Corrections imposed by the Schwarzschild spacetime on the parameter space and bound debris of tidal disruption events**[1] JUAN SERVIN, MICHAEL KESDEN, Univ of Texas, Dallas — Stars on orbits with pericenters sufficiently close to the supermassive black hole at the center of their host galaxy can be ripped apart by tidal stresses, with the resulting bound debris producing what is known as a tidal disruption event(TDE). We provide a self-consistent, unified treatment of TDEs by non-spinning black holes, investigating several effects of general relativity on the parameter space of the disruptions. We provide a new mapping procedure that translates TDEs between Newtonian gravity and general relativity, allowing us to better compare predictions in both gravitational theories. For deep encounters leading to full disruption in both theories, the stronger tidal forces in relativity imply that the star is disrupted further from the black hole and that the debris is therefore less tightly bound, leading to a smaller peak fallback accretion rate and thus fainter TDEs. We also present preliminary results from our new model for predicting the evolution of the bound stellar debris. The TDE literature often chooses to homogenize the debris, tracing only the most bound orbit to describe this evolution. We distinguish debris elements based on their binding energies and incorporate relativistic effects, comparing our results with those of the TDE literature.

[1]Alfred P. Sloan Foundation Grant No. FG- 2015-65299 and NSF Grant No. PHY-1607031

Juan Servin
Univ of Texas, Dallas

Date submitted: 18 Sep 2017 Electronic form version 1.4