Astronomy seminar 9/12/2018

Laura Shishkovsky:
Title: The MAVERIC Survey: Black Holes in Globular Clusters

Abstract: Globular clusters are expected to have large populations of stellar-mass black holes at early stages in their lifetimes. These stellar-mass black holes were long predicted to have been kicked out of globular clusters through gravitational interactions during the clusters' evolution, with some clusters retaining only one or two stellar-mass black holes and most clusters not retaining any. However, recent discoveries of stellar-mass black hole candidates in globular clusters have called this narrative into question. With the goal of assessing the frequency of accreting stellar-mass black hole systems in globular clusters, we have undertaken a deep radio continuum survey of 33 Milky Way globular clusters using the Karl G. Jansky Very Large Array. Here we present our method of selecting candidates, preliminary results, and implications for the dynamical formation of binary black holes observable as gravitational wave sources.

Ryan Connolly
Title: Neutron Star Crusts: Nature is Elusive
Abstract: Accreting neutron stars serve as natural laboratories for probing the physics of dense matter. By comparing various computational models against observations of neutron stars during and after accretion outbursts, we can infer properties of the star that we can't measure directly and test theories of nuclear physics in regimes we can't replicate in the lab. However, as our understanding of the relevant microphysics improves and models become more detailed, new challenges have appeared in fitting the observations of cooling neutron stars transients. I will discuss a few of these areas of tension between observation and theory, specifically related to the composition of the crust as well as the crust-core interface, and some possibilities for reconciling the differences moving forward.