WEEKLY CALENDAR

October 18, 2010

Departmental Colloquium

3:40 PM, Monday, October 18, 2010
109 Nicholson Hall

"Attometer Astrophysics: Gravitational wave astronomy with LIGO"

Sam Waldman
Kavli Institute for Astrophysics, Massachusetts Institute of Technology

Host: Gabriela Gonzalez

• Refreshments served at 3:15 PM in 232 (Library) Nicholson Hall •

The direct detection of gravitational waves will provide a revolutionary new probe of the most energetic processes in the universe. The 4 km long LIGO interferometers have demonstrated the sub-attometer displacement sensitivity ($< 10^{-18}$ m/Hz$^{1/2}$) required to place upper limits on a binary neutron star to beyond the Virgo galaxy cluster. Such mergers are thought to be the progenitors of short gamma-ray bursts and provide an ideal “golden event” signal for direct GW detection. We are now building a 2d generation detector, Advanced LIGO, to increase the detector sensitivity by an order of magnitude. Technically, this requires increasing the stored power 30-fold (to 750 kW), developing new low noise readouts, and lowering the seismic and thermal noise sources. After describing the physics underlying Advanced LIGO, I’ll conclude with a novel application of LIGO technology to study holographic spacetime noise.

ANNOUNCEMENT:

There will be no classes beginning Thursday, October 21 - 22, 2010 due to Fall Holiday. Classes resume on Monday, October 25, 2010 at 7:30 a.m.