Advanced Instrumentation Seminars

February 20, 2008
1:30 pm, 1st Floor
KAVLI Auditorium

Advanced LIGO
The Next Gravitational Wave Observatory

Guest Speaker –
Brian Lantz
Stanford University

The Laser Interferometer Gravitational-wave Observatory (LIGO) is an ambitious project to measure gravitational waves from astrophysical sources and use these measurements to open a new observational window on the universe. Caused by accelerating masses, a gravitational wave is a traveling disturbance in the metric of space-time. They were predicted by Einstein, but because of their small amplitudes, have not (yet) been directly measured. LIGO is a 4 km baseline, high-precision laser interferometer designed to detect these waves. I will describe the current LIGO project, and discuss Advanced LIGO, the proposed major upgrade to the current observatory. To measure strains (relative length changes) on the order of 10^{-22}, we are advancing state-of-the-art technologies on many fronts, including active seismic isolation, high power lasers, and optical systems designed to operated with over 800 kW of incident power. I will discuss some of these new advances, and describe plans for the next decade of gravitational wave astronomy.

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