



LUDWIG-
MAXIMILIANS-
UNIVERSITÄT
MÜNCHEN

ARNOLD SOMMERFELD
CENTER FOR THEORETICAL PHYSICS



Sommerfeld Theory Colloquium

Prof. Craig Hogan

University of Washington

The New Science of Gravitational Waves

A survey is presented of new science that will emerge during the decades ahead from direct detection of gravitational radiation. Interferometers on earth and in space will probe the universe in an entirely new way by directly sensing motions of distant matter over a range of more than a million in frequency. At low frequencies detectable in space with LISA, the universe is richly populated in powerful sources of gravitational radiation. The most powerful sources of gravitational (or indeed any form of) energy in the universe are inspiralling and merging binary black holes; with LISA data, they will become the most distant, most completely and precisely modeled, and most accurately measured systems in astronomy outside the solar system, and will have important applications to cosmology. Other sources range from already known and named nearby Galactic binary stars, to compact objects being swallowed by massive black holes, to possible effects of new physics. Possible signals will be described from phase transitions and superstrings from the early universe. The talk will also briefly explore a new proposal that interferometers may be able to directly detect holographic noise from quantum fluctuations of local spacetime.

Wednesday, 5th December 07, 11:15 h, Room 348 / 349, Theresienstr. 37 / III