

# Observation of the merger of binary black holes: The opening of gravitational wave astronomy

**Rainer Weiss**

MIT

**July 19, 2017**

4:00 p.m. - Wilson Hall, One West

The recent observation of gravitational waves from the merger of binary black holes opens a new way to learn about the universe as well as to test General Relativity in the limit of strong gravitational interactions – the dynamics of massive bodies traveling at relativistic speeds in a highly curved space-time. The lecture will describe some of the difficult history of gravitational waves proposed 100 years ago. The concepts used in the instruments and the methods for data analysis that enable the measurement of gravitational wave strains of  $10^{-21}$  and smaller will be presented. The results derived from the measured waveforms, their relation to the Einstein field equations and the astrophysical implications are discussed. The talk will end with our vision for the future of gravitational wave astronomy.