

Cosmology with gravitational waves

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Gravitational waves can constitute a unique probe of the universe. After a general introduction to the subject, this seminar presents two aspects of using GW to probe cosmology. First, for sources operating in the early universe, the characteristic frequency of the emitted GW is directly related to the energy scale at which the GW source acts. Consequently, different GW detectors can probe different energy scales in the evolution of the universe, going much beyond the recombination scale accessible through the CMB. I will discuss the special case of the space-based interferometer eLISA, which operates in the right frequency range to probe the electroweak scale. Second, compact binaries emitting GW can be used as standard sirens, to probe the energy content of the late universe and test dark energy. I will discuss the potential of eLISA in constraining cosmological parameters.