



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 16 October 2014

17:00 -18:00

3rd Floor Seminar Room

“As Time Goes By, Backwards”

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Abstract

Hidden messages recorded backwards on a phonograph record could be deciphered by playing the record on a reversed turntable. However, the science and technology of playing sounds, or electromagnetic waves, backwards in time turns out to be far more interesting than any of those old backmasked messages on Beatles albums. Exploiting time-reversal invariance of the lossless wave equation leads to some surprising effects and is enabling remarkable new technologies. The forward/backward symmetry of wave propagation is exploited in a device known as a “time-reversal mirror.” Such devices actually operate best under conditions where the waves are strongly and randomly scattered, making time-reversed wave propagation of great practical utility. Furthermore, the time-reversed waves can be made to collapse in a very brief time interval and in a very localized manner in space. I will give an overview of the science and technology of this remarkable symmetry of nature, including development of a new sensor paradigm for detecting changes in complex environments, directed wireless communication, and wireless power transfer.