

# Séminaires de Physique de l'ESPCI

Jeudi 26 Novembre

16h00

Amphi Langevin

Esc. N 2ème étage

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### « Anderson Localization of Ultrasonic Waves in Three-Dimensions »

Some fifty years after Anderson localization was first proposed, there is currently a resurgence of interest in this phenomenon, which has remained one of the most challenging and fascinating aspects of wave transport in random media [1]. This interest is fuelled by theoretical and experimental advances, especially for classical waves, where unambiguous experimental evidence for localization in three dimensions has remained elusive until recently. In this talk, I will summarize our progress [2] in demonstrating the localization of ultrasound in a “mesoglass” made by assembling aluminum beads into a three-dimensional elastic network. We show how interference leads to trapping of waves in the presence of very strong disorder by studying three different fundamental aspects of Anderson localization: time-dependent transmission, transverse confinement of the waves, and unusual statistics (including the multifractal character of the wave functions). This is the first time that all three aspects have been studied simultaneously, providing very convincing evidence for the localization of ultrasonic waves in a three-dimensional disordered system.

[1] See Physics Today, August 2009.

[2] Hefei Hu, A. Strybulevych, J.H. Page, S.E. Skipetrov and B.A. van Tiggelen, Nature Physics, 4, 945

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