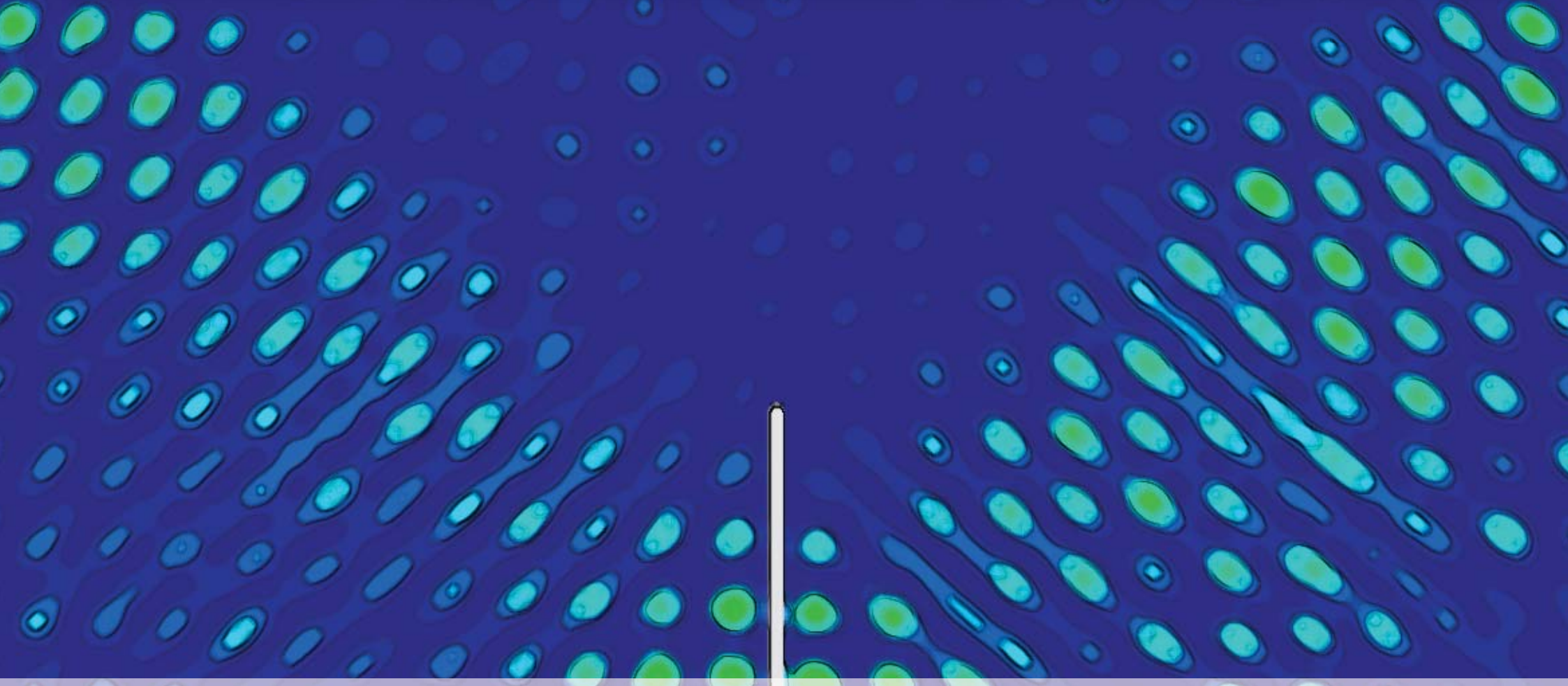
UNIVERSITÀ DEGLI STUDI DI MILANO

SCUOLA DI DOTTORATO IN FISICA
ASTROFISICA E FISICA APPLICATA

Physics Colloquia 2010/2011

Playing billiards with microwaves: Quantum manifestations of classical chaos



Sufficiently flat microwave resonators shaped in the form of billiards are particularly well suited to study the quantum mechanical behavior of classically chaotic systems because of the formal equivalence of the respective wave equations, i.e. the Helmholtz and the Schroedinger equation. With superconducting resonators characterized by high quality factors it has become possible for the first time to measure the spectrum of eigenmodes and their eigenfunctions completely and to determine their statistical properties.
Two-dimensional billiard systems (stadium, mushroom, …) of different chaoticity are discussed and it is shown that they display universal features which are also evident in real mesoscopic systems of different scales, i.e. hadrons, nuclei, atoms, molecules, clusters.
Special emphasis is placed on properties of measured spectra and wavefunctions, and on so called Friedel oscillations, known also from surface and condensed matter physics.
Finally, chaotic scattering in microwave billiards is considered for time reversal invariant and non-invariant systems, respectively.

MAY

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Gli incontri si terranno alle **ore 15:00**
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