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המכון למצב מוצק

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סמינר

## Probing borders between geometry and physics with micro-billiard lasers

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The billiard paradigm is being widely studied in nonlinear dynamics and mathematical physics, as an avenue onto deep issues pertaining to quantum and wave physics, all the way to quantum chaos. It can be implemented in mechanics, optics or electromagnetism, depending on experimental configurations and on the billiard length-scale. The elusive borders between wave and geometric optics on the one hand, and between quantum and classical mechanics on the other, exhibit deep analogies, which can be both experimentally probed in billiard-like physical systems. We will show the relevance in this context of micro-billiard shaped lasers, thanks to new experimental and technological advances in the realm of polymer based photonics at micron and nanometer scales. Closed orbits to be viewed as folded spatial geodesics within a confining contour, are playing a central role, to be connected to a distributed electromagnetic approach via semi-classical physics methods. Particular attention will be paid to systematic theoretical and experimental investigations of triangular cavities in relation with their symmetry types, full elucidation of the remarkable emission properties of square cavities at the proximity of threshold and preliminary extensions to 3-D micro-billiards.

*This work is being performed at LPQM/ENS Cachan/UPS, together with Clément Lafargue (Ph.D. student), Stefan Bittner (postdoctoral fellow) and Mélanie Lebental (assistant professor), in collaboration with Eugene Bogomolny from LPTMS (University Paris-Saclay and CNRS).*

ההרצאה תתקיים ביום רביעי, ה-6.4.16 בשעה 12:30

בבניין המכון למצב מוצק, בחדר הסמינרים

The lecture will take place on Wednesday, 6.4.16 at 12:30

at the Solid State Institute, seminar room

Host: Distinguished Professor Moti Segev