Physics
AT QUEENS COLLEGE

Colloquium Notice

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Light in asymmetric dielectric resonators: chaos, tunneling and localization

Dielectric cavities can support long-lived resonant states of the electromagnetic field. These resonances correspond to ray trajectories, which are trapped inside the cavity by internal reflection, as e.g. in "whispering gallery" resonances of microspheres and microcylinders. When such cavities are deformed from their symmetric shapes, the dynamics of the corresponding ray trajectories undergoes a transition from integrability to chaos. This transition has a dramatic effect on the properties of the high-Q resonances.

Microcylinder lasers based on such asymmetric resonators, show strongly directional light emission and high power output (with several orders of magnitude enhancement compared to standard microdisc lasers). Measurements of the optical spectra in these novel semiconductor devices show direct signatures of the classical Kolmogorov-Arnold-Moser transition from integrability to chaos, chaos-assisted tunneling, dynamical Anderson localization and a laser action on "scar"-modes.

Monday
November 10, 2003
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326