TECHNISCHE UNIVERSITÄT
CHEMNITZ

Institut für Physik
Physikalisches Kolloquium

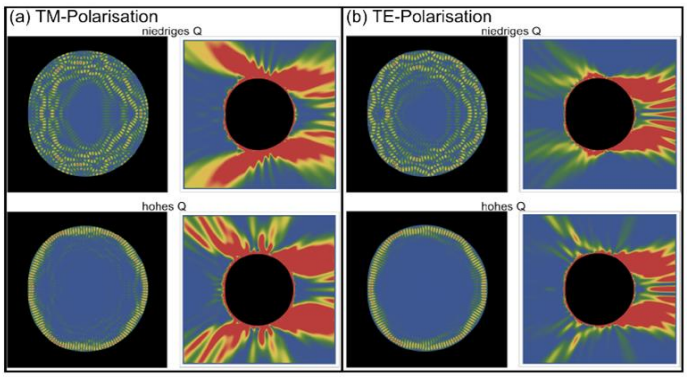
Mittwoch, 08.06.2016, um **16:00 Uhr**

Ort: Reichenhainer Str. 90;
Zentrales Hörsaal- und Seminargebäude,
Raum 2/N013

Prof. Dr. Martina Hentschel
Technische Universität Ilmenau
Institut für Physik

Billiards for light

The miniaturisation of technical devices can reach operation borders where new concepts are needed. One example are optical microdisk lasers that provide a promising alternative to the well-known Fabry-Perot lasers as well as to VCSELs when the size of optical devices is reduced to the scale of few micrometers. Whereas high Q-modes are available through whispering-gallery-type resonances that are trapped by total internal reflection inside the resonator, it remains a challenge to achieve directional emission by suitably breaking the rotational symmetry of such microdisk devices. It turns out that already slight deviations from the disk, e.g., the so-called Limaçon-shape, are sufficient to achieve a robust far-field directionality while keeping the desired high Q-factors. To this end, the microdisk is considered as billiards for light. We argue that the far-field emission characteristics is determined by the unstable manifold of the billiards, a quantity well-known in the fields of dynamical systems and quantum chaos. It implies that ray-based calculations, wave-simulations and experiments yield practically the same far-field results. In particular, the easy-to-implement ray-optics methods are an appropriate tool to predict the far-field patterns of microdisk lasers.



Resonance modes of a Limaçon microdisk. Left (right) panels: internal (external) mode structure.

Alle Zuhörer sind ab 15:45 zu Kaffee und Tee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:
Prof. Dr. Michael Schreiber, Tel. 0371 531-21910

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