Max Born Institute

Institutskolloquium

am Mittwoch, den 14.11.2007, 16.00 Uhr

Max-Born-Saal

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„Advances in Optical Parametric Oscillators”

Abstract

Since its invention more than forty years ago, the Laser has become an indispensable optical tool capable of transforming light from its naturally incoherent state to a highly coherent state in space and time. The impact of this “optical coherence transformer” on the field of Optics can be likened to that of the transistor on the field of Electronics. At the same time, due to fundamental limitations, operation of the laser remains confined to restricted spectral and temporal regions, rendering it an inflexible light source for many applications. Nonlinear optics can overcome the limitations of conventional lasers by allowing access to new spectral and temporal regimes through the exploitation of suitable dielectric materials in combination with the laser. In particular, optical parametric generation, amplification, and oscillation represent versatile techniques for the generation of coherent radiation with unique spectral and temporal flexibility across extended spectral regions from the ultraviolet to the mid-infrared and in all time-scales from the steady-state continuous-wave (cw) to the ultrafast femtosecond domain.
The advent of novel birefringent and quasi-phase-matched nonlinear materials, new crystalline, semiconductor, and fiber laser sources, and innovative device design concepts, during the last decade, have led to the realization of a new generation of optical parametric sources with unprecedented performance capabilities and their utility has been demonstrated in many new applications. This talk will provide an overview of the recent advances in optical parametric devices, with particular emphasis on *optical parametric oscillators* (OPOs) from the cw to femtosecond time-scales. The talk will include a description of nonlinear materials, device architectures, and applications of OPO devices in spectroscopy, environmental sensing, life sciences, and biomedicine.

Interessenten sind herzlich eingeladen
Prof. I. V. Hertel