

**EINLADUNG ZUM
INSTITUTSKOLLOQUIUM**

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**"On Recent Progress in diagnostics of
molecular plasmas and in Trace Gas Detection
using Infrared techniques"**

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Wilhelm-Ostwald-Straße 3 (IBZ)
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Gäste sind herzlich willkommen !

ABSTRACT

ON RECENT PROGRESS IN DIAGNOSTICS OF MOLECULAR PLASMAS AND IN TRACE GAS DETECTION USING INFRARED TECHNIQUES

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Within the last decade mid infrared absorption spectroscopy over the region from 3 to 17 μ m and based on tuneable lead salt diode lasers, often called Tuneable Diode Laser Absorption Spectroscopy or TDLAS, has progressed considerably as a powerful diagnostic technique for *in situ* studies of the fundamental physics and chemistry in molecular plasmas and for trace gas detection. The increasing interest in processing plasmas containing hydrocarbons, fluorocarbons, organo-silicon and boron compounds and in trace gas problems has lead to further applications of TDLAS because most of these compounds and their decomposition products are infrared active. Since plasmas with molecular feed gases are used in many applications such as thin film deposition, semiconductor processing, surface activation and cleaning, and materials and waste treatment, this has stimulated the adaptation of infrared spectroscopic techniques to industrial requirements. The recent development of Quantum Cascade Lasers (QCL) offers an attractive new option for fundamental studies and for the monitoring and control of industrial plasma processes. The aim of the present paper is threefold: (i) to review recent achievements in our understanding of molecular phenomena in plasmas and gases, (ii) to report on selected studies of the spectroscopic properties and kinetic behaviour of radicals, and (iii) to describe the current status of advanced instrumentation for TDLAS and QCLAS in the mid infrared.