

# Physikalisches Kolloquium

Thursday, 26.06.14, 17:15, HS 100  
 Reception with coffee & cookies 16:45

Prof. em. Dr. Dieter Gerlich

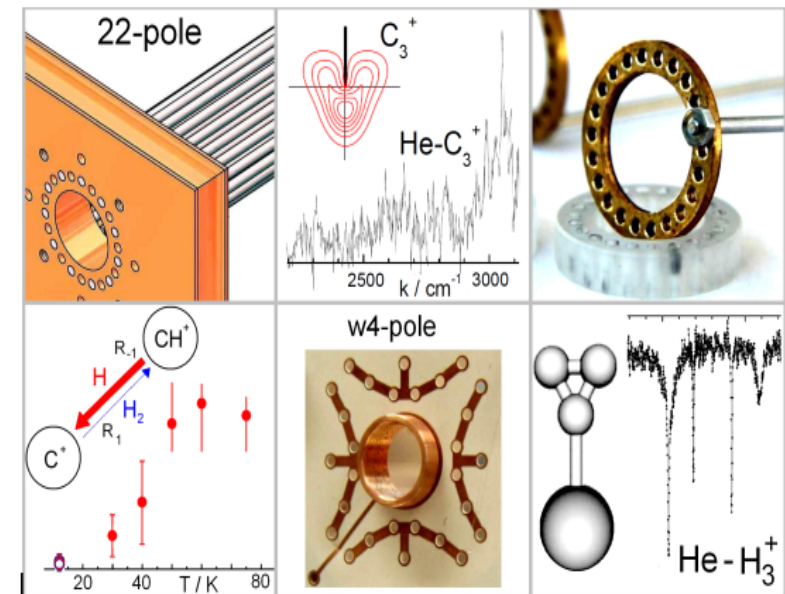
Technische Universität Chemnitz

*Recent applications of low temperature ion traps in spectroscopy, mass spectrometry, and cold chemistry*

## Abstract

Ion guiding and trapping in inhomogeneous rf fields [1] is used in many instruments for studying the structure of molecular ions, their collision processes (bimolecular reactions, radiative association, growth of clusters), and the physics and chemistry of charged nanoparticles. In the introduction of my talk, I give a personal "short" (45 years) review of this versatile technique and mention recently developed new electrode arrangements. In the results section, I present data obtained in the last two years in cooperation with groups in Prague, Köln, and Basel. Using beams of radicals, pushing the temperature down to 2.6 K, and increasing the He buffer gas densities up to  $10^{16} \text{ cm}^{-3}$  has opened up new possibilities. Recent results include formation and destruction of  $\text{CH}^+$  under interstellar conditions, applications of an innovative method for ion spectroscopy (LIICG), the synthesis and study of  $\text{He-H}_3^+$  complexes, and the first experimental detection of the structure of doubly charged benzene. Tentative steps to unravel spectroscopic feature of the simple but unknown ion  $\text{C}_3^+$  will be mentioned.

[1] D. Gerlich, *Inhomogeneous Electrical Radio Frequency Fields: A Versatile Tool for the Study of Processes with Slow Ions*. *Adv. in Chem. Phys.* **LXXXII** (1992) 1. For more references see <http://www.tu-chemnitz.de/physik/ION/Publications>



All of you interested in physics are cordially invited!