SFB/TRR 21 - Kolloquium
04. Mai 2007, Ulm

Dr. Christian Roos
(Experimentalphysik Universität Innsbruck)

Precision spectroscopy and quantum information processing with trapped ions

At a first glance, high-resolution laser spectroscopy and quantum computers don't seem to have much in common. However, a closer look reveals many similarities. For both applications, ions held in electromagnetic traps are employed, the ions' quantum state being manipulated by lasers. In both cases, quantum superposition states play a key role, and information about the experiment is inferred from a quantum state measurement at the end of the experiment that project the ions' superposition state onto one of the basis states. Therefore, it is natural to investigate whether techniques that will become important for contructing future quantum computers might also have applications in precision spectroscopy.
In my talk, I will discuss our latest experiments aiming at making quantum information processing more robust against environmental noise and I will show how to apply (quantum mechanically) correlated states of two ions for precision measurements of atomic constants.

04. Mai 2007, 15:30 Uhr

Universität Ulm, Raum N24 H12
Albert-Einstein-Allee 11, 89081 Ulm

CO.CO.MAT