universität innsbruck
Forschungsschwerpunkt Physik

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Physics Colloquium

Precision at the Extremes: Exploring the Standard Model with Trapped Exotic Ions


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Colloquium talk
by

Klaus Blaum

Max-Planck-Institut für Kernphysik Heidelberg

The four fundamental interactions and their symmetries, along with the fundamental constants and properties of elementary particles – such as masses and magnetic moments – form the foundational structure of the universe and underpin the well-tested Standard Model (SM) of particle physics. Conducting stringent tests of these interactions and symmetries under extreme conditions, at low energies and with the highest precision, for example by comparing particles and their counterparts, the antiparticles, allows us to probe for potential physics beyond the SM. Advancing these tests beyond their current limits requires the development of innovative experimental techniques.

This overview highlights recent technical advancements and measurements of atomic and nuclear masses, as well as *g*-factors, with unprecedented precision, performed on individual or a few cooled exotic ions stored in Penning traps. Notably, these experiments have among others enabled the most precise tests of bound-state quantum electrodynamics and have significantly improved the accuracy of several key fundamental constants.

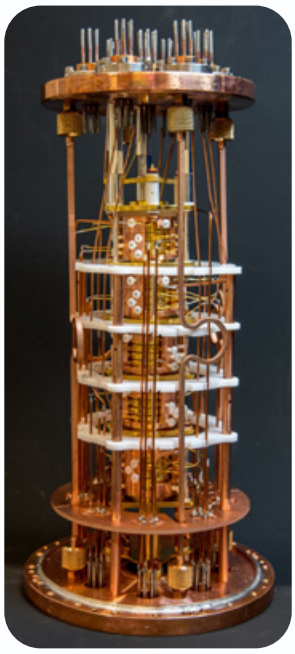
Photo by Ralf Lackner, MPIK

Tuesday, 19 May, 16:30

HS C, Victor-Franz-Hess-Haus

Organizers: Katrin Erath-Dulitz, Francine Marleau, Hanns-Christoph Nägerl