

Low-energy atomic physics experiments at HITRAP and Cave A

GSI, 20-21 November 2006
(Theory seminar room SB3 3.170a)

Monday 20.11.2006

9:00 *Bus transfer from IBIS hotel to GSI*

Session 1: Facilities (chair: H.-J. Kluge)

10:00 – 10:05 **H.-J. Kluge:** Welcome

10:05 – 10:20 **M. Steck,** GSI: ESR opportunities and new developments

10:20 – 10:35 **A. Braeuning-Demian,** GSI: Experimental opportunities with medium- and low-energy HCI at Cave A

10:35 – 10:50 **O. Kester,** GSI: HITRAP facility - status report

10:50 – 11:05 **F. Herfurth,** GSI: HITRAP cooler trap - status report

11:05 – 11:35 *Coffee break*

11:35 – 11:50 **G. Zwicknagel,** Erlangen: Theoretical description of electron cooling of HCI in the HITRAP cooler trap

11:50 – 12:05 **W. Quint,** GSI: HITRAP experiments H1-H6: overview

Session 2: g-Factor measurements, mass measurements (chair: F. Aumayr)

12:05 – 12:20 **B. Schabinger,** Mainz: Towards a g-factor determination of the electron bound in heavy highly charged calcium ions

12:20 – 12:35 **S. Nagy,** Mainz: A novel four-trap mass spectrometer for high-accuracy mass measurements on highly-charged ions

12:35 – 12:50 **Y. Novikov,** St. Petersburg: Programme for the neutrino mass determination by Penning trap mass measurements

12:50 – 14:00 *Lunch*

Session 3: Laser spectroscopy on HCI (chair: A. Wolf)

14:00 – 14:15 **R. Thompson,** London: Hyperfine splitting in highly charged ions

14:15 – 14:30 **D. Winters,** GSI: Ion trap system RETRAP

14:30 – 14:45 **M. Vogel,** GSI: Development of a Penning trap for laser spectroscopy on HCIs

14:45 – 15:00 **G. Birkl,** Darmstadt: Cold atoms and laser development for spectroscopy on trapped HCIs

15:00 – 15:15 **T. Köhl,** GSI: X-ray laser spectroscopy of lithium-like ions in the HITRAP beam-line

Session 4: CaveA experiments (chair: A. Wolf)

15:15 – 15:30 **V. Balashov,** Moscow State University: Theoretical arguments for polarization and correlation X-ray measurements with channeled highly-charged ions

15:30 – 15:45 **A. Braeuning-Demian,** GSI: Interaction of highly charged ions with crystals under channeling conditions at intermediate energies

15:45 – 16:00 **R. Schuch,** Stockholm: Transmission of slow highly-charged ions through nano-structures

16:00- 16:30 *Coffee break*

Session 5: Collisions and X-ray spectroscopy with HCI (chair: R. Schuch, to be confirmed)

16:30 – 16:45 **A. Wolf,** MPI-K: Opportunities and procedures for electron-ion recombination measurements with HITRAP

16:45 – 17:00 **R. Moshhammer,** MPI-K: Collision experiment with a reaction microscope at HITRAP

17:00 – 17:15 **M. Trassinelli,** GSI: X-ray spectroscopy at HITRAP

17:15 – 17:30 **P. Indelicato,** Paris: X-ray spectroscopy on slow highly charged ions

17:30 – 17:45 **P. Beiersdorfer,** LLNL: Studies with trapped highly charged ions at Livermore and possible new directions

18:00- 18:45 **Tour to facilities**

18:00- 19:00: *open satellite meeting: topical discussion on 'Neutrino mass programme', in AP-seminar room*

18:15-18:30 *F. Gatti: Toward a high-sensitive measurement of neutrino mass with calorimetric detectors*

19:30 *Workshop dinner*

21:30 *Bus transfer to hotel*

Tuesday 21.11.2006

8:15 *Bus transfer from IBIS hotel to GSI*

Session 5 (cont.): Collisions and X-ray spectroscopy with HCI (chair: D. Vernhet, to be confirmed)

- 9:00 – 9:15 **S. Fritzsche**, Kassel: Accurate calculations of atomic structure and capture processes of high-Z ions
- 9:15 – 9:30 **A. Surzhykov**, MPI-K: Angular distribution of x-ray photons from excited ionic states with unresolved fine structure
- 9:30 – 9:45 **M. Weidemüller**, Freiburg: Ultracold atoms as targets for highly-charged ion and antiproton beams
- 9:45 – 10:00 **T. Schlathöler**, KVI Groningen: Interaction of slow HCIs with (bio-)molecules

Session 6: HCI-surface interaction (chair: D. Vernhet, to be confirmed)

- 10:00 – 10:15 **R. Hoekstra**, KVI, Groningen: Interaction of HCI with (magnetized) surfaces
- 10:15 – 10:30 **F. Aumayr**, Vienna: Nano-hillock formation on CaF₂ by slow highly charged ions

10:30 – 11:00 *Coffee break*

11:00 – 12:30 Discussions in subgroups H1-H6/CaveA

12:30 – 13:30 *Lunch*

Session 7: Convener reports of subgroups

- 13:30 – 13:40 H1: reaction microscope, collisions at very low velocities, convener: *R. Moshhammer*
- 13:40 – 13:50 H2: HCI-surface interaction and hollow-atom spectroscopy, convener: *R. Hoekstra*
- 13:50 – 14:00 H3: x-ray spectroscopy, convener: *T. Stoehlker*
- 14:00 – 14:10 H4+H5: g-factor and mass measurements, convener: *W. Quint*
- 14:10 – 14:20 H6: laser spectroscopy on highly charged ions, convener: *D. Winters*
- 14:20 – 14:30 CaveA: Atomic physics experiments at the low-energy experimental area, convener: *A. Braeuning-Demian*

Final discussion and closing remarks

14:30 – 15:45

(16:15, GSI-Colloquium, N. Severijns: Weak interactions studies in nuclear beta-decay)