

FAKULTÄT für PHYSIK  
LUDWIG-MAXIMILIANS-UNIVERSITÄT  
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
MÜNCHEN/GARCHING

## MLL-KOLLOQUIUM

Donnerstag, 14.12.2017, 16<sup>15</sup> Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1  
Treffen zum gemeinsamen Kaffee 16 Uhr

**Prof. Christoph E. Düllmann**

(Univ. Mainz, Helmholtz-Institute Mainz, GSI Darmstadt, PRISMA Cluster of  
Excellence /Mainz )

### On Superheavy Elements and Ultra-Light Neutrinos

Recent atomic physics and chemistry studies with the heaviest elements and a brief report on the current status of the ECHo project on the electron neutrino mass determination.

Four new superheavy elements with atomic numbers 113, 115, 117, and 118 have been added to the periodic table last year, completing the seventh period. Besides the search for yet heavier elements, which has already started, the current focus at GSI Darmstadt is on in-depth studies of nuclear, atomic and chemical properties of the known superheavy elements. I will first give a general introduction to current superheavy element research, and then highlight recent experiments on the chemical properties of the heaviest elements beyond copernicium (element 112), on measurements of the first ionization potential of the heaviest actinides, which triggered a discussion on the structure of the periodic table, and briefly on complementary laser-spectroscopic studies in nobelium. In a second part, I will switch to ultra-light systems and discuss experiments on the determination of the electron neutrino mass in the sub-eV/c<sup>2</sup> range as pursued by the ECHo-project. This employs a calorimetric measurement of the neutron capture spectrum of the artificial radioisotope holmium-163, which features the smallest Q-value for this decay mode. While this renders Ho-163 most attractive for such studies, the production of sufficient quantities with suitable purity is challenging.

gez. Peter Thirof  
Tel. 289-14064

gez. Norbert Kaiser  
Tel. 289-12367