



# Innsbruck Physics Colloquium

## Small is beautiful: structure and dynamics of atomic and molecular clusters

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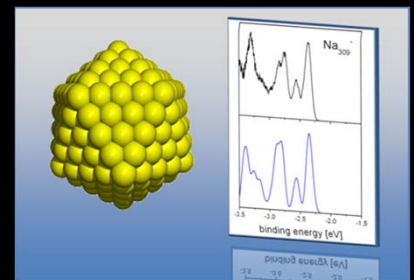
Clusters and nanoparticles often have properties rather different to those of the corresponding bulk material, which is due to their large surface-to-volume ratio and in general to quantum size effects, the discretization of otherwise continuous densities of states. Especially the latter effect makes them highly interesting candidates for the study of few to many particle physics. In this talk the intricate interplay between electronic and geometric structure in simple metal clusters will be discussed, which has been clarified by a combination of photoelectron spectroscopy on free, size-selected alkali and noble metal clusters and DFT-calculations. Recently the use of angle-resolved photoelectron spectroscopy here even allowed obtaining direct information on the nature of the electronic wavefunctions in these particles. New results demonstrate that the ultrafast multi-electron dynamics during the photoionization process lead to a surprisingly simple and universal form of the angular distributions.

Another example of a cluster specific phenomenon is the non-metal to metal transition in divalent material clusters; here especially zinc clusters in the transition region exhibit unexpected electronic and geometric structures, which can be described as partly metallic and partly insulating. I will finish with an outlook on future experiments, which will make use of the enormous potential of modern light sources like synchrotrons and FELs.

**DK-ALM Pre-Talk: 16:30 h**

**Sohmen Maximilian**

**Dipolar Quantum Gases of Erbium and Dysprosium**



Snacks will be provided in between the pre-talk and the colloquium.

**Colloquium: Tuesday, 04.06.2019**

**17:15 h in lecture hall C**

Innsbruck Physics Colloquium, Organisation: M. Beyer, H.-C. Nägerl, A. Reimer