

Einladung zu einem Kolloquium

Datum/Zeit: **Dienstag, 12.11.2024, 16.45 Uhr**

Referent: **Dr. David Busto**
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Titel: *Photoelectron quantum state spectroscopy*

Ort: **HCI J3**

Photoelectron spectroscopy, pioneered by Kai Siegbahn, is a powerful tool to study the structure of matter. This method relies on measuring the classical momentum of the photoelectrons emitted from a target following the absorption of a high energy photon. When ultrashort extreme ultraviolet pulses are used to ionize the target, the photoelectrons are characterized by a broad distribution of continuum states, forming, in the time domain, short electron wave packets. A key question is whether this distribution is fully coherent, or if instead it is only partially coherent, consisting of a statistical mixture of states. Addressing this question requires a tomographic measurement of the photoelectron density matrix.

In this seminar I will present a new photoelectron quantum state tomography scheme, KRAKEN, that we recently implemented experimentally. I will discuss the results obtained in helium and argon atoms, showing that the photoelectrons emitted from helium are pure, while in argon, owing to ion-photoelectron entanglement, the photoelectrons are a statistical mixture. These results show that the quantum state of photoelectrons depends on the properties of the parent atom, opening new avenues for spectroscopy.

Gäste sind willkommen