

O 60: Overview Talk: Leo Gross

Time: Wednesday 9:30–10:15

Location: TRE Phy

Topical Talk

O 60.1 Wed 9:30 TRE Phy

On-surface reactions and charge transitions by atomic manipulation — ●LEO GROSS — IBM Research - Zurich, Säumerstr. 4, 8003 Rüschlikon, Switzerland

Molecules can be created using atomic manipulation to break and to form covalent bonds. High-resolution atomic force microscopy (AFM) with functionalized tips provides insights into the structure, geometry, aromaticity, charge states and bond-order relations of the molecules created and into the reactions performed [1]. Recently, we generated the molecular carbon allotrope cyclo[18]carbon and resolved its long

debated structure [2].

On insulating substrates, we can control the charge state of molecules by deliberately attaching and detaching single electrons with the tip. We measured the reorganization energy of a molecule on an insulator [3] and resolved the changes within molecular geometry, adsorption and aromaticity related to its oxidation state [4].

References

- [1] L. Gross et al. *Angew. Chem Int. Ed* 57, 3888 (2018)
- [2] K. Kaiser et al. *Science* 365, 1299 (2019)
- [3] S. Fatayer et al. *Nat. Nano.* 13, 376 (2018)
- [4] S. Fatayer et al. *Science* 365, 142 (2019)