Max-Planck-Institut für Struktur und Dynamik der Materie

Max Planck Institute for the Structure and Dynamics of Matter

Wednesday, January 29th, 2020 – 14:00 p.m.
CFEL Seminar room V (Bldg. 99)

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Near-Field Physics and Chemistry in Plasmonic STM junctions

Plasmonic cavities exhibit many intriguing properties and phenomena resulting from strong field enhancement and confinement. Recently, both experimental and theoretical studies have revealed crucial roles of atomistic structures and quantum mechanical effects in plasmonic nanostructures [1-3]. However, the nature of an electromagnetic field confined to atomic-scale structures and the interaction between such an extreme field and matter remains poorly understood. Plasmonic STM junctions provide a unique opportunity to examine near-field-driven physics and chemistry on the atomic scale. I will discuss our recent studies on near-field physics and chemistry in plasmonic STM junctions, including near-field-induced chemical reactions [4,5], plasmon assisted resonant electron transfer [6], engineering of localized surface plasmon resonance in STM junctions [7], and tip-enhanced resonance Raman spectroscopy [8].

References

[1] Benz *et al. Science* **354**, 726 (2016).
[2] Zhang *et al. Phys. Rev.* B **90**, 161407(R) (2014).
[3] Urbieta *et al. ACS Nano* **12**, 585 (2018).
[4] H. Böckmann *et al. Nano Lett.* **18**, 152 (2018).
[5] H. Böckmann *et al. J. Phys. Chem. Lett.* **10**, 2068 (2019).
[6] S. Liu *et al. Phys. Rev. Lett.* **121**, 226802 (2018).
[7] H. Böckmann *et al. Nano Lett.* **19**, 3597 (2019).
[8] S. Liu *et al. Nano Lett.* **19**, 5725 (2019).

Host: Heiko Appel, Angel Rubio

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