

O 23: Invited Talk (Jörg Schäfer)

Time: Tuesday 14:00–14:45

Location: HSZ 02

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Surfaces and Atomic Nanostructures - Model Systems for Spectroscopy of Confined Interacting Electrons — ●JÖRG SCHÄFER — Physikal. Institut, Universität Würzburg, Germany

Low-dimensional systems defined on surfaces and by self-organized nanostructures provide a new gateway to study electronic interactions. This intimately pertains to quasiparticles intertwined with elementary excitations, the role of confined electron systems and touches the regime of non-Fermi liquid physics. Quasiparticle dynamics can be detected directly in photoemission spectra. In the last years, this method has been extended beyond phonons to include coupling to spin excitations. Regarding dimensional confinement, one-dimensional (1D) systems may be susceptible to charge density waves with energy gaps.

Yet less known effects such as fluctuations and unusual many-body states can also be unveiled.

Very recently, self-organized atomic nanowires have been identified where the 1D confinement reaches its ultimate limit [1, 2]. We will review the unique properties of such chains grown on semiconductor templates. In novel Au-induced chains, tunneling data reveal that metallic charge is delocalized in 1D direction. Yet laterally it is confined to atomic dimensions, thereby establishing a 1D electron liquid as not reported before [2]. The talk presents an overview of the state-of-the-art of spectroscopy on surface electron systems, including a perspective for exotic physics.

[1] A. A. Stekolnikov *et al.*, PRL **100**, 196101 (2008).

[2] J. Schäfer *et al.*, PRL **101**, in press (2008), Editors' Suggestion.