

O 28: Invited Talk Bruno (FV: MA+O)

Time: Tuesday 14:00–14:30

Location: H10

Invited Talk

O 28.1 Tue 14:00 H10

Controlling magnetism and self-organization of adatoms on surfaces by using quantum interferences — ●PATRICK BRUNO, VALERI STEPANYUK, NIKOLAY NEGULYAEV, and LARISSA NIEBERGALL — Max Planck Institute of Microstructure Physics, Halle, Germany

Due to the presence of a surface state, a quasi-free two-dimensional electron gas (2DEG) floats on the (111) surface of noble metals. This 2DEG mediates long-range oscillatory interactions among adatoms, and therefore controls to a large extent the formation of magnetic nanostructures on such surfaces. The competition between this long-range inter-adatom interaction and the adatom-surface interaction

gives rise to a wide variety of structures, depending on the nature of adatoms, on their density, on temperature, on the presence of atomic steps, etc. These processes have been studied theoretically by using a combination of first-principles and kinetic Monte-Carlo methods. We have also investigated the spin-polarization and the exchange interaction among adatoms mediated by the 2DEG, as well as how they can be influenced by using quantum confinement and quantum interferences.

V. S. Stepanyuk et al., Phys. Rev. Lett. 94, 187201 (2005)

N.N. Negulyaev et al., Phys. Rev. B 74, 035421 (2006)

L. Niebergall et al., Phys. Rev. Lett. 96, 127204 (2006)

V.S. Stepanyuk et al., Phys. Rev. Lett. 97, 186403 (2006)

P. Wahl et al., Phys. Rev. Lett (in press, 2007)