Contribution ID: **259** Type: **Poster**

# Ultra small iron nanoparticle superlattice on graphene on iridium

*Monday, 17 September 2018 17:45 (15 minutes)*

The physical properties of ultra small clusters, such as magnetism, can differ fundamentally from the bulk material and are dominated by their confinement and atomic structure [1, 2]. The arrangement of such nanoparticles in a superlattice not only allows to reach high density and small size distribution, but it also enables new characterization approaches [2]. This is of great interest for magnetic storage applications, as well as fundamental science.
Iridium seeding on graphene on Ir(111) allows to grow large area ultra small ~1nm iron nanoparticle superlattices [1]. We studied the system with various measurement techniques in-situ on different setups in order to gain and correlate structural, electronic and magnetic information. Structural characterization of the lattice from scanning probe techniques can therefore be combined with atomically resolved surface x-ray diffraction [2]. We have observed a size dependent structural phase transition which we will link to magnetic information from x-ray magnetic circular dichroism. An outlook on tailored substrates [3] and the possibility of coverlayers will be given.

References:
[1] Alpha T. N'Diaye, et al, New Journal of Physics 11, 103045 (2009).
[2] Dirk Franz, et al, Phys. Rev. Lett. 110, 065503 (2013).
[3] Arti Dangwal Pandey, et al, J. Appl. Phys. 120, 075304 (2016).

**Primary author:** KRAUSERT, Konstantin (DESY / Universität Hamburg)

**Co-authors:** GRÅNÄS, Elin (DESY NanoLab); CREUTZBURG, Marcus (DESY / Universität Hamburg); ARNDT, Björn (DESY / Universität Hamburg); Dr DANGWAL PANDEY, Arti (DESY); TOBER, Steffen (DESY / Universität Hamburg); LAKNER, Pirmin (DESY / Universität Hamburg); Dr NOEI, Heshmat (DESY NanoLab); Dr SHAYDUK, Roman (DESY / XFEL); KIELGAST, Fridtjof (Universität Hamburg); Dr BAEV, Ivan (Universität Hamburg); Dr FRANZ, Dirk (DESY / Universität Hamburg); Dr VONK, Vedran (DESY Nanolab); Dr MARTINS, Michael (Universität Hamburg); STIERLE, Andreas (DESY / Universität Hamburg)

**Presenter:** KRAUSERT, Konstantin (DESY / Universität Hamburg)

**Session Classification:** Poster session 1

**Track Classification:** P4 Magnetism and quantum phenomena