

## O 37: Invited Talk (Hubertus Marbach)

Time: Wednesday 10:15–11:00

Location: TRE Phy

**Invited Talk**

O 37.1 Wed 10:15 TRE Phy

**Writing nanostructures with a focused electron beam** —  
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The injection of electrons can be used to trigger physical or chemical processes, like bond formation or dissociation. In our surface science approach to focused electron beam induced processing (FEBIP) we use a 3 nm diameter electron beam from a scanning electron microscope (SEM) in ultra high vacuum to locally dissociate adsorbed precursor molecules or locally change substrate properties. This approach is suitable to fabricate extremely small and pure nanostructures with lithographic control. One example are pure iron nanostructures pro-

duced by electron beam induced dissociation (EBID) of  $\text{Fe}(\text{CO})_5$  on  $\text{Si}(100)$  [1]. Systematic studies on various substrates revealed a strong influence of the nature and preparation state of the surface; among other effects electron scattering and catalytic properties must be considered. On  $\text{SiO}_x$ , we found that an electron beam can locally preactivate the sample; subsequent exposure to a precursor and autocatalytic growth allow to produce pure structures already at room temperature [2]. This represents a novel lithographic technique to generate pure nanostructures.

[1] Lukasczyk et al., *Small*, 4 (2008) 841.

[2] Walz et al., *Angew. Chem. Int. Ed.*, 49 (2010) 4669.

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