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**MA 1: Invited Talk Goll**

Time: Monday 9:30–10:00

Location: EB 301

**Invited Talk** MA 1.1 Mon 9:30 EB 301  
**Composite nanoparticles and nanopatterns for ultrahigh density magnetic recording** — •DAGMAR GOLL — Max-Planck-Institut für Metallforschung, Heisenbergstraße 3, 70569 Stuttgart

Perpendicular magnetic recording on the basis of exchange coupled composite (ECC) media is currently considered to be the most straightforward method to realize ultrahigh recording densities of 1 Tbit/in<sup>2</sup> and more. ECC media are nanopatterns of magnetically isolated grains each consisting of a hard magnetic and a soft magnetic layer which are coupled by exchange interaction. The composite system combines both high thermal stability of the stored information even for

reduced grain dimensions close to the superparamagnetic limit and moderate switching fields which can be afforded by conventional write heads. Composite L1<sub>0</sub>-FePt/Fe bilayers have been prepared by ion beam sputter deposition on MgO(001) substrates. By using electron beam lithography the bilayers have been nanopatterned into arrays of squared nanodots covering 3 mm x 3 mm. The magnetic properties of these nanostructures are discussed within the framework of analytical and numerical micromagnetism. The dependencies of switching fields, switching times and thermal stability of the composite nanoparticles on material parameters, shape and film thicknesses are systematically analyzed. The results allow explicit predictions for the development of optimum high-density recording devices based on ECC media.