Interaction effects in heterostructures of nanoscale magnetic particles and magnetic thin films JENS MUELLER, STEPHAN VON MOLNAR, Florida State University, Tallahassee, FL, YUZO OHNO, HIDEO OHNO, Tohoku University, Sendai, Japan — Elongated magnetic nanoparticles attract continuing attention both because of potential technological applications such as high-density information storage. Particles of 5 - 15 nm in diameter may be grown by STM assisted CVD, an advantageous technique for exact positioning of individual Fe particles on different substrate materials. A first step towards an ultimate application of these small and local magnetic flux sources to intentionally influence and investigate other materials is to study heterostructures of magnetic particles and an underlying magnetic film. Growing arrays or individual particles onto a magnetic thin film strongly enhances interactions between adjacent particles. Also, the particles alter the magnetic domain structure of the magnetic thin film making the transport properties of the latter sensitive to the magnetization state of the particles grown on top. We will present magnetization measurements of magnetic nanoparticles/thin-film heterostructures with permalloy and the concentrated magnetic semiconductor EuS as film material. These results will be compared with measurements of non-interacting particles grown onto a non-magnetic gold film. We also studied the effect of the particle’s magnetization state on the transport properties of a magnetic permalloy film. We find a distinct (negative) switching effect in the magnetoresistance that persists up to room temperature.