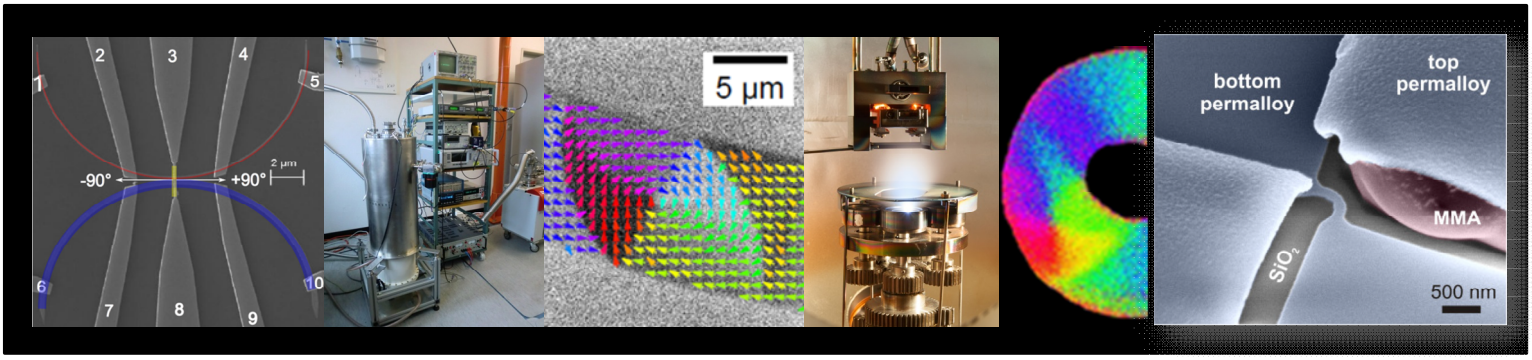

Experimental Ph.D position in ultra-efficient spin manipulation

A Ph.D. position is available in the field of spintronics studying pure spin currents and their employment in devices, such as non-local spin valves. A variety of different generation methods for these pure spin currents will be studied and compared, including newly emerging phenomena such as the spin Hall effect and ultimately optical generation of ultrafast superdiffusive spin currents, effects which are very timely and highly interesting from a scientific point of view. In particular we are working on novel effects due to the interaction of spin currents and magnetization, leading to highly efficient spin dynamics such as magnetization switching and domain wall propagation. This project has a strong outlook towards applications such as data storage and logic, since such devices have even received industrial interest in, for example, read-head sensing applications.

The lab boasts advanced fabrication techniques (full clean room with lithography and pattern transfer techniques), a range of materials deposition tools (molecular beam epitaxy, sputtering, pulsed laser deposition, etc.) and sophisticated characterization techniques. Low temperature magneto-transport measurements (10mK to room temperature with fields up to 15T) will be carried out to detect spin injection, spin dynamics and quantum transport effects. A novel scanning electron microscope with polarization analysis was recently installed that allows for high resolution magnetic imaging in combination with variable temperature transport characterization and the project's exciting science is particularly enabled by a newly enhanced detector scheme for the instrument.

Potential applicants need to hold a Masters or equivalent degree in Physics or Materials Science. Experience in magnetic materials or spintronics is an advantage. In the recent Shanghai and CHE rankings Physics at Mainz was selected for the excellence group in Europe and top 5 in Germany and is the only physics department in Germany that houses both a Research Cluster and a Graduate School funded by the German Excellence Initiative. It is particularly strong in the area of condensed matter physics / material sciences with the Graduate School of Excellence Materials Science in Mainz. Very good candidates will be considered for this Graduate School that provides a structured graduate education with additional tailored training.

For further information and applications (including a full CV) contact:
Prof. Dr. Mathias Kläui
Institute of Physics, Johannes Gutenberg University Mainz; www.klaeui-lab.de

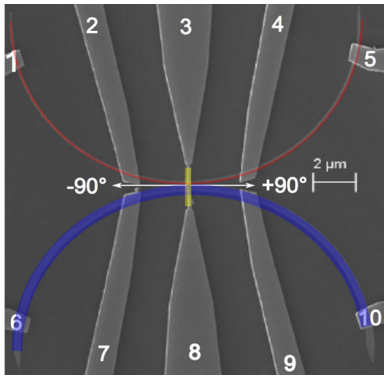

Image of a typical non-local spin valve device which employs pure spin currents. The device consists of two magnetic half-rings and a non-magnetic spin conduit.