



Walther-Meißner-Institut

Bayerische Akademie der Wissenschaften



Walther-Meißner-Seminar

Sondertermin

Walther-Meißner-Institut, Seminar Room 143

Date: **Tuesday, 04 October 2016, 10:15 h**

Speaker: **Dr. Hiroshi Naganuma**

*Unité Mixte de Physique
CNRS, Thales, Univ. Paris-Sud
Université Paris-Saclay
91767 Palaiseau
FRANCE*

Title: **Spin injection and tuneable spin-to-charge conversion at LaAlO₃/SrTiO₃ oxide interfaces**

Abstract:

The emergence of spin Hall effect (SHE) and inverse spin Hall effect (ISHE) as charge-to-spin conversion mechanisms offers a variety of novel spintronic functionalities, some of which do not require any ferromagnetic materials. However, the interconversion efficiency of SHE and ISHE is a bulk property that rarely exceeds ten percent, and does not take advantage of low-dimensional effects. Here, we make use of an interface-driven spin-orbit coupling mechanism – the Rashba effect – in the two-dimensional electron system (2DES) LaAlO₃/SrTiO₃ to achieve spin-to-charge conversion with unprecedented efficiency [1]. Through spin pumping, we inject a spin current from a NiFe film into the 2DES and detect the resulting charge current. We discuss the amplitude of the effect and its gate dependence on the basis of the electronic structure of the 2DES.

[1] E. Lesne *et al.*, Nature Mater. (2016), DOI: 10.1038/NMAT4726.