

**Universität Leipzig**

Fakultät für Physik und Geowissenschaften

Institut für Theoretische Physik

**Seminar**

# **Festkörperphysik**

Am Donnerstag, **28.04.2011**, um **15:15 Uhr** spricht

**Dr. Benoit Hackens**

IMCN, Pôle Nanophysique (NAPS), Université Catholique de Louvain, Belgium

über

## **"Scanning gate microscopy and spectroscopy of Coulomb islands in quantum Hall interferometers"**

**Abstract:** In the quantum Hall regime near integer filling factors, electrons are transmitted through edge states, confined at the borders of the device. In mesoscopic samples, however, edge states may be sufficiently close to allow electrons to tunnel, or to be transmitted through localized states ('Coulomb islands'). Here, we use the biased tip of a low temperature scanning gate microscope to alter tunneling through quantum Hall Coulomb islands localized inside a quantum ring patterned in an InGaAs/InAlAs heterostructure. Simultaneously, we map the quantum ring resistance and observe different sets of concentric resistance fringes, due to Coulomb blockade through each active Coulomb island, which allow to locate them precisely within the device [1]. Tuning the magnetic field and the tip voltage, we can extract spectroscopic information on the Coulomb islands and manipulate them.

[1] B. Hackens et al., Nature Communications 1, 39 (2010).

**Ort:** SR 224, Linnéstraße 5

*Interessenten sind herzlich eingeladen!*

gez. Prof. Haase und Prof. Rosenow