

## SONDERKOLLOQUIUM der TF am 13.12.2013

Sehr geehrte Damen und Herren,

wir laden Sie herzlich zum Kolloquium der TF am **13.12.2013 um 10:30 Uhr** ein. Auf Einladung von *Herrn Prof. Dr. J. McCord* hält

### **Herr Prof. Dr. Adekunle Adeyeye Department of Electrical & Computer Engineering, National University of Singapore**

einen Vortrag mit dem Titel:

#### **“Artificial Ferromagnetic Nanostructures: An Experimental Platform for Magnonics”**

#### **Abstract:**

Adekunle Adeyeye Department of Electrical & Computer Engineering, National University of Singapore  
Artificial ferromagnetic nanostructures with periodic lateral contrasts in magnetization are known as “magnonic crystals” (MCs), conceived as the magnetic analogue of photonic crystals. Recently, there is growing interest in the fundamental understanding of the spin wave propagation in MCs because of their huge potential in a wide range of applications such as microwave resonators, filters and spin wave logic devices. With advances in controlled nanofabrication techniques, it is now possible to synthesize high-quality periodic bi-component magnetic nanostructures with precisely controlled dimensions. The band spectrum of MCs consists of allowed states magnonic bands and forbidden states (magnonic gaps) that can be tuned by magnetic fields or geometrical parameters. We have shown that MCs represent a perfect system for studying excitations on disordered periodical lattices because of the possibility of controlled variation in the degree of disorder by varying the applied magnetic field [1]. We have also demonstrated functionality of magnetic logic based on a reconfigurable MC in the form of a meander-type ferromagnetic nanowire [2]. A ferromagnetic resonance method employing a microscopic coplanar waveguide was used to detect the logic state of the structure coded in its magnetic ground state. This talk will be divided into 3 parts: the first part will focus on strategies we have developed for synthesizing high-quality 1-D and 2-D MCs using deep ultra-violet lithography technique at 248 nm exposure wavelength. Using resolution enhancement techniques, we have fabricated arrays of ferromagnetic nanostructures with lateral dimensions and inter-element spacing below the conventional resolution limit of optical lithography tools. The second part will focus on results of our recent systematic investigation of both the static and dynamic properties of MCs using a combination of magneto-optical Kerr effect measurements, magnetic force microscopy, broadband ferromagnetic resonance spectroscopy, magneto transport measurements and micromagnetic simulations. In the third part, the concept of binary magnetic nanostructures will be introduced and their potential application in magnetic logic devices demonstrated.

J. Ding, M. Kostylev, and A. O. Adeyeye Physical Review Letters 107,047205 (2011). J. Ding, M. Kostylev, and A. O. Adeyeye Applied Physics Letters 100, 062401 (2012).

**Veranstaltungsort ist wie immer der Vortragsraum der Technischen Fakultät („Aquarium“) im Gebäude D, Kaiserstraße 2, 24143 Kiel. Wir erwarten eine interessante Veranstaltung und freuen uns über Ihr Erscheinen.**

Mit freundlichen Grüßen  
i.A. Claudia Martin