CARL VON OSSIETZKY universität OLDENBURG

Fakultät II *Informatik, Wirtschafts- und Rechtswissenschaften*
Department für Informatik

Kolloquium

Am Donnerstag**, dem 12. Juli 2012,** um **16:15 Uhr** hält

Dr. Bernard Legrand
Nano and MicroSYStems (NAM6)
Institut d'Electronique, de Microélectronique et de Nanotechnologie, France

einen Vortrag mit dem Titel

MEMS resonators at IEMN: a 12-year story from signal processing devices to Atomic Force Microscopy sensors

Der Vortrag findet im OFFIS, Escherweg 2, Konferenzraum F02 statt

Abstract
The presentation will give first an overview of the IEMN laboratory activities. IEMN is a joint research unit of CNRS gathering 500 people working in fundamental and applied research fields, encompassing semiconductor physics, nanosciences, micro and nano optoelectronics, nano and micro (bio) systems, telecommunications and acoustics. IEMN facilities consist in 1600 m^2 of cleanroom dedicated to micro and nano fabrication, an electrical characterization center with a particular expertise in microwaves up to the THz, and a near field microscopy center with STM and AFM operating in air and in vacuum.
Since 2000, IEMN has been developing a research activity in the field of electromechanical micro-resonators. These MEMS devices give access in the electrical domain to the properties of a mechanical resonance thanks to electromechanical transducers. Applications concern signal processing, e.g. filters or time references, but also sensing devices like inertial sensors, mass sensors and force sensors. In particular, MEMS resonators can be used as AFM probes, taking advantage of higher resonance frequencies and quality factors than those of standard AFM probes based on cantilevers. The presentation will focus on our recent development of MEMS based AFM probes that make use of vibrating rings in the range of 10 to 20 MHz. Integration of such force sensors in a commercial AFM set-up will be described as well as the imaging capabilities obtained on DNA origamis samples. Force resolution is currently in the range a few picoNewtons.

CV
Bernard Legrand (38) received the electrical engineering degree and a M.S. in electronics in 1996, and the Ph.D. degree in electronics from the Université des Sciences et Technologies de Lille, France in 2000. From 1996 to 2000 he was working on semiconductor nanostructures such as InAs quantum dots and silicon nanowires, and he was involved in their fabrication and characterization using techniques based on scanning probe microscopies. In 2000, he joined the Silicon Microsystems group of IEMN (Lille, France). His research was first focused on micromechanical actuators and sensors with ultimate performances for the characterization of nano-objects and for operation in a liquid environment. Since 2007, his main research topic concerns the development of MEMS based laser-less high-frequency AFM probes. Potential applications are foreseen in the field of time-resolved high-speed Atomic Force Microscopy of nanobiosystems in liquids. This research is currently funded by a 5-year "Starting Grant" of the European Research Council. Since 2001, Bernard Legrand has been a Research Scientist at CNRS and he is now the head of the NAM6 group (Nano And MicroSYStems) of IEMN. He co-authored more than 40 articles in peer-reviewed international journals and 50 communications in international conferences.

Eingeladen von: Prof. Dr.-Ing.habil. Sergej Fatikow