

## Physics seminar

**Tuesday, 30th November 2010 at 16h15**

**(coffee at 16h00)**

**Laboratory for Photovoltaics  
41 rue du Brill, L-4422 Belvaux  
Room F0. 1-1**

**Patrick Matgen  
Centre de Recherche Public - Gabriel Lippmann  
Environment and Agro-Biotechnologies**

### **“New research avenues in water resources management: monitoring, modeling and more”**

The ability to monitor terrestrial subsurface and surface water bodies with sensors mounted on aircrafts and satellites has been known for decades. Early launches of satellites and the availability of aerial photography allowed investigation of the potential to support hydrological applications from as far as space. There have been notable studies on integrating data from these instruments with hydrological modeling since the late 1990s. There is now a consensus among space agencies to strengthen the support that satellites can offer. This trend has stimulated more research in this area, and significant progress has been achieved in recent years in fostering our understanding of the ways in which remote sensing can support and advance flood forecasting. With flood frequency likely to increase as a result of altered precipitation patterns triggered by climate change, there is a growing demand for more data and, at the same time, improved flood forecasting. The aim is to develop more reliable flood forecasting systems over large scales that account for uncertainty in observations, modeling, and output. Over the last few decades, there have been major advances in the fields of remote sensing, particularly microwave remote sensing, and hydrological and hydraulic modeling. However, until recently, progress within both fields has been largely separate without any clear connection. Joining both research fields with a stronger integration of remote sensing of flood information and soil moisture and hydrologic-hydraulic modeling has only emerged over the last decade as a result of significant advances in microwave remote sensing techniques and high-performance computing encouraging a boost in modeling, with uncertainty. Recent research papers on integrating remote sensing with hydrologic-hydraulic modeling have studied (1) the retrieval of hydrology information from remote sensing observations (e.g., discharge, flood extent and area, water stage, soil moisture), and (2) the assimilation of remote sensing-derived data with prediction models. This presentation introduces the research carried out in these fields at the Centre de Recherche Public – Gabriel Lippmann.

## Next Physics Seminars

- **Tuesday, 14<sup>th</sup> December :** **Prof. Antoine Kies, Laboratory for Radiation Physics, the University of Luxembourg**  
**Campus Limpertsberg, 16:15** "Radiological and CO<sub>2</sub> investigations in a degassing mofette and around a volcano"
- **Tuesday, 11<sup>th</sup> Jan. 2011** **Johannes Fischer, PhD student, the University of Luxembourg**  
**in Belval, 16:15** "Annealing of binary stacks"
- **Tuesday, 25<sup>th</sup> Jan. 2011 :** **Prof. Dr.-Ing. Heike Emmerich,**  
**Campus Limpertsberg, 16:15** **Lehrstuhl Material-und Prozesssimulation Universität Bayreuth**  
"Phasenfeldsimulation"