Seminar Topic:

*Operando* transmission electron microscopy applied to perovskite solar cell devices

by Assistant Professor Martial Duchamp

Abstract

Martial Duchamp research group is focused on the applications of *in situ* and *operando* techniques inside a transmission electron microscope (TEM). These approaches allow to investigate devices under operation inside a TEM using heating and biasing TEM Protochip and DENSsolutions holders. This presentation will focus on electrically contacted perovskite solar cells devices. The degradation of the perovskite solar cell is monitored inside the TEM and the creation of the unwanted PbI$_3$ phase is located at atomic scale while cycling the devices. The *operando* TEM experiments are combined with chemical analysis, high resolution imaging and electron beam induced current (EBIC) analysis. The overall aim is to provide a new inside on the influence of the local atomic configurations on the electrical properties of devices and allows a finer analysis of the device properties than possible with other characterization technique.

About the Speaker

Martial Duchamp received his Master of Engineering and Research degree from the Ecole Nationale Supérieure de Physique, Grenoble (ENS-PG-INPG), France in 2005 and a Ph.D. degree from the department of Physic at the Ecole Polytechnique Fédérale Lausanne (EPFL), Switzerland in 2010 where he studied the growth, electrical and mechanical properties of ZnO nanowires. After holding a postdoctoral researcher at Danmarks Tekniske Universitet (DTU), Copenhagen, Denmark, he joined the Research Center Jülich in The Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons (ER-C) institute in 2011. In 2016, he joined NTU as an Assistant Professor.

Wednesday, 11 October 2017 Time: 2:00 pm to 3:00 pm  
Venue: MSE Meeting Room 1 (N4.1-01-28)  
Hosted by: Prof Timothy John White