Dresden University of Technology

Faculty of Physics

PHYSICS COLLOQUIUM



Speaker: **Dr. Ben Hourahine**
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Glasgow,
United Kingdom

Topic: **Computational modelling to understand defective semiconductors**

Time and place: Tuesday, December 15, 2026, **2:50 pm** – hybrid event
The colloquium will be held in REC/C213.
Online participation possible:
Zoom-Meeting: Meeting-ID: 642 8554 1414 / passcode: w8$nSJjy
https://tu-dresden.zoom-x.de/j/64285541414?pwd=6UOwTkSBlWvNv16PgF2K1qZtoUC8cS.1

Host: Prof. Eduard Lavrov

Abstract: The need to understand defects in semiconducting materials has been one of the major drivers for the development of new theoretical and computational techniques in materials science. The incentive is to both explain and predict experimentally accessible information on both the limit and possible applications of these materials. From simple early analytical models to modern machine learning methods there is now a wide range of way that insight can be gained, typically and most successfully when coupled to a wide range of experimental characterisation methods. Defects in semiconductor crystals can range from point-like impurities or damage, to extended structures spanning the macroscopic scale of the material. Typically trade-offs between the size of models that can be created (ideally these should be on larger scales than the defects themselves) and the level of physical rigour that can be included into the model (typically the fewer free parameters in the model the more expensive it becomes to use it).
In this seminar I will review some of the history of this area and discuss where current capabilities are in terms of both explanatory and predictive modelling of defects.

Bio: Ben is a Senior Lecturer at Strathclyde and has been based in Scotland since arriving in in 2005 as a Royal Society of Edinburgh Research Fellow, after being a Marie Curie post-doctoral research fellow at the Frauenhein group in the University of Paderborn (2003-04), following a PhD in theoretical Physics in Bob Jones' group at the University Exeter (2000) and post-doc work on hydrogen impurities in semiconductors. He is interested in modelling and understanding the problems that occur in materials and nanostructures and has developed several computational techniques for modelling and simulating a range of scales and physical effects.

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