



TECHNISCHE UNIVERSITÄT  
CHEMNITZ

# Institut für Physik Physikalisches Kolloquium



**Mittwoch, 24.01.2018, um 16:00 Uhr**

Ort: Reichenhainer Str. 90;  
Zentrales Hörsaal- und Seminargebäude,  
Raum 2/N013

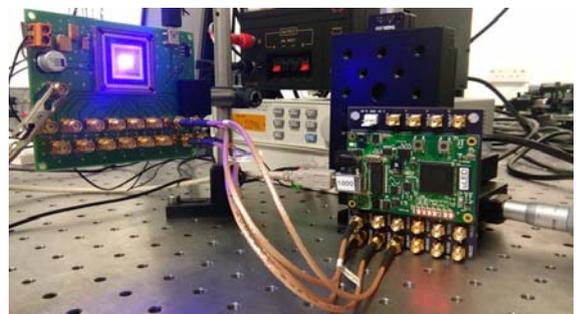
**Prof. Dr. Martin Dawson**

University of Strathclyde, Glasgow, Scotland

## **Lighting becomes intelligent: the new science and technology of digital illumination**

Traditional incandescent and fluorescent artificial lighting systems are basically passive illumination sources offering, if anything, only rudimentary control capability such as dimming. In strong contrast, the introduction of solid state lighting over the past 20 years, especially in the form of gallium nitride light emitting diodes (GaN LEDs), is transforming lighting into a semiconductor technology which has the potential to interface directly to very sophisticated control electronics. Early stage demonstrations of the potential of such smart lighting have barely shown what is possible and, indeed, now that customised nitride LEDs are beginning to be interfaced to CMOS electronics we can clearly see a move towards the true digitalisation of lighting. This has very profound implications, for scientific instrumentation, for the way we interface with the brain, for virtual and augmented reality systems, for communications, navigation and tracking, for control of autonomous systems and beyond. In this talk, I will give an overview of developments based on micro-pixelated GaN LED arrays interfaced to CMOS, which allow demonstration of many of the features and applications listed above. We will show how various forms of mask-free processing technology, bioinstrumentation, wireless optical communications and location and tracking systems can be implemented, and how these sources can, with suitable single photon-counting detection, even be operated down to levels of a few photons per bit of information, applicable, for example, in on-board-powered satellite communications and navigation systems and in underwater environments".

Martin D. Dawson is Professor and Director of Research at the University of Strathclyde's Institute of Photonics, which he helped found over 20 years ago. Since 2012 he has also been Head/Director of the UK's only Fraunhofer Research Centre, Fraunhofer CAP. Martin has authored or co-authored over 800 refereed journal and conference papers and has been involved in the creation and development of several spin out companies, most recently including mLED Ltd. He holds fellowships of the Institute of Physics (IOP), The IEEE, OSA and the Royal Society of Edinburgh and, in 2016, he was awarded the IOP's Dennis Gabor Medal and the IEEE Photonics Society's Aron Kressel Award.



Alle Zuhörer sind ab 15:45 zu Kaffee und Tee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:  
Prof. Dr. Ulrich T. Schwarz, Tel. 0371 531-30001



[www.tu-chemnitz.de/physik](http://www.tu-chemnitz.de/physik)