



## Visiting Professor

### Dragomir Neshev



Dragomir Neshev is an Associate Professor and Queen Elizabeth II fellow at the Australian National University. He has worked in the field of nonlinear optics at several research centres around the world and since 2002 he is with the Australian National University (ANU). He is the project leader on Functional Metamaterials at the Centre of Excellence for Ultrahigh-bandwidth Devices for Optical Systems (CUDOS) and leads the Experimental Photonics group at the Nonlinear Physics Centre, ANU. His activities span over several branches of optics, including nonlinear periodic structures, singular optics, plasmonics, and photonic metamaterials.

### Light emission in nanoscale environments

Monitoring of emission of single molecules or nanoparticles has proven to be an important tool for examining and sensing of various biological processes. However, with the advances of the ideas of fluorescent bio-markers it becomes increasingly important to develop techniques for control and detection of single fluorophores detection. This lecture will introduce some of the basic concepts of coupling of emitters to nanoscale structures. In particular, we will focus on the advantages of interaction of fluorophores with plasmonic nanostructures, such as metal nanoparticles and optical antennas. We will then overview some recent advanced concepts of nanoscale manipulation of the intensity, spectrum, lifetime, polarization, and quantum properties of the emitter's radiation.

**23 September 2013, 13:30, Seminar room of the Institute of Applied Physics, Albert-Einstein-Strasse 15, Jena**

### Topological insulators, graphene and their applications in optics

The field of topological insulators has emerged as a new important concept in solid state physics. This two part lecture will introduce some of the fundamental principles of topological insulators and will draw on their analogy with the electron transport in graphene structures. We will then review some of the recent ideas where such electronic properties have been applied in photonics.

**26 September 2013, 10:30, Seminar room of the Institute of Applied Physics, Albert-Einstein-Strasse 15, Jena**