

Fabrication and electronic functionality in nano-structures and -films– a case study in doping strategies

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There are many exciting fields in nano-science for researchers and students to do innovative and impactful research. Nanoelectronics now relies on our ability to fabricate devices at dimensions <10 nm. Nanostructures and thin-films at these scales bring much novelty, but also many headaches (and heartaches) when it comes to device fabrication, which should not alter the material properties in a negative way. In this talk, I will discuss the case study of semiconductor doping processes, which are required to locally alter the conductivity of the semiconductor for device fabrication. There are traditional and novel concepts, each with their advantages and disadvantages, many of which will depend on your perspective.

Dr. Ray Duffy is a Principal Researcher at Tyndall National Institute, and a Fellow in the School of Engineering and Architecture, University College Cork. His areas of research interest include Emerging Materials and Devices for future Nanoelectronic, ICT, Sensing, and Quantum applications, encompassing fabrication, characterisation, and modelling, of nanowire and thin film devices. He has over 160 research papers, and has given about 20 invited presentations at international conferences across the EU, USA, and Asia. He has been a European-MRS Symposium Organizer in 2022, 2019, 2017 and 2015, as well as being on the Technical Program Committee for several other conferences spanning areas of modelling (SISPAD), process technology (Ion Implantation Technology Conference) and novel electron devices (IEEE NANO).

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