Dr. Luca Sapienza MInstP (Secretary)
University of Southampton

Our research group investigates light-matter interactions at the nanoscale with the aim of both unveiling fundamental quantum phenomena and fabricating novel devices with added quantum functionalities. Our research activities cover the electromagnetic simulation, fabrication and optical characterisation of quantum devices, via time-resolved photoluminescence spectroscopy down to cryogenic temperatures, for future computation and communication quantum technologies based on single photons on a chip.

Our devices, made of GaAs and Si-based materials, consist of engineered, disordered and aperiodic photonic crystals, optical cavities and waveguides, embedding single epitaxial and droplet quantum dots as well as luminescent defect centres.

Ordinary members:

Mr. Paul Harrison
Ensilica Limited

For over 30 years now, my work has been a contribution into the fast moving world of micro electronics, which is now evolving into the nanotechnology realm. From being a design engineer in the early years of my career, with a background degree and PhD in physics, I have more recently been providing consultancy services to the semiconductor industry. During these engagements, some with major blue chip companies such as Ericsson and Philips Semiconductors, I have made a policy of talking about science. With so called "Lunch and Learn" outreach talks covering topics from my own research as well as the latest innovations from within the integrated circuit (IC) design community. In addition, I have also been invited to make Branch level presentations to the IET, as well as the IoP. For a number of years, I have also given an industry talk in several UK universities.

As part of continuous professional development I keep up to date with the latest developments in a broad range of scientific subjects. Membership of the IET also helps to facilitate this activity, along with regular updates on the web site content of leading companies and organisations. Several areas of physics are key to the fabrication and processing of semiconductor materials such as optics, electronics and increasingly atomic physics as feature sizes continue to scale towards the atomic limit. One example in optics is extreme ultraviolet lithography, which poses some of the most challenging questions in the transfer of physical principles into a high volume manufacturing environment.

My motivations have always been to do interesting work which is commercially viable. My passion is to talk about the fundamental science and to engage the interest of others, whilst remembering that the underlying principles are based on our fundamental understanding of the physical world.

Dr. Louise Hirst
Cambridge University

I am a University Lecturer jointly in the Department of Physics and the Department of Materials Science and Metallurgy at the University of Cambridge. My research focuses on the development of advanced, high efficiency III-V photovoltaics with a particularly interest in space power systems. This is includes the development and characterization of novel III-V alloys and quantum well systems, the design and

fabrication of alternative device geometries with integrated nanophotonic structures, as well as the development hot-carrier solar cell concepts for high solar energy conversion efficiency in a relatively simple, thermodynamically elegant system.

I obtained my PhD from Imperial College London in 2012. I was then awarded a National Academy of Sciences Research Associateship held at the U.S. Naval Research Laboratory in Washington DC, where I became a federal government staff scientist and Karles Distinguished Scholar Fellow, before moving to Cambridge in 2018.

Dr. Hareesh Chandrasekar
University of Bristol

My current research interests are in the device and reliability physics of wide band-gap compound semiconductor devices for RF and power switching applications, mainly gallium nitride transistors. A significant part of this involves developing novel electrical characterization techniques along with device modelling to better understand the impact of material growth and processing on device performance. For my PhD, I worked on the MOCVD of GaN on Si substrates and developing bottom-up, low-defect density platforms for hetero-epitaxial GaN growth.

Dr. Ian Sandall
University of Liverpool

I am currently a lecturer in the Department of Electrical Engineering and Electronics at the University of Liverpool, Prior to this I obtained my PhD in Physics from Cardiff University (on the characterization of quantum dot lasers) in 2007 and have worked for Philips Research in Eindhoven, and at The University of Sheffield (on mid infrared photodetectors). My research primarily concerns the development, characterization and application of semiconductor based electronic and photonic sensors.

I have experience designing, fabricating and characterizing a range of semiconductor based devices (including transistors, laser diodes and avalanche photodiodes). Recently this work has evolved into developing compact lab-on-a-chip based biosensors utilizing semiconductor electronic (and optoelectronic) devices as the active sensors.

Dr. Juan Pereiro Viterbo
Cardiff University

My research interests have been very wide so far. Most of my research has orbited around thin film growth and about designing new experimental equipment to solve novel physical problems. I have worked in III-N semiconductors, high temperature superconductivity, new superconducting materials, interface superconductivity, magnetism, electron and atomic force microscopy, X-Ray diffraction and nanostructure fabrication.

My current research focuses on the study of nucleation and relaxation phenomena in thin films and nanostructures of III-As semiconductors. Cardiff University's LEEM laboratory hosts a unique Molecular

Beam Epitaxy/Low Energy Electron Microscope system that allows real-time imaging of real and reciprocal space of the surface of the sample during growth with atomic resolution in z axis and 5 nanometer resolution in x-y directions. The low energy electrons also allow strain and compositional contrast. This is a very exciting system that we continue developing in order to enable the study of more complex systems.

Our goal is to understand the physics behind epitaxial growth and to provide complementary information to establish growth parameters to MBE laboratories across UK.