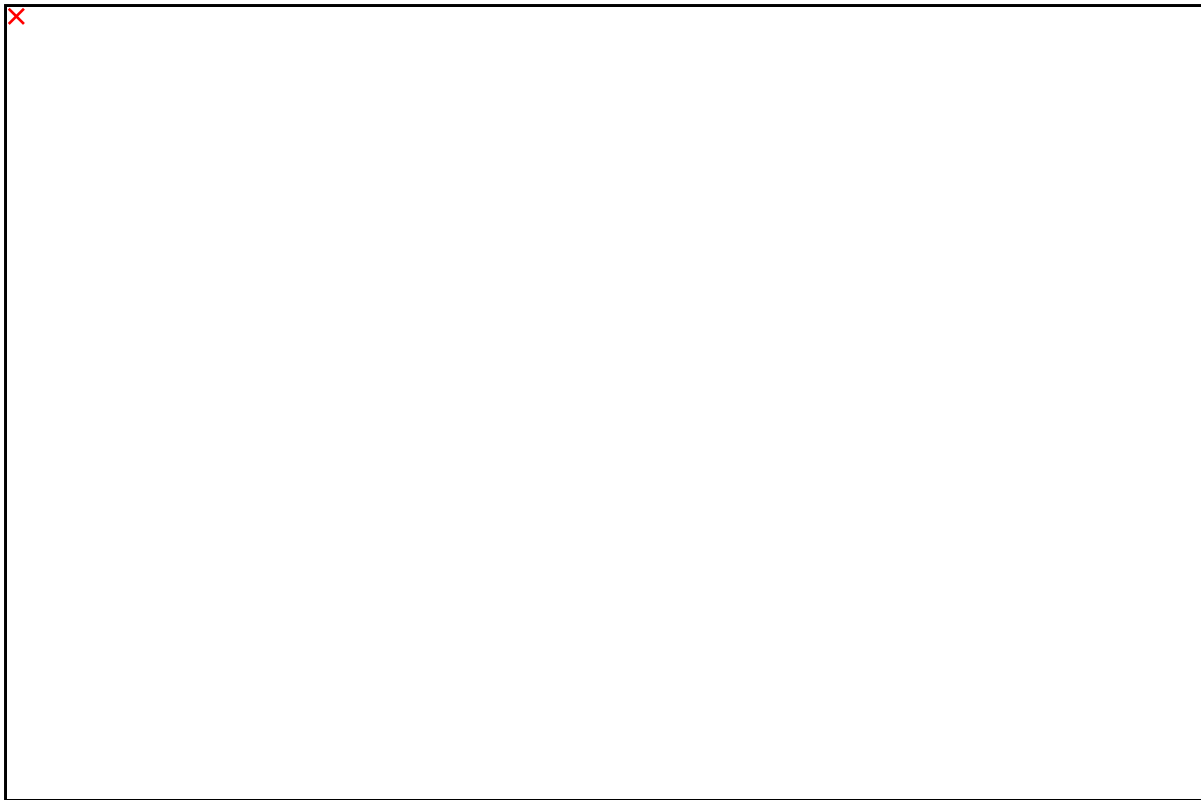




Epitaxy and Physics of Nanostructures



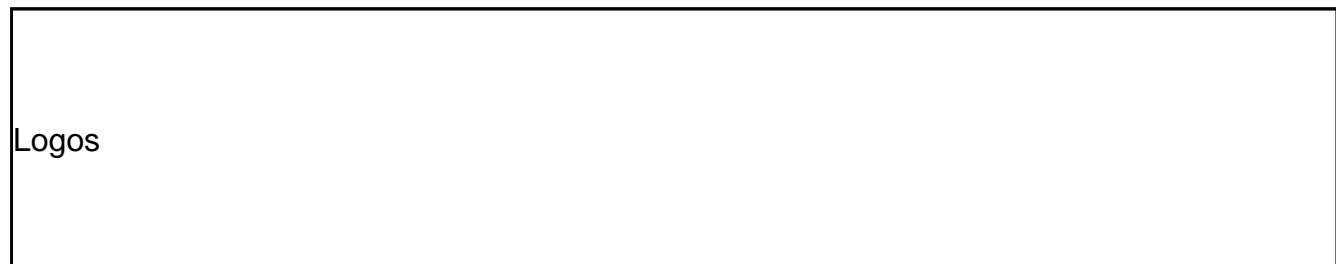
The Epitaxy and Physics of Nanostructures Group was established in January 2007, funded by [Science Foundation Ireland](#). Our mission focuses on the epitaxial growth of III-V semiconductors by metallorganic vapour phase epitaxy (MOVPE). Our interests involve growth physics and the development of innovative site controlled quantum dots. In the broader picture, we are collaborating so as to achieve high quality epitaxial layers and device structures for telecom applications.

Quantum dots (QDs) – sometimes referred to as “artificial atoms” – are nanometer-scale features grown in semiconductor materials. The characteristics of quantum dots make them ideal candidates for applications requiring sources of non-classical light such as quantum information processing and quantum key distribution. The QD size and distribution define the optical properties of the material, but with conventional growth techniques dots emerge at random sites and with varying dimensions.

One of the key challenges towards the fabrication of QDs useful for these novel information technologies is the possibility of reliably controlling the dot position, size and emission properties. The ability to tailor the energy and the excitonic wavefunction of the confined “atom like” states with a few simple parameters is of particular importance. At EPN we are working to develop innovative site controlled QD structures so to achieve this capability.

We are one of a cluster of research groups working in photonics in Cork, as part of the recently-created Tyndall National Institute, which combines research activities at the previously existing NMRC (National Microelectronics Research Centre) with other groups in [UCC](#) and [CIT](#), including the Photonics Theory Group, the Photonics Systems Group and the Optoelectronics Group.

We are member of the [Irish Photonic Integration Centre](#)





Logos

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