NSERC CREATE **TOP-SET** Un programme *FONCER* du CRSNG

Séminaire

Le mardi 11 décembre 2018, 15h45
Des rafraîchissements seront servis dès 15h15
Complexe de recherche avancée, pièce 233
Université d'Ottawa, 25, rue Templeton
Le séminaire se déroulera en anglais.

Seminar

Tuesday, December 11, 2018, 3:45 p.m.
Refreshments to be served starting at 3:15 p.m.
Advanced Research Complex, room 233
University of Ottawa, 25 Templeton Street

Nanostructured epitaxial crystal growth for lasers and quantum light sources

Philip Poole, National Research Council Canada

Abstract: 3-dimensional nanostructured semiconductors have been predicted to show many advantages over their more conventional 2-dimensional counterparts. I will discuss two ways to use an inherently 2D (i.e. planar) growth process to create 3D nanostructured materials for optoelectronic devices. Strain engineering is used to create arrays of quantum dots to replace quantum wells in lasers designed for data communications at 1.55 µm. These devices exhibit performance properties (e.g. mode locked pulse duration, optical linewidth, noise characteristics, multiwavelength lasing) that outperform traditional devices. At a more fundamental level, single quantum dots have been proposed as an ideal source of non-classical light for use in quantum key distribution and quantum computing. A major hurdle has been the isolation of individual dots and the manipulation of their optical environment. We solve these problems through the selective area growth of nanowires containing individual quantum dots. Excellent single photon purity, entanglement and indistinguishability have been demonstrated.

Bio: Dr. Philip Poole is a Principal Research Officer in the Advanced Electronics and Photonics Research Centre, National Research Council Canada (NRC). Dr. Poole earned his doctoral degree in Solid State Physics from Imperial College, London University in 1993, and joined the NRC later that year. Since then he has held many roles such as researcher, project lead, and group leader for the Epitaxy group. His work has covered many areas of III-V semiconductor research including optical spectroscopy, quantum well intermixing and 21 years of experience in chemical beam epitaxy growth of III-V compounds. His research interests have focused on the epitaxial growth of InP-based structures for optoelectronic devices, taking advantage of the novel properties of quantum dots. This has included fundamental studies on the use of selective area epitaxy to control the nucleation of InP nanowires containing individual quantum dots for quantum information purposes.

TOP-SET est un programme de formation FONCER du CRSNG en puissance optoélectronique ayant pour but de façonner une cohorte de personnel hautement qualifié détenant des connaissances approfondies en systèmes optoélectroniques pour joindre les rangs d'équipes de recherche et développement.

Pour de plus amples renseignements sur TOP-SET, veuillez consulter create-topset.eecs.uottawa.ca/fr.

NSERC CREATE Training in Optoelectronics for Power: from Science and Engineering to Technology (**TOP-SET**) is a training program that aims to form a cohort of highly qualified personnel with comprehensive understanding of optoelectronic systems, capable of joining advanced R&D teams.

For further details regarding TOP-SET, go to create-topset.eecs.uottawa.ca.

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