

## Séminaire

Le mardi 27 février 2018, 15h30  
Des rafraîchissements seront servis dès 15h  
Complexe de recherche avancée, pièce 233  
Université d'Ottawa, 25, rue Templeton  
\*Le séminaire se déroulera en anglais.\*

## Seminar

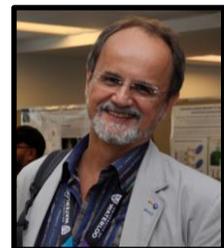
Tuesday, February 27, 2018, 3:30 p.m.  
Refreshments to be served starting at 3 p.m.  
Advanced Research Complex, room 233  
University of Ottawa, 25 Templeton Street

### Towards high quality InSb quantum wells and wires – A quest for topological quantum computers

Zbig Wasilewski, University of Waterloo

**Abstract:** One of the most troublesome roadblocks to practical quantum computers is undesirable coupling of qubits to noisy external environment which perturbs the fragile quantum states involved in information retention and processing. Topological superconductivity supporting so called protected boundary states and quasi-particles such as Majorana fermions may be the solution. InSb quantum wells (QW) are one of the most promising material systems for the top-down approach in realizing Majorana bound states. Because of the lack of suitable semi-insulating substrates lattice-matched to InSb such QWs are typically grown on AlInSb metamorphic buffers deposited on GaAs substrates; their quality severely limits the quality of InSb QWs. The main challenges are high densities of threading dislocations which drive the spiral growth mode, leading to the formation of undesirable surface hillocks. After introducing the relevant background I will discuss our quest towards elimination of these features by fine-tuning interactions between atomic steps on the surface.

**Bio:** Zbig Wasilewski is a Professor in the Electrical and Computer Engineering Department at the University of Waterloo. He is internationally renowned for his contributions to the field of Molecular Beam Epitaxy, quantum-dot and quantum-well photonic devices, as well as quantum structures based on high mobility 2D electron gases. Dr. Wasilewski earned his doctoral degree from the Institute of Physics of the Polish Academy of Sciences in 1986, based on his magneto-optical studies of semiconductors under high hydrostatic pressures. In 1988, after a post-doctoral appointment at the Imperial College, London, he joined the National Research Council of Canada, focusing on molecular beam epitaxial growth and characterization of quantum structures based on III-V semiconductor compounds. In July 2012, Dr. Wasilewski joined the University of Waterloo as a full Professor and Waterloo Institute for Nanotechnology Endowed Chair, where he established the Quantum-Nano Centre MBE Facility (QNC-MBE).



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 rejoindre les rangs d'équipes de recherche et développement.

Pour de plus amples renseignements sur TOP-SET, veuillez consulter [create-topset.eecs.uottawa.ca/fr](http://create-topset.eecs.uottawa.ca/fr).

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