IEEE
Electron Devices Society
2009 PhD Student Fellowship
Is awarded to
Pierre-Yves Delaunay
Northwestern University
Evanston, IL, USA

For the demonstration of significant ability to perform independent research in the field of electron devices and a proven record of academic excellence

Cor Claeyss
President, Electron Devices Society

December, 2009
Baltimore, MD, USA
2010 IEEE International Integrated Reliability Workshop (IIRW)

The 2010 IEEE International Integrated Reliability Workshop (IIRW), sponsored by the IEEE Reliability Society and the IEEE Electron Devices Society, will be held at the Stanford Sierra Conference Center on the shore of Fallen Leaf Lake near South Lake Tahoe, California, October 17–21, 2010. This workshop provides a unique forum for open and frank discussions of all areas of reliability research and technology for present and future semiconductor applications.

Hot reliability topics include: transistor reliability including hot carriers and NBTI/PBTI, high-k and nitrided SiO, dielectrics, SiGe and strained Si, III-V, SOI, novel device reliability, organic electronics,

(continued on page 7)
Corporation Semiconductor Company, Tokyo, Japan from 2005 to 2009.

Mark J.W. Rodwell of the University of California, Santa Barbara, California, USA, has been named the recipient of the 2010 IEEE David Sarnoff Award. His citation states, "For development of millimeter-wave and sub-millimeter-wave InP bipolar transistors and integrated circuits."

Mark J.W. Rodwell's development of millimeter- and sub-millimeter-wave indium phosphide (InP) heterojunction bipolar transistors (HBTs) has extended the limits of high-frequency radio, high-speed optical communications and powerful imaging applications. During the mid 1990's, Dr. Rodwell sought a breakthrough in the InP HBT fabrication process to boost the device's maximum frequency of oscillation and extend its circuit applications beyond microwave frequencies. Transistors and a series of circuits fundamental to high-frequency communications were subsequently demonstrated, establishing the feasibility of transistors with operating frequencies as high as 1-3 terahertz. Dr. Rodwell's work has enabled development of ultra-high speed wireless radios/links in the previously never reached spectra of the "Terahertz Gap" for short-distance and portable communications and high-resolution cameras/imagers for detecting concealed objects.

An IEEE Fellow, Dr. Rodwell is currently a professor in the Department of Electrical and Computer Engineering and director of the Nanofabrication Laboratory at the University of California, Santa Barbara.

Alfred U. Mac Rae
EDS Vice-President of Awards
Mac Rae Technologies
Berkeley Heights, NJ, USA

Status Report from the 2009 EDS PhD Student Fellowship Winners

In 2009, the IEEE approved the establishment of the Electron Devices Society PhD Student Fellowship Program. The Program is designed to promote, recognize, and support graduate level study and research within the Electron Devices Society's Fields of Interest: which include: All aspects of the engineering, physics, theory, experiment and simulation of electron and ion devices involving insulators, metals, organic materials, plasmas, semiconductors, quantum-effect materials, vacuum, and emerging materials. Specific applications of these devices include bioelectronics, biomedical, computation, communications, displays, electro and micro mechanics, imaging, micro actuators, optical, photovoltaics, power, sensors and signal processing.

In deference to the increasing globalization of our Society, at least one fellowship is to be awarded to students in each of three geographical regions: Americas, Europe/Middle East/Africa, and Asia & Pacific.

In July 2009, EDS announced the winners of the 2009 Fellowships. The four winners were:
- Faisal Amir, The University of Manchester, Manchester, UK
- Pierre-Yves Delaunay, Northwestern University, Evanston, IL, USA
- Ximeng (Simon) Guan, Tsinghua University, Beijing, China
- Rinus Lee Tek Po, National University of Singapore, Singapore

The winners are pursuing distinctly different research topics for their doctoral degrees and the following are brief progress reports written by the award winners.

Faisal Amir is pursuing his Ph.D. under the supervision of Professor Mohamed Moussov in the School of Electrical and Electronic Engineering, University of Manchester, United Kingdom. He is using physically based, predictive modeling of advanced graded gap Gunn diode for use in millimeter waves and terahertz frequencies. Gunn diode models for 77 & 125 GHz second harmonic and 100 GHz fundamental have been realized for the first time and agree extremely well with experimental data. These high frequencies have, hitherto, been outside the capabilities of conventional GaAs Gunn diodes. He has authored or co-authored ten scientific papers which have appeared in top-tier journals and international conferences.

Pierre-Yves Delaunay received the IEEE EDS fellowship in 2009 and is now pursuing his research on infrared cameras based on type-II InAs/GaSb superlattices. He further improved the sensitivity of the imager using new processing techniques. Thanks to the addition of a custom-designed anti-reflective coating, the pixels are now converting 90% of the incoming infrared