



*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*



A handwritten signature in orange ink, appearing to read 'Cor Claey'.

*Cor Claey
President, Electron Devices Society*





IEEE ELECTRON DEVICES SOCIETY

Newsletter

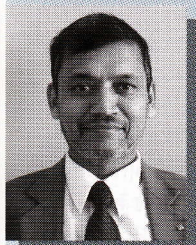
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EDS PRESIDENT'S MESSAGE



Renuka P. Jindal
EDS President

On January 1 2010, I became the 22nd President of the Electron Devices Society. Being EDS President is a great honor and I want to take a few moments to share with you, the members of EDS, my vision for the Society and outline what we can together hope to achieve in the coming years.

First and foremost, **EDS serves its members.** The fundamental question we must ask ourselves before starting any new initiatives is, "what is the value of this effort to our members?" The mission statement we officially adopted at our December Administrative Committee (AdCom) Meeting embodies this "members first" philosophy: *To foster professional growth of its members by satisfying their needs for easy access to and exchange of technical information, publishing, education, and technical recognition and enhancing public visibility in the field of Electron Devices.*

This is an important point to remember because, although EDS clearly conducts business,

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2010 IEEE INTERNATIONAL INTEGRATED RELIABILITY WORKSHOP (IIRW)



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The main lodge at the Stanford Sierra Conference Center. The center provides lodging, meals and meeting facilities as well as excellent recreation including hiking in the Desolation Wilderness and boating on Fallen Leaf Lake

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 SiO₂ dielectrics, SiGe and strained Si, III-V, SOI, novel device reliability, organic electronics,

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YOUR COMMENTS SOLICITED

Your comments are most welcome. Please write directly to the Editor-in-Chief of the Newsletter at ninoslav.stojadinovic@elfak.ni.ac.rs



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."

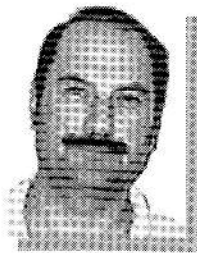
Mark J.W. Rodwell's development of millimeter- and sub-millimeter-wave indium phosphide (InP) hetero-

junction 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 ul-

tra-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



*Agis A. Illiadis
EDS PhD Student
Fellowships Chair*

In 2000, 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 Mismous in the School of Electrical and Electronic Engineering, University of Manchester, United Kingdom. He is using physically based, predic-

tive modelling of advanced graded gap gun diodes for use in millimetre 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