

iNEER Award Nomination Dossier

Nominator: Dr. Rajendra Singh, Fellow IEEE, Fellow SPIE, Fellow AAAS and Fellow ASM
D. Houser Banks Professor and Director, Center for Silicon Nanoelectronics
Holcombe Department of Electrical and Computer Engineering
Clemson University, Clemson, SC 29634-0915
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Nominee: Dr. M. Jamal Deen, Fellow RSC, Fellow CAE, Fellow IEEE, Fellow EIC, Fellow ECS
and Fellow AAAS
Professor and Canada Research Chair in Information Technology
Electrical and Computer Engineering Department, CRL 226
McMaster University, 1280 Main Street West, Hamilton, ON L8S 4K1, Canada
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Category of Award: Achievement

Suggested Citation: For pioneering contributions and leadership in research and in international education and research collaborations

Will Nominee Be Present at Awards Ceremony? Yes

Summary of Accomplishments:

Professor M. Jamal Deen of McMaster University is an international leader in microelectronics and optoelectronics and one of the world's foremost engineering scientists. His eminence in research is based on the powerful models he has developed for the accurate analysis and design of high-performance semiconductor devices and circuits, and the experimental techniques he has innovated to study important device properties. A highly accomplished researcher, inventor and a prolific scholar, his device models and experimental innovations are used worldwide. He is also noted for his mentoring of engineers and scientists, his competency and proficiency as a teacher, and his effectiveness in technology transfer to industry.

Through his international collaborations in the past two decades, Professor Deen has had a significant impact in microelectronics and optoelectronics research and education at collaborating institutions in India, Mexico, Brazil, Trinidad, France, Spain, Sweden, Russia and China. He has hosted students and Professors from these countries. As specific examples, he has served as an External Examiner of the undergraduate physics degree program of the University of the West Indies, Trinidad for six years; as external examiner and co-supervisor of doctoral theses for students from Mexico, France, India and Sweden, as a Member of the Technical Program Committee and Vice-chair of the IEEE International Caribbean Conference on Circuits, Devices and Systems (ICCDCS) for the past eight years; and as the Chair and Member of the International Advisory Committee of CODEC '04 and '06 in Calcutta India (2004 and 2006 respectively), helping to bring top researchers from around the globe to these Conferences. His most recent activity has been the designated Canadian Lead of a "Nanotechnology, Bio-nanotechnology" mission to India in March 2007 to identify some of the key Indian researchers in these fields for future funded research collaborations as part of bilateral Science and Technology (S&T) Agreement signed by India and Canada. He was the principal author of the 29-page report providing an overview of the nano and bio-nano activities in five selected cities/urban centers in India – Delhi, Kanpur, Kharagpur, Kolkata and Pune. This report, commissioned by the Government of Canada, is currently being used to evolve the India-Canada S&T agreement in the nano and bio-nano areas.

Major Engineering and Scientific Achievements

- **Specific Outstanding Engineering Accomplishments:** Dr. Deen has successfully transferred powerful physics-based, engineering and circuit models for the accurate analysis and design of high-performance semiconductor devices and circuits, and innovative experimental techniques, to industries and research laboratories in Canada and abroad. Examples of end-users of his models and experimental innovations include(d) Bell Northern Research, Gennum, Mitel, Nanowave Technologies, Nortel, Zarlink, National Research Council, Ottawa and Victoria (Canada); Conexant, IBM, National Semiconductor, RFMD, Rockwell,

Skyworks, Texas Instruments, NASA in Cleveland (USA); and Sony (Japan). Three examples of specific outstanding engineering accomplishments that have been successfully commercialized are described. First, Dr. Deen co-invented the solid-state microscope that is described in three patents. Xillix Corporation, which was established on the basis of these patents, has successfully commercialized the microscope for biomedical applications. Second, he was the key contributor to three patents on a novel semiconductor device (gate-controlled lateral bipolar transistor, GCLBT), a modulation circuit and an automatic-gain control amplifier using the GCLBT, and these patents are owned by Nortel. This GCLBT is used to implement bipolar circuits using commercial silicon technology by many industries. Third, he and his student successfully developed a noise measurement system to understand and predict the reliability issues of dielectric passivation of avalanche photodiodes. This work was critical to Nortel maintaining their leadership position (financially and technically) in the design and manufacture of reliable photodetectors for fiber-optic communication systems.

- **Modeling and Design of High-Performance Photodetectors:** Prof. Deen has developed accurate physics-based models for the most advanced photodetectors and has used these models and engineering versions of them for optimized designs and accurate performance predictions of entire photoreceivers. He has used his models to design optimized photodetectors for multi-gigabit applications that was commercialized by his industrial collaborator. His models have also been used by experimental researchers worldwide to guide their fabrication of better photodiodes.
- **Noise in Modern Semiconductor Devices:** Prof. Deen has produced the best work on experiments and modeling of high-frequency and low-frequency noise in semiconductor devices, especially silicon transistors. He has developed analytical and numerical high-frequency and low-frequency noise models for silicon transistors for high performance applications that are incorporated into popular simulation programs and are used by his industrial collaborators and other industries and academic researchers worldwide. He has studied noise dispersion in transistors and performed definitive experiments to prove the origin of noise in polysilicon emitter bipolar transistors. He innovated noise parameter de-embedding and extraction of the intrinsic noise sources in any active device similar to what has been done for de-embedding of scattering parameters. In the field of low- and high-frequency noise in semiconductor devices, he is generally regarded as the leading authority world-wide.
- **Polymer or Plastic Field-Effect Transistors (PFETs):** Prof. Deen is the Canadian pioneer in polymer transistors. He started research work in this subject in the late 1980's with his polymer chemist colleague (Prof. Holdcroft), building upon his earlier fundamental work in polymer insulators for superconducting devices while he was a graduate student in the early 1980's. He was the first to propose circuit-type models for these PFETs. He developed a new technique, called photolytic tuning, to optically alter the thickness of the semiconducting polymer film and to passivate it at the same time. This technique also allowed him to study bulk and field-induced charge transport in the polymer semiconductor. He conducted definitive experiments to prove the existence of the accumulation layer and its modulation by the gate voltage. He has studied the effects of side-chain length on the properties of PFETs, their electrical instability and electrical properties. He used his work on low frequency noise, electrical instability and performance variability in PFETs to propose the injection-drift limited model for charge transport.
- **Innovations in Experimental Techniques:** Prof. Deen has developed novel experimental techniques to improve the understanding and modeling of important phenomena at the silicon-silicon dioxide interface in the dominant transistor technology, the field-effect transistor. He pioneered new experimental techniques to study and distinguish different types of defects in field-effect and bipolar transistors and innovated a technique to predict early modes of failures in transistors and the spatial profiling of defects in MOSFETs. He also developed experimental algorithms for determining the parasitic effects in narrow metal-oxide semiconductor (MOS) field-effect transistors (FETs) and physics-based extraction of their threshold voltage.

Letters of Support:

Dr. Roberto S. Murphy Arteaga, Academic Dean and Professor, INAOEP, Apdo. Postal 51 y 216, C.P. 72000 Puebla, México. E-mail : rmurphy@ieee.org

Dr. N.R. Das, Reader, Institute of Radio Physics and Electronics, University of Calcutta, 92 Acharya P C Road, Calcutta - 700 009, INDIA. E-mail: nrd@ieee.org

Dr. M. Jamal Deen FRSC FCAE FIEEE FECS FAAAS FEIC

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EDUCATION

Ph.D. (Electrical Engineering and Applied Physics), Case Western Reserve University, Cleveland, OH, U.S.A (July 1985).

M.S. (Electrical Engineering and Applied Physics), Case Western Reserve University, Cleveland, OH, U.S.A (May 1982).

B.Sc. (Physics/Mathematics), University of Guyana, Turkeyen, Guyana (June 1978).

ACADEMIC EXPERIENCE

Canada Research Chair	2001 -	Elect. & Computer Engineering	McMaster University, Hamilton, Ontario.
Professor	1999 -	Elect. & Computer Engineering	McMaster University, Hamilton, Ontario.
Associate Chair	2000 - 2003	Elect. & Computer Engineering	McMaster University, Hamilton, Ontario.
Associate Director	1995 - 1998	Engineering Science	Simon Fraser University, Vancouver, BC.
Visiting Professor	Summer 1997	Electrical Engineering	Delft Univ. of Technology, Nederland.
Professor	1993 - 2002	Engineering Science	Simon Fraser University, Vancouver, BC.
Associate Professor	1989 - 1993	Engineering Science	Simon Fraser University, Vancouver, BC.
Assistant Professor	1986 - 1989	Engineering Science	Simon Fraser University, Vancouver, BC.
Assistant Professor	1985 - 1986	Comp. Sci. & Elect. Eng.	Lehigh University, Bethlehem, PA.

INDUSTRIAL OR NON-ACADEMIC EXPERIENCE

Directeur de Recherche	2002-2003	Semiconducteur Groupe	CNRS, Montpellier, France.
Directeur de Recherche	Summer 1998	LPCS	CNRS, Grenoble, France.
Visiting Scientist	Summer 1994	Device Technology (P813)	Northern Telecom Ltd., Ottawa.
Visiting Scientist	1992-1993	Device Technology (P813)	Northern Telecom Ltd., Ottawa.
Visiting Scientist	Summer 1986	Herzberg Inst. of Astrophysics	National Research Council, Ottawa.

AWARDS/HONORS

Fellow	CAE, The Canadian Academy of Engineering (April 2007).
Fellow	RSC, The Royal Society of Canada (June 2006).
Fellow	AAAS, The American Association for the Advancement of Science (Oct. 2005).
Fellow	ECS, The Electrochemical Society (May 2004).
Fellow	EIC, The Engineering Institute of Canada (December 2003).
Fellow	IEEE, The Institute of Electrical and Electronic Engineers (November 2002).
Honorary Member (highest honor)	WIF, The World Innovation Foundation (May 2006).
Humboldt Research Award	Alexander von Humboldt Foundation (April 2006).
IBM Faculty Award	IBM Corporation, USA (2006).
Premium Award	The Institution of Engineering Technology (formerly IEE) (2007).
Best Student Poster Paper Award	Annual Micronet Workshop, Ottawa (May 2005).
Best Paper Award	The Institution of Engineering Technology (formerly IEE) (2004).
Best Student Paper Award	IEEE Canadian Conference on Elec. & Comp. Engineering (2004).

AWARDS/HONORS (continued)

Best Student Paper Award	SPIE Conference on Noise in Devices and Circuits (2003).
Best Invited Paper Award	IEEE Custom Integrated Circuits Conference (2002).
Distinguished Lecturer	IEEE - Electron Device Society (2002 - present).
Thomas D. Callinan Award	Electrochemical Society – Dielectric Science & Technology Div. (2002).
Distinguished Researcher Award	Province of Ontario (July 2001).
Canada Research Chair	Government of Canada (2001 -).
IEEE Outstanding Branch Counselor and Advisor Award for Canada - Region 7 (April 1994).	
IEEE Exemplary Student Branch Award for SFU (Deen - Counsellor and Kwan - Student Chair) - Region 7 (1995).	
Reward and Recognition Award	Silicon Technology Division (P810), Northern Telecom, Ottawa (1993).
NSERC Senior Industrial Fellow	Device Technology (P813), Northern Telecom, Ottawa (1993).
Listed in	Canadian Who's Who (2007).
Listed in	Academic Keys Who's Who in Higher Education Engineering (2006)
Listed in	American Men & Women of Science (from 17th Edition, February 1989).
Member	Eta kappa Nu – Electrical Engineering Honor Society (1985)
American Vacuum Society Scholar	Elect. Eng. & App. Phys. Department, CWRU (1983-1984).
Fullbright-Laspau Scholar	Elect. Eng. & App. Phys. Department, CWRU (1980-1982).
Irving Adler's Prize	Best graduating mathematics student at the University of Guyana (1978).
Chancellor's Medal	Second best graduating student of the University of Guyana (1978).

EDITORIAL RESPONSIBILITIES

- Member, Editorial Board, *The Journal of Nanoelectronics and Optoelectronics* (March 2007-).
- Member, Editorial Board, *Open Journal of Applied Physics* (January 2007-).
- Member, Advisory Board of Editors, *International Journal of High Speed Electronics and Systems* (June 2006 -).
- Member, Editorial Board, *Microelectronics Journal* (May 2006-May 2009).
- Regional Editor, *IEEE Electron Devices Society (EDS) Newsletter* – Canada and Central USA (Nov 2004-).
- Member, Editorial Board, *The Journal of Nanoscience and Nanotechnology* (September 2004-).
- Editor – Solid-State, *IEEE Transactions on Electron Devices* (April 2001 -).
- Member, Editorial Advisory Board, *Interface, an Electrochemical Society Publication* (April 2001 -)
- Executive Editor, *Fluctuation and Noise Letters* (March 2001 -).
- Guest Editor, Special Issue of *IEEE Transactions on Electron Devices on Advanced Compact Models and 45-nm Modeling Challenges* (September 2006).
- Guest Editor, Special Issue of *IEE Proceedings - Circuits, Devices and Systems* – Special Issue of **IEEE/SPIE International Conference on Computers and Devices for Communications (CODEC) 2004** (October 2005).
- Guest Editor, *Interface, an Electrochemical Society Publication* (Summer 2005).
- Special Issue of *IEE Proc. - Circuits, Devices & Systems* on Selected Topics on Noise in Devices & Circuits (April 2004).
- Guest Editor, *Fluctuation and Noise Letters* - Special issue on Noise in Devices and Circuits (2004).
- Member, Editorial Board, *IEEE Transactions on Microwave Theory and Techniques* (2001-2002).
- Guest Editor, Special Issue of *IEE Proc. - Circuits, Devices & Systems* on Sel. Topics on Electronic Noise (Feb. 2002).
- Guest Editor, Special Issue of *International Journal of High Speed Electronics and Systems* (IJHSES) on CMOS RF Modeling, Characterization and Applications (2002).

RESEARCH INTERESTS

Microelectronics/Nanoelectronics, Optoelectronics - Device Physics and Modeling, Radio Frequency Integrated Circuits, Plastic Microelectronics, Device Characterization, Biosensors; Design of Integrated Systems; Imaging Systems.

CAREER PUBLICATION RECORD

Publications of Refereed Book Chapters or Edited Books:		31
• Edited Books or Conference Proceedings	14	
• Invited Book Chapters	15	
• Contributed Book Chapters	2	
Patents:		6
Refereed Journal Publications:		190
• Invited Journal Papers	22	
• Journal Papers	168	
Refereed Conference Publications:		179
• Plenary , Keynote or Invited Refereed Conference Publications	56	
• Contributed Conference Papers	123	
Conference Publications (Only Abstracts and Extended Abstracts):		106
• Plenary, Keynote or Invited Conference Abstracts	29	
• Contributed Conference Abstracts	77	
Commissioned Technical Reports:		58

PROFESSIONAL CITIZENRY/SERVICE

• Offices Held in Professional Societies	20
• Conferences – Organizer, Chair, Program Committee Member, etc.	90
• Session Chair/Co-Chair at Conferences/Symposia	77
• Reviewer for	25 journals
• Reviewing for	20 conferences/symposia
• Invited Seminars - University, Industry and Research Organizations	116
• Short Courses - Industry, University, Conference	8

PERSONNEL TRAINING (Career)

• Visiting Professors, Post-Doctoral Fellows and Research Associates	28
• Ph.D. Students	25
• M. Eng and M.A.Sc. Students	34
• B.A.Sc. Students	26

RESEARCH GRANTS IN RECENT PAST (From 2001)

\$27,621,335

• Sole Investigator for previous five years (2001-2006)	\$4,001,423
• PI or Co-investigator for previous five years (2001-2006)	\$18,889,714
• Sole Investigator for current year	\$361,000
• PI or Co-investigator for current year	\$4,369,198

Professional Citizenry/Service (only from 2005)

- Member, Adcom, **IEEE Electron Devices Society** (2006-07).
- Member, *Compact Modeling Committee*, **IEEE Electron Devices Society** (2004-06).
- Member, *Educational Activities Committee*, **IEEE Electron Devices Society** (2002-05, 2006-08).
- Member, *Optoelectronic Devices Committee*, **IEEE Electron Devices Society** (2002-03, 2003-05, 2006-08).
- Member, *Education Awards Committee*, **IEEE** (2003-06).
- Member, *ICNF International Advisory Committee* (2003-).
- Member , *Board of Directors*, **The Electrochemical Society** (2004-06).

- Chair, *Dielectric Science and Technology Division*, **The Electrochemical Society** (2004-06).
- Member, *Nanotechnology Subcommittee*, **The Electrochemical Society** (2003-05).
- Member, *Governing Body, Dielectric Science and Technology Division*, **The Electrochemical Society** (1994-96, 1996-98, 1998-2000, 2000-02, 2002-04, 2004-06).
- Member-at-Large, *Electronics Division*, **The Electrochemical Society** (2003-05, 2005-07).
- Member, Programme Committee, **European Nano Systems 2006**, Paris, France (14-15 December 2006).
- Co-Organizer, *Bioelectronics, Biointerfaces, and Biomedical Applications 2*, **210th Meeting of the Electrochemical Society**, Cancun, Mexico (29 October – 3 November 2006).
- Member, *North & South America Regional Technical Committee*, **The 12th International Meeting on Chemical Sensor** (IMCS-12), Columbus, Ohio (13-16 July 2008).
- Member, *International Advisory Committee*, **IEEE International Conference on Electron Devices and Solid-State Circuits 2007** (EDSSC2007), Southern Taiwan University, Tainan, Taiwan (20-22 December 2007).
- Member, *Scientific Program Committee*, **19th International Conference on Noise and Fluctuations (ICNF 2007)**, Tokyo, Japan (9-14 November 2007).
- Co-Organizer, *Organic and Polymeric Semiconductor Devices*, **212th Meeting of the Electrochemical Society**, Washington, DC (7-12 October 2007).
- Member, *Program Committee*, **SPIE Conference on Noise and Fluctuations in Circuits, Devices and Materials**, Florence, Italy (20-24 May 2007).
- Co-Organizer, *Silicon Nitride and Silicon Dioxide Thin Insulating Films and Other Emerging Dielectrics IX*, **211th Meeting of the Electrochemical Society**, Chicago, Illinois (6-11 May 2007).
- Co-Organizer, *Sensors Based on Nanotechnology 3*, **211th Meeting of the Electrochemical Society**, Chicago, Illinois (6-11 May 2007).
- Member, *Organizing Committee*, **IEEE International Conference on RFID 2007**, Grapevine, Texas (26-28 March 2007).
- Member, *Program Committee*, **Polytronic 2007 – The 6th International IEEE Conference on Polymers and Adhesives in Microelectronics and Photonics**, Miraikan - Odaiba, Tokyo, Japan (16-18 January 2007).
- Member, *International Advisory Committee*, **IEEE/SPIE International Conference on Computers and Devices for Communications** (CODEC), Calcutta, India (18-20 December 2006).
- Member, *Programme Committee*, **European Nano Systems 2006**, Paris, France (14-15 December 2006).
- Member, *International Programme Committee*, **The Fourth IASTED International Conference on Circuits, Signals, and Systems**, San Francisco, California, (20-22 November 2006).
- Co-Organizer, *Bioelectronics, Biointerfaces, and Biomedical Applications 2*, **210th Meeting of the Electrochemical Society**, Cancun, Mexico (29 October – 3 November 2006).
- Co-Organizer, *Third International Symposium on Integrated Optoelectronics*, **210th Meeting of the Electrochemical Society**, Cancun, Mexico (29 October – 3 November 2006).
- Member, *Technical Program Committee*, **8th International Conference on Solid-State and Integrated-Circuit Technology** (ICSICT 2006), Shanghai, China (23-26 October 2006).
- Co-Organizer, *Solid-State Joint General Poster Session*, **The 209th Meeting of the Electrochemical Society**, Denver, Colorado (7-12 May 2006).
- Co-Organizer, *New Sensor Materials*, **The 209th Meeting of the Electrochemical Society**, Denver, Colorado (7-12 May 2006).
- Vice-Chair, *Circuits*, **Sixth IEEE International Caracas Conference on Devices, Circuits and Systems (ICCDs-2006)**, Mexico (26-28 April 2006).
- Member, Programme Committee, **European Nano Systems 2005**, Paris, France (14-16 December 2005).
- Co-Organizer, *Dielectrics and the Dielectric-Electrolyte Interface in Biological and Biomedical Applications*, **The 208th Meeting of the Electrochemical Society**, Los Angeles, California (17-21 October 2005).
- Member, Scientific Program Committee, **18th International Conference on Noise and Fluctuations (ICNF2005)**, Salamanca, Spain (19-23 September 2005).
- Member, *Program Committee*, **12th Canadian Semiconductor Technology Conf.**, Ottawa (August 2005).
- Member, International Scientific Committee, **4th International Conference on Unsolved Problems of Noise and Fluctuations in Physics, Biology & High Technology**, Gallipoli (Lecce), Italy (6-9 June, 2005)
- Co-Chair, **SPIE Conf. on Noise in Devices and Circuits**, Austin, Texas (May 2005).
- Co-Organizer, *Silicon Nitride and Silicon Dioxide Thin Insulating Films and Other Emerging Dielectrics VIII*, **207th Meeting of the Electrochemical Society**, Quebec City, Quebec (15-20 May 2005).

- Member, *Technical Program Committee – Solid State Devices, IEEE International Electron Devices Meeting* (2003-05).

Publications in Last two years (2005 to present)

Edited Books or Conference Proceedings

1. **Silicon Nitride, Silicon Dioxide and Emerging Dielectrics 9 (Ninth International Symposium)**, Eds., R. E. Sah, M. J. Deen, J.F. Zhang, Y. Yota, and Y. Kamakura, The Electrochemical Society, Proceedings Series, Pennington, N.J., ECS Transactions Vol. 6, No. 3, 847 pages (2007).
2. **Noise in Devices and Circuits III**, Eds., A. Balandin, F. Danneville, M.J. Deen and D.M. Fleetwood, SPIE Proceedings Series Vol. 5844, Bellingham, Washington (2005).
3. **Silicon Nitride and Silicon Dioxide Thin Insulating Films and Other Emerging Dielectrics (Eight International Symposium)**, Eds., R. E. Sah, M. J. Deen, J. Zhang, Y. Yota, and Y. Kamakura, The Electrochemical Society, Proceedings Series, Pennington, N.J., PV2005-01, 588 pages (2005).

Book Chapter

1. **Invited Contribution**, M. Jamal Deen and Fabien Pascal, *Electrical Characterization of Semiconductor Materials and Devices*, in **Springer Handbook of Electronic and Optoelectronic Materials**, Eds. Safa Kasap and Peter Capper, Springer Science and Business Media Inc., New York, pp. 409-438, (2006).

Invited Journal Papers (2005 to present)

1. **Invited Review Paper**, M. Waleed Shinwari, M. Jamal Deen and Dolf Landheer, *Study of the Electrolyte-Insulator-Semiconductor Field-Effect Transistor (EISFET) with Applications in Biosensor Design*, **Microelectronics Reliability**, 33 journal pages, In Press (Accepted October 2006).
2. **Invited Paper**, Juan C. Ranuarez, M. Jamal Deen and Chih-Hung Chen, *A Review of Gate Tunneling Current in MOS Devices*, **Microelectronics Reliability**, Vol. 46(12), pp. 1939-1956 (December 2006).
3. **Invited Paper**, B. Iñiguez, T.A. Fjeldly, A. Lázaro, F. Danneville and M.J. Deen, *Compact Modeling Solutions For Nanoscale Double-Gate and Gate-All-Around MOSFETs*, **IEEE Trans. on Electron Devices (Special Issue on Advanced Compact Models and 45-nm Modeling Challenges)**, Vol. 53(9), pp. 2128-2142 (September 2006).
4. **Invited Paper**, M.J. Deen, C.-H. Chen, S.. Asgaran, G. A. Rezvani, J. Tao and Y. Kiyota, *High Frequency Noise of Modern MOSFETs: Compact Modeling and Measurement Issues*, **IEEE Trans. on Electron Devices (Special Issue on Advanced Compact Models and 45-nm Modeling Challenges)**, Vol. 53(9), pp. 2062-2081 (September 2006).
5. **Invited Paper**, M.J. Deen, B. Iniguez, O. Marinov. F. Lime, *Electrical Studies of Semiconductor-Dielectric Interfaces*, **Special Issue - Journal of Materials Science: Materials in Electronics**, Vol. 17(9), pp. 663-683 (September 2006).
6. **Invited Review Paper**, M. Jamal Deen and Fabien Pascal, *Electrical Characterization of Semiconductor Materials and Devices*, **Journal of Materials Science: Materials in Electronics**, Vol. 17(8), pp. 549-575 (August 2006).
7. **Invited Paper**, S. Naseh, M.J. Deen, C-H. Chen, *Hot-carrier Reliability of Submicron NMOSFETs and Integrated NMOS Low Noise Amplifiers*, **Microelectronics Reliability**, Vol. 46(2-4), pp. 201-212 (Feb.-April 2006).
8. **Invited Paper**, M. Jamal Deen, Rizwan Murji, Ahmed Fakhr, Nabeel Jafferli and Wai Leung Ngan, *Low Power CMOS Integrated Circuits for Radio Frequency Applications*, **IEE Proceedings - Circuits, Devices and Systems**, Vol. 152(5), pp. 509-522 (October 2005).
9. **Invited Paper**, A. Jiménez-P, F.J. De la Hidalga-W, and M.J. Deen, *Modelling of the Dynamic Threshold MOSFET*, **IEE Proceedings - Circuits, Devices and Systems**, Vol. 152(5), pp. 502-508 (October 2005).
10. **Invited Paper**, M. Jamal Deen and Mehdi H. Kazemeini, *Photosensitive Polymer Thin-Film Field-Effect Transistors Based on Poly(3-octylthiophene)*, **Proceedings of the IEEE (Special Issue on Flexible Electronics Technology - Part 1: Systems and Applications)**, Vol. 93(7), pp. 1312-1320 (July 2005).
11. **Invited Paper**, Y. Cheng, M.J. Deen and C-H. Cheng, *MOSFET Modeling for RFIC Design*, **IEEE Trans. on Electron Devices (Special Issue on IC Technologies for RF Circuit Applications)**, Vol. 52(7), pp. 1286-1303 (July 2005).

Journal Papers (2005 to present)

12. Dolf Landheer, W. Ross McKinnon, Geof Aers, Weihong Jiang, M. Jamal Deen and M. Waleed Shinwari, *Calculation of the Response of Field-Effect Transistors to Charged Biological Molecules*, **IEEE Sensors Journal**, 9 pages, In Press (accepted February 2007).
13. Hamed M. Jafari, M. Jamal Deen, Steve Hranilovic and Natalia K. Nikolova, *A Study of Ultra-Wideband Antennas for Near-Field Imaging*, **IEEE Transactions on Antennas and Propagation**, In Press, 6 pages (accepted 2 January 2007).

14. S. Asgaran, M.J. Deen, C.H. Chen, G. A. Rezvani, Y. Kamali and Y. Kiyota, *Analytical Extraction of MOSFET's High Frequency Noise Parameters from NF_{50} Measurements and its Application in RFIC Design*, **IEEE Journal of Solid-State Circuits**, Vol. 42(5) 10 pages, (May 2007).
15. O. Marinov, M.J. Deen and J.A. Jiménez Tejada, *Theory and Physical Explanation of the Microplasma Fluctuation and Noise in Avalanche Breakdown of the Silicon Diodes*, **Journal of Applied Physics**, Vol. 101, #064515, 21 pages (15 March 2007).
16. Saman Asgaran, M. Jamal Deen, and Chih-Hung Chen, *Design of the Input Matching Network of RF CMOS LNAs for Low-Power Operation*, **IEEE Transactions on Circuits and Systems I**, Vol. 54(3), pp. 544-554 (March 2007).
17. F. Mohammady, Z.L. Peng, D. A. Thompson and M. J. Deen, *Reactive Ion Etching of GaSb with an Electron Cyclotron Resonance Source using Methane/Hydrogen chemistry in an Argon Plasma*, **Journal of the Electrochemical Society**, Vol. 154(2), pp. H127-H130 (2007).
18. M. A. Naser, M.J. Deen and D. A. Thompson, *Spectral Function of InAs/InGaAs Quantum Dots in a Well Detector Using Green's Function*, **Journal of Applied Physics**, Vol. 100, #093102, 6 pages (1 November 2006).
19. J.A. Jiménez Tejada, P. Lara Ballejos, J.A. López Villanueva, F. M. Gómez-Campos, S. Rodríguez-Bolívar and M. Jamal Deen, *Determination of the Concentration of Recombination Centers in Thin Asymmetrical p-n Junctions from Capacitance Transient Spectroscopy*, **Applied Physics Letters**, Vol. 89, #112107, 3 pages (September 2006)].
20. M.J. Deen, M.W. Shinwari, J.C. Ranuárez and D. Landheer, *Noise Considerations in Field-Effect Biosensors*, **Journal of Applied Physics**, Vol. 100, #074703, 8 pages (1 October 2006).
21. N. Faramarzpour, M.J. Deen and S. Shirani, *An Approach to Improve the Signal-to-Noise Ratio of Active Pixel Sensor for Low-Light-Level Applications*, **IEEE Trans. on Electron Devices**, Vol. 53(9), pp. 2384-2391 (September 2006).
22. O. Marinov, M. J. Deen and B. Iniguez, *Performance of Organic Thin-Film Transistors*, **Journal of Vacuum Science and Technology B**, Vol B24(4), pp. 1728-1733. (July/August 2006).
23. N. Faramarzpour, M.J. Deen, and S. Shirani, *Signal and Noise Modelling and Analysis of CMOS Active Pixel Sensors*, **Journal of Vacuum Sci. and Tech. A (Special Issue for CSTC 2005)**, Vol. 24(3), pp. 879–882 (May/June 2006).
24. Y. Ardeshirpour, M.J. Deen and S. Shirani, *Evaluation of CMOS Based Photodetectors for Low-level Light Detection*, **Journal of Vacuum Science and Tech. A (Special Issue for CSTC 2005)**, Vol A24(3), pp. 860–865 (May/June 2006).
25. S.M. Abdelsayed, M.J. Deen and N. K. Nikolova, *Parasitic-aware Layout Design of a Low-power Fully Integrated Complementary Metal-Oxide Semiconductor Power Amplifier*, **Journal of Vacuum Science and Technology A (Special Issue for CSTC 2005)**, Vol A24(3), pp. 835–840 (May/June 2006).
26. J.C. Ranuárez, M.J. Deen and C.H. Chen, *Temperature Effects in CMOS Microwave Distributed Amplifiers*, **Journal of Vacuum Science and Technology A (Special Issue for CSTC 2005)**, Vol A24(3), pp. 831–834, (May 2006).
27. M.J. Deen, S. Naseh, O. Marinov, M.H. Kazemeini, *Very Low-Voltage Operation Capability of CMOS Ring Oscillators and Logic Gates*, **Jour. Vacuum Sci. & Tech. A (Special Issue)**, Vol. 24(3), pp. 763–769 (May/June 2006).
28. H. M. Jafari, W. Liu, S. Hranilovic and M. J. Deen, *Ultra-Wideband (UWB) Radar Imaging System for Biomedical Applications*, **Jour. Vacuum Sci. & Tech. A (Special Issue)**, Vol A24(3), pp. 752–757, (May/June 2006).
29. O. Marinov and M. J. Deen, B. Iniguez and B. Ong, *Charge Localization in Polymeric Metal-Oxide-Semiconductor Capacitors*, **Jour. Vacuum Sci. & Tech. A (Special Issue for CSTC 2005)**, Vol A24(3), pp. 649–653 (May/June 2006).
30. F.M. Mohammady, O. Hulko, B.J. Robinson, D.A. Thompson, M.J. Deen, J.G. Simmons, *Growth and Characterization of GaAsSb Metamorphic Samples on an InP-Substrate*, **Journal of Vacuum Science and Technology A (Special Issue for Canadian Semiconductor Technology Conference - CSTC 2005)**, Vol A24(3), pp. 587–590 (May/June 2006).
31. S. Asgaran, M.J. Deen and C.-H. Chen, *A 4 mW Monolithic CMOS LNA at 5.7 GHz with the Gate Resistance Used for Input Matching*, **IEEE Microwave and Wireless Components Letters**, Vol. 16(4), pp. 1880-190 (April 2006).
32. S. Soliveres, A. Hoffmann, F. Pascal, C. Delseny, M.S. Kabir, O. Nur, A. Salasse, M. Wilander and M.J. Deen, *Excess Low Frequency Noise in Single-wall Carbon Nanotube*, **Fluctuation and Noise Letters**, Vol. 6(1), pp. L45-L55 (2006).
33. Guennadi A. Kouzaev, M. Jamal Deen, Natalia K. Nikolova and Ali H. Rahal, *Cavity Models of Planar Components Grounded by Via-holes and their Experimental Verification*, **IEEE Transactions on Microwave Theory and Techniques**, Vol. 54(3), pp. 1033-1042 (March 2006).
34. S. Naseh, M.J. Deen and C.-H. Chen, *Effects of Hot-Carrier Stress on the Performance of CMOS Low Noise Amplifiers*, **IEEE Transactions on Device and Materials Reliability**, Vol. 5(3), pp. 501-508 (September 2005).
35. D. Landheer, G. Aers, W.R. McKinnon, M.J. Deen and J.C. Ranuarez, *Model for the Field-Effect from Layers of Biological Macromolecules on the Gates of Metal-Oxide-Semiconductor Transistors*, **Journal of Applied Physics**, Vol. 98, # 044701, 15 pages (15 August 2005).

36. Ni Zhao, Ognian Marinov, Gianluigi A. Botton, M. Jamal Deen, B.S. Ong, Y. Wu, P. Liu, *Characterization of MOS Structures Based on Poly (3,3'''-dialkyl-quatertiophene)*, **IEEE Transactions on Electron Devices**, Vol. 52(10), pp. 2150-2156 (October 2005).
37. Juan C. Ranuárez, M. Jamal Deen and Chih-Hung Chen, *Modeling the Partition of Noise from the Gate Tunneling Current in MOSFETs*, **IEEE Electron Device Letters**, Vol. 26(8), pp. 550-552 (August 2005).
38. R. Murji and M.J. Deen, *Accurate Modelling and Parameter Extraction for Meander-Line N-well Resistors*, **IEEE Transactions on Electron Devices (Special Issue on Integrated Circuit Technologies for RF Circuit Applications)**, Vol. 52(7), pp. 1364-1369 (July 2005).
39. O. Marinov, M. Jamal Deen, Benjamin Iniguez, *Charge Transport in Organic and Polymer Thin-Film Transistors: Recent Issues*, **IEE Proceedings - Circuits, Devices and Systems**, Vol. 153(3), pp. 189-209 (June 2005).
40. N.R. Das and M.J. Deen, *A Model for the Performance Analysis and Design of Waveguide PIN Photodetectors*, **IEEE Transactions on Electron Devices**, Volume 52(4), pp. 465-472 (April 2005).
41. Y.M. El-Batawy and M.J. Deen, *Analysis and Circuit Modeling of Waveguide-Separated Absorption Charge Multiplication-Avalanche Photodetector*, **IEEE Trans. on Electron Devices**, Vol. 52(3), pp. 335-344 (March 2005).
42. G.A. Kouzaev, M.J. Deen, N.K. Nikolova and A. Rahal, *An Approximate Parallel-plate Waveguide Model of a Lossy Multilayered Microstrip Line*, **Microwave and Optical Technology Letters**, Vol. 45(1), pp. 23-26 (5 April 2005).
43. Y.M. El-Batawy and M. J. Deen, *Effects of the Parasitics on the Time Response of Resonant Cavity Enhanced Photodetectors (RCE-PDs)*, **IEEE Transactions on Electron Devices**, Vol. 52(3), pp. 325-334 (March 2005).
44. G.A. Kouzaev, M.J. Deen and N.K. Nikolova, *A Parallel-Plate Waveguide Model of Lossy Microstrip Lines*, **IEEE Microwave and Wireless Components Letters**, Vol. 15(1), pp. 27-29 (January 2005).
45. Y.M. El-Batawy and M.J. Deen, *Analysis, Circuit Modeling and Optimization of Mushroom Waveguide Photodetector (Mushroom-WGPD)*, **IEEE Journal of Lightwave Technology**, Vol. 23(1), pp. 423-431 (January 2005).

Plenary, Keynote or Invited Conference Papers (2005 to present)

46. **Invited Paper**, M. J. Deen, M.W. Shinwari and D. Landheer, *Noise Characteristics in Integrated Biosensing Devices*, **19th International Conference on Noise and Fluctuations**, Tokyo, Japan, 6 pages, (9-14 September 2007).
47. **Invited Paper**, F. Pascal, J. Raoult, C. Delseny, P. Benoit, M. Marin and M.J. Deen, *Impact of Technological Parameters on the Low Frequency Noise of Advanced Heterojunction Bipolar Transistors*, **19th International Conference on Noise and Fluctuations**, Tokyo, Japan, 6 pages, (9-14 September 2007).
48. **Keynote Paper**, M. Jamal Deen, Munir M. El-Desouki, Hamed M. Jafari and Saman Asgaran, *Low-Power Integrated CMOS RF Transceiver Circuits for Short-Range Applications*, **50th IEEE International Midwest Symposium on Circuits and Systems (MWSCAS 2007) and 5th IEEE International Northeast Workshop on Circuits and Systems (NEWCAS 2007)**, Montreal, Canada, 6 pages (5-8 August 2007).
49. **Invited Paper**, M. Jamal Deen and M.W. Shinwari, *Modeling the Electrical Characteristics of FET-type Sensors for Biomedical Applications*, **Workshop on Compact Modeling**, Santa Clara, CA, 4 pages (20-24 May 2007).
50. **Keynote Paper**, M.J. Deen, M. Waleed Shinwari, Dolf Landheer and Gregory Lopinski, *High Sensitivity Detection of Biological Species via the Field-Effect*, **Proceedings of the IEEE International Caribbean Conference on Devices, Circuits and Systems**, Playa del Carmen, Quintana Roo, Mexico, pp. 381-385 (26-28 April 2006).
51. **Plenary Paper**, M. Jamal Deen and O. Marinov, *Noise in Advanced Electronic Devices and Circuits*, **18th Int. Conf. on Noise in Physical Systems and 1/f Fluctuations (ICNF 2005)**, Salamanca, Spain, 19-23 September 2005, **AIP Conf. Proceedings**, Vol. 780, Eds. T. Gonzalez, J. Mateos and D. Pardo, Melville, New York, pp. 3-12 (2005).
52. **Invited Paper**, M. Jamal Deen and Rizwan Murji, *Integrated Circuits for Low Power Transceiver Applications in CMOS*, **IEEE 2005 Int. NE Workshop Circ. & Sys. (NEWCAS)**, Quebec City, pp. 256-259 (June 19-22, 2005).
53. **Invited Paper**, M. Jamal Deen, J. C. Ranuárez and C.-H. Chen, *Effect of the Gate Tunneling Current on the High-Frequency Noise of MOSFETs*, **Workshop on Compact Modeling**, Anaheim, CA, pp. 35-39 (8-12 May 2005).
54. **Plenary Paper**, M. Jamal Deen, *Plastic Microelectronics with Organic and Polymeric Thin Film Transistors*, **IEEE Conferencia De Dispositivos Electronicos**, Tarragona, Spain, (CDE05-102), 4 pages (3-5 February 2005).

Contributed Conference Papers (2005 to present)

55. M. J. Deen, O. Marinov and Y. Kiyota, *Low-Frequency Noise in RF nMOS Transistors from a 70 nm CMOS Technology*, **19th International Conference on Noise and Fluctuations**, Tokyo, Japan, 4 pages, (9-14 September 2007).
56. Y. Kiyota, C - H. Chen, T. Kubodera, A. Nakamura, K. Fukushima, K. Takeshita, and M. J. Deen, *A New Approach of High Frequency Noise Modeling for 70-nm NMOS by Accurate Noise Source Extraction*, **IEEE Radio Frequency Integrated Circuits Symposium (RFIC-2007)**, Honolulu, Hawaii, 4 pages (3-8 June 2007).

57. W. H. Jiang, D. Landheer, G. Lopinski, A. Rankin, N. G. Tarr, and M. J. Deen, *Post-processing of Commercial CMOS Chips for the Fabrication of DNA Bio-FET Sensor Arrays*, **Proceedings of the Materials Research Society Symposium - Fall Meeting**, Boston, Mass., Vol. xxx, 6 pages (27 November – 1 December 2006).
58. Samar M. Abdelsayed, Natalia K. Nikolova M. Jamal Deen, *Radiation Characteristics of Loop Antennas for Biomedical Implants*, **Proceedings of the XXVII General Assembly of the International Union of Radio Science (URSI) General Assembly**, New Delhi, India, 4 pages (23 - 29 October 2005).
59. H.M. Jafari, M.J. Deen, S. Hranilovic and N. K. Nikolova, *Slot Antenna for Ultra-wideband Applications*, **IEEE International Symposium of the Antennas and Propagation Society**, pp. 1107-1110 (9-14 July 2006).
60. S. Asgaran, M.J. Deen and C-H. Chen, *An Analytical Method to Determine MOSFET's High Frequency Noise Parameters from 50 Ohm Noise Figure Measurements*, **IEEE Radio Frequency Integrated Circuits Symposium (RFIC-2006)**, San Francisco, California, pp. 341-345 (11-13 June, 2006).
61. Samar M. Abdelsayed, M. Jamal Deen and Natalia K. Nikolova, *A Fully Integrated Low-Power CMOS Power Amplifier for Biomedical Applications*, **European Conference on Wireless Technology**, Paris France, pp. 1715-1718 (3-4 October 2005).
62. Munir M. El-Desouki, M. Jamal Deen and Yaser M. Haddara, *A Low-Power CMOS Class-E Power Amplifier for Biotelemetry Applications*, **35th European Microwave Conference**, Paris, France, pp. 441-444 (6-8 October 2005).
63. S. Soliveres, A. Hoffmann, F. Pascal, C. Delseny, A. Salasse, M.S. Kabir, S. Bengtsson, O. Nur, M. Wilander and M. J. Deen, *Low-Frequency Noise in Contacted Single-Wall Carbon nanotube*, **Proc. of the 18th Int. Conf. on Noise in Physical Systems and 1/f Fluctuations (ICNF 2005)**, Salamanca, Spain, pp. 462-265 (19-23 September 2005).
64. Rizwan Murji and M. Jamal Deen, *Noise Contributors in a Low Power VCO with Automatic Amplitude Control*, **IEEE Radio-Frequency Integrated Circuits Symposium**, Long Beach, CA, USA, pp. 407-410 (June 12-14, 2005).
65. Rizwan Murji and M. Jamal Deen, *Design Issues of a Low Power Wideband Frequency Doubler Implementation in 0.18 μm CMOS*, **2005 IEEE Int. Sym. on Circuits and Systems**, Kobe, Japan, pp. 4353-4356 (May 23-26, 2005).



May 2, 2006

The iNEER Awards Committee

Re: Nomination of M. Jamal Deen, Ph.D., for the iNEER Achievement Award

Dear Achievement Award Committee Members:

I strongly support, without any reservation whatsoever, the nomination of Dr. M. Jamal Deen for the iNEER Achievement Award based on his outstanding academic career in the fields of research and education

I have had the pleasure of knowing Dr. Deen for over 10 years, in both the academic and personal aspects. As a researcher, there is no doubt that Dr. Deen is worldwide recognized as an international leader in various fields of electrical engineering. My personal interaction with him has been focused on the physics, modeling and characterization of semiconductor devices for high-frequency applications, from wireless communication systems to optoelectronic devices. The insight I have gained from Dr. Deen's knowledge and experience has been fundamental to my own professional development, as well as that of my students and others at INAOE.

It is evident that many colleagues worldwide share my high opinion of his research accomplishments; he has been elected to the highest grade of Fellow in four technical societies - the IEEE, the AAAS, the ECS and the EIC. He currently is editor of many prestigious scientific journals and international conference proceedings. Moreover, he has been distinguished as a Visiting Scholar in several research institutions. His impeccable research credentials are already documented in the award nomination material, so there is no need to repeat it in my letter.

In the academic field, Dr. Deen has collaborated intensively with our Institute, serving as an External Jury in our Doctoral Program on many occasions and in providing input and guidance on our research work and educational program. The dedication and professionalism that Dr. Deen has shown when reviewing the students' dissertations has helped them to considerably improve their work, thus better preparing them for careers in research and education. Dr. Deen has also hosted students and professors from INAOE who have returned to improve the quality of research and education here. Through his dedication and keen involvement, new bridges for educational and research partnerships have been established between his university and INAOE. Some specific examples are his active promotion of research opportunities and collaborations in niche areas such as amorphous semiconductor systems, high-frequency electronics, organic/polymeric electronics and sensing systems between our institutions. In a recent commencement speech at the graduating ceremonies at INAOE, he spoke passionately about the importance of "soft (communication and team skills)" and "hard (academic)" skills as part of the education of engineers and scientists in these countries. Dr. Deen's sustained involvement and generous donation of his time as a Member of the Technical Program Committee and Vice-chair in the IEEE International Caribbean Conference on Devices, Circuits and Systems (ICDCS) for the last 8 years (I was the general Chair for the 6th Conference in 2006) has helped to improve the quality of the conference as well as to attract world-class researchers to it. These examples amply demonstrate his "innovations and exemplary, sustained, superior accomplishments in promoting international cooperation in engineering

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education" that not only benefit INAOE, but also other institutions in Mexico and the Caribbean basin.

I have had the great pleasure to attend a great number of presentations by Dr. Deen in international conferences, many as a Keynote Speaker, from which it is clearly evident that he not only has the knowledge and expertise, but also the ability to confer and explain it to large audiences.

Finally, the human aspect can not be left out of a successful career, and Dr. Deen has amply demonstrated that his human quality is well above average. He has always been willing to help develop research groups, to form better human relations, and to foster the advancement of science and education in all possible aspects.

Based on all of the above, I extend my highest recommendation that Dr. M. Jamal Deen be awarded the INEER Achievement Award. I sincerely hope that the Awards Committee concurs.

Sincerely:

Roberto S. Murphy Arteaga, Ph.D.
Academic Dean – INAOE
Senior Researcher – Electronics Department INAOE
Senior Member IEEE
Member of the Mexican Academy of Sciences (AMC)
Member of the Mexican National System of Researchers (SNI)

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Dr. Nikhil R. Das, *M.Tech., Ph.D. (Tech.), FIETE, SMIEE*

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July 4, 2007

The iNEER Awards Committee
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Ref: Dr. M. Jamal Deen's nomination for iNEER Achievement Award

Dear Award Committee Members:

It is my great pleasure and honor to support the nomination of Professor M. Jamal Deen, in the strongest terms, for the iNEER Achievement Award *“for pioneering contributions and leadership in research and in international education and research collaborations”*.

I have known Dr. Deen for more than ten (10) years in various capacities. Firstly, I have known him through his quality research publications, and later personally, when I had an opportunity to work with him as a Researcher during 1999-2002 and then as a research collaborator including my Visiting Professorship in 2005. So, I have followed closely his research work, demonstrated ability and enthusiastic involvement in promoting international cooperation in engineering education. Dr. Deen has generously given of his time to improve the quality of research and education and also to promote international conferences in developing countries/regions. He has been a superb host and mentor of students and faculty members from various countries, e.g. India, China, Mexico, Egypt, Iran, Taiwan, Bulgaria, etc. Their long association and direct interaction with Dr. Deen have helped them to boost the standard of research and education at their home institutions. During his visit to many of these countries, he deliberately allocated some of his times to actively interact with students and researchers in order to promote academic excellence as well as communication skills and good team work, as part of the education of engineers and scientists in these countries. I can provide a few specific examples. Firstly, during his trip to India in 2000 and in 2003, when he visited our Institute at the University of Calcutta, he delivered talks in the frontier areas of silicon technology and explained students how to improve the skills before they enter into the professional world. Our students benefited significantly from his inspiring speech, active discussions with him and his useful guidance for some the keys to success in this modern world of rapid advancement. On another occasion when I myself accompanied him during his visit to Engineering Institute in Bangkok, Thailand in 2000, I have seen how he motivated the students and young faculties of that Institute for the development of engineering research and technology development.

He has served a lot for the globalization of knowledge through his active help in organizing international conferences in different countries. I know that he has served for the IEEE International Caribbean Conference on Devices, Circuits and Systems (ICDCS) for many years. Besides, he has been providing tremendous help and co-operation to successfully organize the International Conference on Computer and Devices for Communication (CODEC) organized by the Institute of Radio Physics and Electronics, University of Calcutta, in India for the past 4 years. In particular, it was because of his active and

generous help and invaluable suggestions, the CODEC was held so successfully in 2004, when he was the Chairman of the International Advisory Committee and I myself was the Convener / Secretary of that conference, and again in 2006. He has established strong educational and research collaborations with institutions in India (e.g. University of Calcutta), Mexico, Brazil, France, Egypt, Iran, etc. The strong collaboration with many of those countries still exists in full-force. He is playing a major role in promoting nanotechnology research and education with us (my colleagues and me) at the University of Calcutta, India.

As a research scholar, Dr. Deen has an exemplary track-record. He has published a large number of research contributions in top-level international journals, delivered many Plenary, Keynote and Invited talks. He is the Editor of various international journals including the highly rated IEEE Transactions on Electron Devices, and has been the reviewer of quite a large number of journals. He has edited books and contributed many book chapters. The nominee's curriculum vita clearly indicates various aspects of his involvement as a scientist and researcher, and of his contribution at the international level. This space is too small to enlist that enormous information.

He has made some outstanding contributions in the field of microelectronics and optoelectronics. His expertise in both theoretical and practical engineering work is highly commendable and his research contributions have significant impact in engineering applications. He is known internationally for his work on the studies of noise in semiconductor devices and is the pioneering contributor on investigating high-frequency noise in silicon transistors which play key roles in modern wireless portable and personal communication systems. He has broad spectrum of research interest. For, example, he has made equally significant contributions in the design and modeling of photodetectors for optical communication.

He has visited a large number of countries to attend conferences/symposia, has visited Institutes in developing countries to impart knowledge and guidance to promote research, and is known by a large number of personnel in academia and industry. I have seen him working very hard to prepare the most relevant and up-to-date material when attending conferences and workshops in developing countries so the attendees can benefit for his experience. His dedication in promoting research among the people in various countries is really unique. He has established himself as a sought-after research specialist in the International scenario. He can visualize the upcoming events in the engineering fields and thus his advice becomes fruitful and beneficial to the trainee.

In conclusion, because of his pioneering contributions and illustrious leadership in research, and tireless effort in international education and research collaborations, I support in the strongest possible terms, the nomination of Dr. Deen for the *Achievement Award*.

Sincerely,



N. R Das, *M.Tech., Ph.D. (Tech.), FIETE, SMIEE*

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