

**M. Jamal Deen PhD Dr-hc Dr-hc Dr-hc DEng-hc**

**FRSC FCAE FNASI FINAE MEASA FIEEE FAPS FECS FAAAS FEIC**

***President, Academy of Science, Royal Society of Canada (2015-17)***

**Distinguished University Professor – McMaster University**

**Canada Research Chair in Information Technology; Director, Micro- & Nano-Systems Lab.**

Electrical and Computer Engineering, McMaster University, 1280 Main St. West, Hamilton, ON L8S 4K1, CANADA

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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**

Distinguished Univ. Prof.	2015-present	Elect. & Computer Engineering	McMaster University, Hamilton, Ontario.
Canada Research Chair	2001 - present	Elect. & Computer Engineering	McMaster University, Hamilton, Ontario.
Professor	1999 - present	Elect. & Computer Engineering	McMaster University, Hamilton, Ontario.
Dist. Visiting Prof.	2008-2013	Division of ITCE, WCU Program	POSTECH, Pohang, South Korea.
Guest Professor	Jan - July 2008	Fachgebiet Mikrowellentechnik	Technische Universitaet Berlin, Germany.
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, USA.

## **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, Canada.
Visiting Scientist	1992-1993	Device Technology (P813)	Northern Telecom Ltd., Ottawa, Canada.
Visiting Scientist	Summer 1986	Herzberg Inst. of Astrophysics	National Research Council, Ottawa, Canada.

## **AWARDS/HONORS**

### **Honorary Degrees & Fellowships/Membership in National Academies or Societies**

Doctor - Honoris Causa	El Instituto Nacional de Astrofísica, Óptica y Electrónica, Puebla, Mexico, 11 Nov 16.
Doctor - Honoris Causa	Universitat Rovira I Virgili, Tarragona, Spain, 7 March 2014.
Doctor - Honoris Causa	Universidad de Granada, Granada, Spain, 25 May 2012.
Doctor of Engineering - Honoris Causa	University of Waterloo, Waterloo, Ontario, Canada, 18 June 2011.
Member (Academician)	European Academy of Sciences and Arts, 10 July 2014.
Fellow (Foreign)	NASI, The National Academy of Sciences, India, October 2012.
Fellow (Foreign)	INAE, The Indian National Academy of Engineering, September 2007.
Fellow	CAE, The Canadian Academy of Engineering, April 2007.
Fellow	RSC, The Royal Society of Canada - The Academies of Arts, Humanities & Sciences of Canada, 2006 – <b>Highest honor for scholars, artists &amp; scientists in Canada.</b>
Fellow	APS, The American Physical Society, November 2008.
Fellow	AAAS, The American Assoc. 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	WIF, The World Innovation Foundation May 2006 – <b>Highest honor from WIF.</b>

### International and National Awards and Honors

PIFI Distinguished Scientist Award	Chinese Academy of Sciences, Beijing, 2017.
Overseas Academic Masters Scholar Award	Dalian University of Technology, Dalian, China, 2017.
Ham Outstanding Engineering Educator Award	IEEE Canada, 5 May 2014.
Vice-Chancellor's Award	The University of the West Indies, 11 May 2013.
AGL McNaughton Gold Medal	IEEE Canada, 6 May 2013 – <b>Top Award for Engineers.</b>
Fessenden Silver Medal	IEEE Canada, 9 May 2011.
Electronics and Photonics Division Award	Electrochemical Society, 1 May 2011.
Science and Technology Award	New Pioneers Awards, Toronto, Canada, 25 February 2010.
Eadie Medal	The Royal Society of Canada, July 2008 – <b>Only Engineering Award.</b>
Technology Achievement Award	ICCC – Indo-Canada Chamber of Commerce, June 2009.
Guyana Award – Academic Excellence	Guyana Awards Council - Canada, May 2008.
Humboldt Research Award	Alexander von Humboldt Foundation, April 2006.
IBM Faculty Award	IBM Corporation, USA, 2006.
Distinguished Lecturer	IEEE - Electron Device Society, 2002 - present.
Thomas D. Callinan Award	Electrochemical Soc. – Dielectric Science & Technology Div., 2002.
Canada Research Chair	Government of Canada, 2001 - 2022.

### Scholastic Awards

PIFI Distinguished Scientist Award	Chinese Academy of Sciences, Beijing, 2017.
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 Univ. of Guyana (1978).
Chancellor's Medal	Second best graduating student of the University of Guyana (1978).

### Other Competitive Awards for Research and Service

Distinguished Visiting Professor	Huazhong Univ. Science & Technology, Wuhan, China, April-May 2016.
Honorary Professor	Shanghai University, 2015-2018.
Càtedres d'Excellència	Universitat Rovira I Virgili (URV), Tarragona, Spain, Feb-March 2016.
Guest Professor	Jiang Nan University, Wuxi, China, 2014-2016.
Winegard Lecturer	University of Guelph, 10 May 2013.
Engineering Research Award	McMaster University, 8 May 2013.
Royal Society of Canada Keynote Lecturer	Canadian Congress of Applied Mechanics – CANCAM, 6 June 2011.
Càtedres d'Excellència	Universitat Rovira I Virgili (URV), Tarragona, Spain, Jan-March 2011.
Bao Yu-gang Chair Professorship	Zhejiang University, Zhejiang, China, August 2009 – for 6 years.
NSERC Senior Industrial Fellow	Device Technology (P813), Northern Telecom, Ottawa, 1993.
Listed in	Canadian Who's Who, from '07, Academic Keys Who's Who in Higher Educ. Eng., from '06. & Amer Men & Women of Sc, from Feb 1989.
Distinguished Researcher Award	Province of Ontario, July 2001.
IEEE Outstanding Branch Counselor and Advisor Award for Canada - Region 7, April 1994.	
IEEE Exemplary Student Branch Award for SFU (Deen - Counselor and Kwan - Student Chair) - Region 7, 1995.	

### Best Papers/Posters/Presentation Awards

17 Best Paper/Poster/Presentation awards from IEEE, IET etc. Conferences, Symposia and Workshops (2004-2016)

### EDITORIAL RESPONSIBILITIES - Current

- Co-Editor-in-Chief, *Micro and Nanosystems* (2016 – present).
- Co-Editor-in-Chief, *International Journal of High Speed Electronics and Systems* (2014 – present).
- Member, Editorial Board, *Micro and Nanosystems* (January 2012 – present).

- Member, Editorial Board, *Open Journal of Radiology (OJRad)* (January 2012 – present).
- Member, Editorial Board, *Nanoscience & Nanotechnology-ASIA* (January 2011 – present).
- Editor (Devices), *Journal of Semiconductor Technology and Science* (January 2010 – present).
- Member, Editorial Board, *Nanotechnology* (January 2010 – present).
- Member, Editorial Board, *Research Letters in Electronics* (January 2009 – present).
- Member, Editorial Board, *The Journal of Nanoelectronics and Optoelectronics* (March 2007 – present).
- Executive Editor, *Fluctuation and Noise Letters* (March 2001 – present).
- Member, Editorial Board, *Microelectronics Journal* (May 2006 – present).
- Guest Editor, Special Issue of *Journal of Industrial Information Integration* on “Future Buildings and Homes Under the Context of Internet-of-Things and Industry 4.0” (2017).
- Guest Editor, Special Issue of *Photonics* on “Advanced Photodetectors Devices and Technologies” (2016-2017).

## EDITORIAL RESPONSIBILITIES - Previous

- Associate Editor, *IEEE/OSA Journal of Display Technology* (January 2011 – Dec 2016).
- Member, Editorial Board, *Open Journal of Applied Physics* (2007 – 2014).
- Member, Advisory Board of Editors, *Int'l Journal of High Speed Electronics and Systems* (June 2006 – Dec 2013).
- Regional Editor, *IEEE Electron Devices Society (EDS) Newsletter* – Canada and Central USA (Nov 2004 – Dec. 2010).
- Editor – Solid-State, *IEEE Transactions on Electron Devices* (April 2001 – March 2010).
- Member, Editorial Advisory Board, *Interface, an Electrochemical Society Publication* (April 2001 – May 2007)
- Member, Editorial Board, *The Journal of Nanoscience and Nanotechnology* (September 2004 – December 2005).
- Guest Editor, Special Issue of *IEEE Tran El Dev - Compact Interconnect Models for Gigascale Integration* (Sep 2009).
- Guest Editor, Special Issue of *IET Circuits, Devices and Systems* – Special Issue of **IEEE/SPIE International Conference on Computers and Devices for Communications (CODEC) 2006** (1 February 2008).
- Guest Editor, Special Issue of *IEEE Tran El Dev - Advanced Compact Models & 45-nm Modeling Challenges* (Sep '06).
- 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).
- Guest Editor, Special Issue of *IEE Proc. - Circuits, Devices & Systems* 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) (2002).

## RESEARCH INTERESTS

Microelectronics/Nanoelectronics, Optoelectronics – Bioimagers; Biosensors; Device Physics, Modeling and Characterization; Integrated Circuits; Plastic Microelectronics. Most applications are in health and environmental sciences.

**One measure of Research Impact:** H-index ~ 53, Citations ~ 9580 (Google Scholar, Feb 2017).

## CAREER PUBLICATION RECORD

### Book, Refereed Book Chapters or Edited Books/Conference Proceedings: 47

- |   |    |
|---|----|
| • Authored/Edited Books or Conference Proceedings | 23 |
| • Invited Book Chapters                           | 19 |
| • Contributed Book Chapters                       | 5  |

### Patents (six have been extensively used in industry): 12

### Refereed Journal Publications: 313

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|--------------------------|-----|
| • Invited Journal Papers | 32  |
| • Journal Papers         | 281 |

### Refereed Conference Publications: 234

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|---|-----|
| • Plenary , Keynote or Invited Refereed Conference Publications | 87  |
| • Contributed Conference Papers                                 | 147 |

## Conference Publications (Only Abstracts and Extended Abstracts): 197

- Plenary, Keynote or Invited Conference Abstracts 82
- Contributed Conference Abstracts 115

## Commissioned Technical Reports: 64

### PROFESSIONAL CITIZENRY/SERVICE

- Offices Held in Professional Societies 54
- Conferences – Organizer, Chair, Program Committee Member, etc. 160
- Session Chair/Co-Chair at Conferences/Symposia 114
- Reviewer for 67 journals and 89 conferences/symposia
- Invited Seminars - University, Industry and Research Organizations 237
- Short Courses, Panels and Workshops- Industry, University, Conference 14

## Few Examples of Current/Very Recent Professional Citizenry/Service

- President, *Academy of Sciences, The Royal Society of Canada (RSC) - The Academies of Arts, Humanities and Sciences of Canada* (2015-2017).
- Chair, *Academy of Science Council, The Royal Society of Canada* (2015-2017).
- Chair, *Academy of Science Executive Committee, The Royal Society of Canada* (2015-2017).
- Chair, *Academy of Science Committee on Selection of New Fellows, The Royal Society of Canada* (2015-2017).
- President Elect, *Academy of Sciences, The Royal Society of Canada* (2014-2015).
- Director, Division of Applied Sciences and Engineering, RSC (2011-2013, 2013-2015).
- Chair, *Fellow Selection Committee*, Division of Applied Sciences and Engineering, RSC (2011-2013, 2013-2015).
- Vice-President – *Membership*, IEEE Electron Devices Society (2012-2013).
- Chair, *Nominating Committee*, Division of Applied Sciences and Engineering, The Royal Society of Canada – The Academies of Arts, Humanities and Sciences of Canada, Academy of Science (2011-2013).
- Member, IEEE Electron Devices Society Fellow Evaluation Review Committee (2011-2014).
- Chair, *Compact Modeling Committee*, IEEE Electron Devices Society (2009-2012).
- General Co-Chair, 23rd Int. Conference on Noise and Fluctuations (ICNF 2015), Xian, China (June 2015).
- General Co-Chair, 2<sup>nd</sup> IEEE International Symposium on Future Information and Communication Technologies for Ubiquitous Healthcare (Ubi-HealthTech 2015), Beijing, China (May 2015).
- Lead-Organizer, *Integrated Optoelectronics 7, 225<sup>th</sup> Meeting of the Electrochem Society*, Orlando, FL (May 2014).
- General Chair, 1<sup>st</sup> IEEE International Symposium on Future Information and Communication Technologies for Ubiquitous Healthcare (Ubi-HealthTech 2013), Jinhua, China (July 2013).
- Co-Chair, *Int'l Advisory Ctee, Int'l Conf Computers & Devices for Communications (CODEC)*, Kolkata (Dec '12).
- General Chair, 21<sup>st</sup> Int. Conference on Noise and Fluctuations (ICNF 2011), Toronto, Canada (12-16 June 2011).
- Chair, *Operations and Maintenance Support for Research Equipment (OMSRE) Selection Committee*, Natural Sciences and Engineering Research Council of Canada (2016-2017).
- Chair, *Digital Media/ICT, Strategic Review Panel*, Ontario Research Fund – Large Infrastructure Competition, Ministry of Economic Development and Innovation (2011-2012).
- Chair, *GSC 1051 – Major Resources Support*, Natural Sciences & Engineering Research Council of Canada (2010-11).

## PERSONNEL TRAINING (Career) 216

- Visiting Professors, Post-Doctoral Fellows and Research Associates 47
- Ph.D. Students 42
- M. Eng and M.A.Sc. Students 64
- B.A.Sc. Students 63

## RESEARCH GRANTS IN RECENT PAST (2001 to present) \$86,420,225

- Sole Investigator or Principal Investigator (PI) from 2001 to present \$20,624,894
- Co-investigator from 2001 to present \$65,795,331





**SHORT BIOGRAPHY:** **M. Jamal Deen**, born in Georgetown, Guyana, South America, is Distinguished University Professor, Senior Canada Research Chair in Information Technology, and Director of the Micro- and Nano-Systems Laboratory, McMaster University. He completed a B.Sc. degree in Physics and Mathematics at the University of Guyana (1978), a M.S. degree (1982) and a Ph.D. degree (1985) in Electrical Engineering and Applied Physics at Case Western Reserve University (CWRU), Cleveland, Ohio, U.S.A. His Ph.D. dissertation was on the design and modeling of a new CARS spectrometer for dynamic temperature measurements and combustion optimization in rocket and jet engines and was sponsored and used by NASA, Cleveland, USA. He received four honorary doctorate degrees from the University of Waterloo, ON, Canada (2011), the Universidad de Granada, Granada, Spain (2012), the Universitat Rovira I Virgili (URV), Tarragona, Spain (2014), and El Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE), Puebla, Mexico (2016) for his exceptional scholarly achievements and service contributions, and exemplary professionalism.

From 1978-1980, Dr. Deen was an Instructor of Physics at the Univ. of Guyana, and from 1980 to 1983, he was a Research Assistant at Case Western Reserve University. He was a Research Engineer (1983-1985) and then an Assistant Professor (1985-1986) at Lehigh University, Bethlehem, Pennsylvania. In 1986, he joined the School of Engineering Science, Simon Fraser University, Vancouver, British Columbia, as an Assistant Professor, and from 1993 to 2002, he was a Full Professor.

Dr. Deen was a Visiting Scientist at the Herzberg Institute of Astrophysics, National Research Council, Ottawa in summer 1986, and he spent his sabbatical leave as a Visiting Scientist at Northern Telecom, Ottawa in 1992-1993. He was a Visiting Professor in the Faculty of Electrical Engineering, Delft University of Technology, in summer 1997 and a CNRS Directeur de Recherche at the Physics of Semiconductor Devices Laboratory, Grenoble, France in summer 1998 and at the Université de Montpellier II, France in 2002-2003, and an Invited Professor at the Technische Universität Berlin, Fachgebiet Mikrowellentechnik from January to July 2007.

Dr. Deen has published extensively in micro-, nano- and opto-electronics. Dr. Deen's research record includes more than 545 peer-reviewed articles (about 20% are invited) with an h-index of 53, two textbooks on **Silicon Photonics—Fundamentals and Devices** (Wiley, 2012), **Fiber Optic Communications – Fundamentals and Applications** (Wiley 2014), 23 authored/edited books and conference proceedings, 19 invited book chapters, 12 awarded patents, six of which have been used in industry, and 17 best paper/poster/presentation awards. He has also served as a consultant to the semiconductor industry in Canada, the USA and Japan. His research interests include nanoelectronics, optoelectronics, nanotechnology, and their emerging applications in health and environmental sciences.

Dr. Deen is founding Executive Editor of *Fluctuations and Noise Letters*; Co-Editor-in-Chief of *International Journal of High Speed Electronics and Systems*, Co-Editor-in-Chief, *Micro and Nanosystems* and a Member of the Editorial Boards of several journals including - *The Journal of Nanoelectronics and Optoelectronics*, the *Microelectronics Journal*; *Nanotechnology*, and the *Open Journal of Applied Physics*. Dr. Deen has served as the technical chair, general chair, principal organizer, member of the technical committee or member of the international steering committee of numerous conferences in his fields of research.

Dr. Deen is a member of Eta Kappa Nu, the Electrical Engineering honor society. As an undergraduate student, he won the **Chancellor's medal** as the second best graduating student and the **Irving Adler prize** as the best mathematics student (1978). As a graduate student, he was a **Fulbright-Laspau Scholar** from 1980 to 1982 and an **American Vacuum Society Scholar** from 1983 to 1984. He was awarded a **NSERC Senior Industrial Fellow** in 1993. Dr. Deen is a **Distinguished Lecturer** of the IEEE Electron Device Society; was awarded the 2002 **Thomas D. Callinan Award** (2002) as well as the **Electronics and Photonics Division Award** (2011) from the Electrochemical Society; the **Distinguished Researcher Award**, Province of Ontario in July 2001; a **Humboldt Research Award** (2006) from the Alexander von Humboldt Foundation; an **IBM Faculty Award** in 2006; the **Eadie Medal** from the Royal Society of Canada in 2008, the **McNaughton Gold Medal (highest award for engineers)**, in 2013, the **Fessenden Silver Medal** in 2011, as well as the **Ham Education Medal** in 2014, all from IEEE Canada..

Dr. Deen has been elected by his peers as Fellow/Member of ten national academies and professional societies - Fellow of The Royal Society of Canada (**FRSC**) - The Academies of Arts, Humanities and Sciences of Canada (**the highest honor for academics, scholars and artists in Canada**), a Fellow of the Canadian Academy of Engineering (**FCAE**), Member (Academician) - European Academy of Sciences and Arts (**MEASA**), a Foreign Fellow of the Indian National Academy of Engineering (**FINAE-Foreign**), a Foreign Fellow of the National Academy of Sciences India (**FNASI-Foreign**); a Fellow of The Institute of Electrical and Electronic Engineers (**FIEEE**), a Fellow of The American Physical Society (**FAPS**), a Fellow of The Electrochemical Society (**FECS**), a Fellow of The American Association for the Advancement of Science (**FAAAS**), a Fellow of The Engineering Institute of Canada (**FEIC**) and an Honorary Member of the World Innovation Foundation (**HonMWIF**) – the foundation's highest honor.