

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

FRSC FCAE A-CAS FTWAS FNASI FINAE MEASA FCSSE FIEEE FAPS FECS FAAAS FEIC

Distinguished University Professor – McMaster University

Director, Micro- & Nano-Systems Lab.; Canada Research Chair in Information Tech. (2001-22)

Vice-President – North (Developed World), The World Academy of Sciences (2023-2026)

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

Department of Electrical and Computer Engineering, School of Biomedical Engineering

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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 - 2022	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 (DHC)	Institut National de la Recherche Scientifique (INRS), Québec, 13 May 2023.
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.
Fellow	CSSE, The Canadian Society of Senior Engineers, 29 January 2023.
Fellow	TWAS, The World Academy of Sciences (TWAS), 10 December 2019.
Academician (Foreign Member)	CAS, Chinese Academy of Sciences, 22 Nov 2019. China's highest national honor in the area of science and technology and highest academic title.
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 – Highest honor for scholars, artists & scientists in Canada.
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 – Highest honor from WIF.

International and National and Awards and Honors

Julian C. Smith Medal	EIC - Engineering Institute of Canada, 22 April 2023.
Technical Achievement Award	IEEE Technical Committee on Scalable Computing, 2022 – Top award.
C.C. Gotlieb Computer Award	IEEE Canada, 15 March 2022.
Technical Achievement Award	IEEE Technical Committee on Cyber-Physical Systems, 2020 – Top award.
Member	Order of Canada - 29 June 2018. Highest Civilian Honor in Canada.
National Distinguished Professor	Univ of Elec Science & Tech of China, Chengdu (Oct 2018 – Sep 2021).
Distinguished Visiting Fellowship Award	Royal Academy of Engineering, UK (University of Exeter), 2017.
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 – Top Award for Engineers.
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 – Only Engineering Award.
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

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 Univ. of Guyana (1978).
Chancellor's Medal	Second best graduating student of the University of Guyana (1978).

Other Competitive Awards for Research and Service

MUFA Award for Outstanding Service	McMaster University Faculty Association (MUFA), 20 March 2023.
MSU Macademics Lifetime Achievement Award	McMaster Student Union (MSU), McMaster University, 7 April 2022.
President's Award for Excellence in Graduate Supervision	Graduate Student Recognition Awards (Engineering Winner), McMaster University, 10 December 2021.
Honorary Professor	Huazhong Univ of Sci & Tech, Wuhan (Jan 2019, Lifetime appointment).
Honorary Professor	Beihang University, Beijing, China (June 2018, Lifetime appointment).

National Distinguished Professor	Univ of Electronic Science & Tech of China, Chengdu (Oct 2018 – Sep 21)
Honorary Professor	Xidian University, Xi'an, China, September 2017 -August 2020.
Distinguished Visiting Professor	Huazhong Univ. Science & Technology, Wuhan, China, Apr-May 2016 & 2017.
Honorary Professor	Shanghai University, 2015-2018.
Càtedres d'Excellència	Universitat Rovira I Virgili (URV), Tarragona, Spain, Feb-March 2016.
Distinguished Visiting Professor	Univ of Electronic Science & Tech, Chengdu, China, Dec 2015 – Dec 2018.
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.
Distinguished Researcher Award	Province of Ontario, July 2001.
IEEE Exemplary Student Branch Award for SFU (Deen - Counselor and Kwan - Student Chair) - Region 7, 1995.	
IEEE Outstanding Branch Counselor and Advisor Award for Canada - Region 7, April 1994.	
Reward and Recognition Award	Silicon Technology Division (P810), Northern Telecom, Ottawa, 1993.

Best Papers/Posters/Presentation Awards

Twenty-six Best Paper/Poster/Presentation awards from IEEE, IET etc. Conferences, Symposia and Workshops, 2004-2022.

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).
- Founding Executive Editor, Fluctuation and Noise Letters (March 2001 – present).
- Specialty Chief Editor (Bioelectronics), **Frontiers in Electronics** (2020 – present).
- Member, Editorial Board – **Scientific Reports** (2022 –); *Science China Information Sciences* (Jan 2022 -); **Sensors** (2019 –); *Applied Sciences* (2018 –); Circuits and Systems, *Journal of Electrical & Computer Engineering* (Jan 2013 –); *Micro and Nanosystems* (January 2012–); *Nanoscience & Nanotechnology-ASIA* (January 2011 –); *Nanotechnology* (January 2010 –). Editor (Devices), *Journal of Semiconductor Technology and Science* (January 2010 –); Assoc Editor, *Advanced Devices & Instrumentation* (Jun 2022 -); **IET Cyber-Physical Systems: Theory & Applications** (2017 -).

Research Interests

Nano-/Opto-electronics, Nanotechnology – Bioimagers; Biosensors; Data Analytics; Device Physics and Modeling; High-performance Integrated Circuits; Plastic Microelectronics. Most applications are in health and environmental sciences.

One measure of Research Impact: H-index ~ 84, Citations ~ 30,000 (Google Scholar, Nov 2024).

Career Publication Record

Book, Refereed Book Chapters or Edited Books/Conference Proceedings: 50

- Authored/Edited Books or Conference Proceedings 25
- Invited Book Chapters: 19 Contributed Book Chapters: 6

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

Refereed Journal Publications: 445

- Invited Journal Papers – 47; Journal Papers - 398

Refereed Conference Publications: 500

- Plenary, Keynote or Invited Refereed Conference Publications 224
- Contributed Conference Papers 276

Commissioned Technical Reports: 64

Professional Citizenry/Service

- Offices Held in Professional Societies 77
- Conferences – Organizer, Chair, Program Committee Member, etc. 203
- Session Chair/Co-Chair at Conferences/Symposia 122

- Reviewer for 73 journals and 89 conferences/symposia
- Invited Seminars & named lectures- University, Industry and Research Organizations 287
- Short Courses, Panels and Workshops- Industry, University, Conference 22

Few Examples of Current/Recent Professional Citizenry/Service

- Inaugural Vice-President – *North (Developed Countries)*, **The World Academy of Sciences** (Jan 2023 – Dec 2026).
- Chair, *International Academic Board*, **Institute of Cyber Science and Technology (ICST)**, Shanghai Jiao Tong University, Shanghai, China (1 July 2019 - present).
- Member, *Advisory Board*, **IEEE Technical Committee on Cyber-Physical Systems (CPS)** (2017 - present).
- Past President, *Academy of Sciences*, **The Royal Society of Canada (RSC) - The Academies of Arts, Humanities and Sciences of Canada** (2017-2019).
- President, *Academy of Sciences*, **The Royal Society of Canada (RSC)** (2015-2017).
- Chair, *Academy of Science Council*, **The Royal Society of Canada (RSC)** (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).
- Member, IEEE Electron Devices Society Fellow Evaluation Review Committee (2011-2014).
- Chair, *Compact Modeling Committee*, IEEE Electron Devices Society (2009-2012).
- General Chair, **2022 IEEE Hyper-Intelligence Congress**, Chengdu, China (18-21 Dec 2022).
- Honorary Chair, **SmartWorld Congress 2022**, Hainan University, Hainan, China (16-18 Dec 2022)
- Chair, *Nanosensors (S4)*, **7th Int'l Electronic Conf on Sensors & Applications**, MDPI On-Line Conf, (15-30 Nov 2020).
- General Chair, **3rd IEEE Int'l Symposium on Future Information and Communication Technologies for Ubiquitous Healthcare (Ubi-HealthTech 2019)**, Shaoxing, China (13-16 Dec 2019).
- Lead-Organizer, *Organic Semiconductor Materials, Devices, and Processing 6*, **235th Meeting of the Electrochemical Society**, Dallas, Texas USA, (26-31 May 2019).
- 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)

292

- Visiting Professors, Post-Doctoral Fellows and Research Associates 72
- Ph.D. Students 56
- M. Eng and M.A.Sc. Students 81
- B.A.Sc. Students 83

Research Grants in Recent Past (2001 to present)

\$103,194,629

- Sole Investigator or Principal Investigator (PI) from 2001 to present \$23,406,894

Co-investigator from 2001 to present \$79,787,735



SHORT BIOGRAPHY: M. Jamal Deen, born in Georgetown, Guyana, South America, is Distinguished University Professor (highest rank of a Professor in Canada), 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 five 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) and Institut National de la Recherche Scientifique (INRS), Québec, Canada (2023) for his exceptional research, scholarly and educational accomplishments, exemplary professionalism and valued services. As an educator, he won the Ham Education Medal (highest award for educators) from IEEE Canada, the McMaster University President's Award for Excellence in Graduate Supervision, and MSU Macademics' Lifetime Achievement Award for his exceptional dedication to teaching and significant contribution to student life, the community at large, and academia (highest award for exceptional lifetime teaching at McMaster University voted by the students).

Dr. Deen served as the **elected President of the Academy of Science**, The Royal Society of Canada in 2015-2017. Currently, he is serving as the inaugural elected **Vice President (North) of The World Academy of Sciences**, representing the developed countries. His current research interests are nanoelectronics, optoelectronics, nanotechnology, data analytics and their emerging applications to health and environmental sciences. He has also served as a consultant to the semiconductor industry in Canada, the USA and Japan. Dr. Deen's research record includes more than 900 peer-reviewed articles (about 20% are invited and an h-index of 78), two textbooks on **"Silicon Photonics- Fundamentals and Devices"** and **"Fiber Optic Communications: Fundamentals and Applications"**, 23 other authored/edited books and conference proceedings, 19 invited book chapters, 12 awarded patents of which 6 were extensively used in industry, and twenty-four best paper/poster/presentation awards.

From 1974 to 1978, Dr. Deen was a High School Teacher; from 1978-1980, an Instructor of Physics at the University 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 Univ., Vancouver, BC, 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 Universitaet Berlin, Fachgebiet Mikrowellentechnik from January to July 2007. He was a Distinguished Visiting Professor at SUSTech, Shenzhen, China (2017-2081) and at POSTECH, Pohang, S. Korea (2008-2013). Dr. Deen is founding Executive Editor of Fluctuations and Noise Letters; Co-Editor-in-Chief of International Journal of High Speed Electronics and Systems, and Micro and Nanosystems; and a Member of the Editorial Boards of several journals including - Applied Sciences, IET Cyber-Physical Systems: Theory & Applications, Journal of Semiconductor Technology and Science, and Nanotechnology. 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 **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 **Gotlieb Computer Award** in 2022, all from IEEE Canada; and the **Julian C. Smith Medal** from the Engineering Institute of Canada in 2023 *"For his remarkable achievements in the development of Canada."*

Dr. Deen has been elected by his peers as Fellow/Academician of thirteen 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**), Academician (Foreign Member) of The Chinese Academy of Sciences (A-CAS, **China's highest national honor in the area of science and technology and highest academic title**), a Fellow of The World Academy of Sciences (**FTWAS**), 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 Canadian Society of Senior Engineers (**CSSE**); 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. Also, he was elected to the **Order of Canada (July 2018), the highest civilian honor awarded by the Government of Canada.**