

Edwin Howard Armstrong Achievement Award Winner Biographies

H. Vincent Poor (2009)

"For fundamental contributions to signal processing for communications"

H. Vincent Poor received the Ph.D. degree in EECS from Princeton University in 1977. In that year he joined the faculty of the University of Illinois at Urbana-Champaign, becoming Professor of Electrical & Computer Engineering and Research Professor in the Coordinated Science Laboratory in 1984. In 1990, he returned to Princeton, where he is currently the Michael Henry Strater University Professor of Electrical Engineering, and Dean of the School of Engineering and Applied Science. He has also held visiting appointments at a number of other institutions, including most recently at Imperial College (London), Harvard and Stanford. He serves regularly as a consultant or advisor to industry and government, primarily in the areas of communications, networking and signal processing. His research interests lie in the applications of statistical signal processing, stochastic analysis and information theory to wireless networking and related fields. Among his many publications in these areas is the book *MIMO Wireless Communications* (Cambridge University Press, 2007), coauthored with Ezio Biglieri, et al.

Dr. Poor is a Fellow of the IEEE and is a member of the U. S. National Academy of Engineering. He is also a Fellow of the American Academy of Arts & Sciences, an International Fellow of the Royal Academy of Engineering of the U. K., and has been similarly recognized by several other scientific and technical organizations. A COMSOC member for 34 years, he has served in many volunteer roles within the Society and the IEEE more generally, including as a member of the IEEE Board of Directors in 1991-92. In recent years, he has received the IEEE Education Medal, the NSF Director's Award, a Guggenheim Fellowship, and the Distinguished Alumnus Award of Tau Beta Pi, and has been named an Eminent Member of Eta Kappa Nu. Among other recognition of his work are a number of paper awards, including recently the 2007 IEEE Marconi Prize Paper Award in Wireless Communications, and Best Paper Awards at the 2008 IEEE International Conference on Communications (Beijing), the 2008 IEEE Global Communications Conference (New Orleans), and the 2009 Symposium on Personal Indoor and Mobile Radio Communications (Tokyo).

Sergio Benedetto (2008)

"For fundamental, sustained contributions to Communication Theory"

Sergio Benedetto received the "Laurea in Ingegneria Elettronica" (summa cum laude) from Politecnico di Torino, Italy, in 1969. From 1970 to 1979 he was with the Istituto di Elettronica e Telecomunicazioni, first as a Research Engineer, then as an Associate Professor. In 1980, he was made a Professor in Radio Communications at the Università di Bari. In 1981 he returned to Politecnico di Torino as a Professor in Digital Transmission Theory at the Electronics Department, where he is currently the Director of the Center of Excellence in Multimedia Wireless Communication. He has been a Visiting Professor at several universities, including Christchurch University (New Zealand) as a winner of the Erskine Fellowship.

Professor Benedetto coauthored two Italian-language books in signal theory and probability and random variables and the books "*Digital Transmission Theory*" (Prentice Hall, 1987), "*Optical Fiber Communications Systems*" (Artech House, 1996), and "*Principles of Digital Communications with Wireless Applications*" (Plenum, 1999), as well as 290 papers in leading conferences and journals. He made pioneering contributions to communication theory including computationally efficient performance evaluation of digital transmission systems subject to intersymbol interference; an improved Kalman filter design of an adaptive equalizer; and evaluation of nonlinear amplifiers using Volterra series.

Professor Benedetto has been Chair of the Communication Theory Technical Committee. He was instrumental in organizing many IEEE conferences, was Technical Program Chair of the Communication Theory Symposium at ICC 2000 and ICC 2006, and General Chair of the Communication Theory Workshop in 2004. He has been Area Editor for *IEEE Transactions on Communications* and a Distinguished Lecturer of ComSoc. He was Vice President of Technical Activities of the IEEE Communications Society in 2006-07, and is currently (2008-09) our Vice-President for Publications.

Professor Benedetto is an IEEE Fellow and a member of the Science Academy of Torino. He received the "Premio Siemens per le Telecomunicazioni" at the International Conference on Communications of Genova in 1973, the "Premio Bianchi" of AEI in 1974, the "Premio Bonavera dell'Accademia delle Scienze di Torino" in 1976, the "Gold medal Award of Siemens Telecomunicazioni" for the years 1993 and 1995, the "Italgas International Prize for Research and Technological Innovation" in 1998, and the Cristoforo Colombo International Award for Communications in 2006.

Norman C. Beaulieu (2007)

"For outstanding contributions to the analysis, design, and modeling of wireless communication systems"

Norman C. Beaulieu received the B.A.Sc. (honors), M.A.Sc., and Ph.D degrees in electrical

engineering from the University of British Columbia, Vancouver, BC, Canada in 1980, 1983, and 1986, respectively. He was awarded the University of British Columbia Special University Prize in Applied Science in 1980 as the highest standing graduate in the Faculty of Applied Science.

He was a Queen's National Scholar Assistant Professor with the Department of Electrical Engineering, Queen's University, Kingston, ON, Canada from September 1986 to June 1988, an Associate Professor from July 1988 to June 1993, and a Professor from July 1993 to August 2000. In September 2000, he became the iCORE Research Chair in Broadband Wireless Communications at the University of Alberta, Edmonton, AB, Canada and in January 2001, the Canada Research Chair in Broadband Wireless Communications. His current research interests include broadband digital communications systems, ultra-wide bandwidth systems, fading channel modeling and simulation, communication theory, diversity systems, interference systems, and space-time coding.

Dr. Beaulieu is a Member of the IEEE Communication Theory Committee and served as its Representative to the Technical Program Committee of the 1991 *International Conference on Communications* and as Co-Representative to the Technical Program Committee of the 1993 *International Conference on Communications* and the 1996 *International Conference on Communications*. He was General Chair of the Sixth Communication Theory Mini-Conference in association with *GLOBECOM 97* and Co-Chair of the *Canadian Workshop on Information Theory* in 1999 and 2007. Dr. Beaulieu is presently serving as Co-Chair of the Technical Program Committee of the Communication Theory Symposium of the 2008 *International Conference on Communications*.

He has been an Editor for Wireless Communication Theory of the *IEEE Transactions on Communications* since January 1992, and was Editor-in-Chief from January 2000 to December 2003. He served as an Associate Editor for Wireless Communication Theory of the *IEEE Communications Letters* from November 1996 to August 2003. He also served on the Editorial Board of *The Proceedings of the IEEE* from November 2000 to December 2006.

He received the Natural Science and Engineering Research Council of Canada (NSERC) E.W.R. Steacie Memorial Fellowship in 1999. Professor Beaulieu was elected a Fellow of the Engineering Institute of Canada in 2001 and was awarded the Médaille K.Y. Lo Medal of the Institute in 2004. He was elected Fellow of the Royal Society of Canada in 2002 and was awarded the Thomas W. Eadie Medal of the Society in 2005. Also in 2005, Professor Beaulieu was awarded the Alberta Science and Technology Leadership Foundation ASTech Outstanding Leadership in Alberta Technology Award. In 2006, he was elected Fellow of the Canadian Academy of Engineering. He was the 2006 recipient of the J Gordin Kaplan Award for Excellence in Research, the University of Alberta's most prestigious research prize. Professor Beaulieu is listed on ISIHighlyCited.com and is a Communications Society Distinguished Lecturer.

Larry J. Greenstein (2006)

"For exceptional contributions to modeling of wireless channels, definition and analysis of

broadband wireless systems, and research management and mentoring"

Larry Greenstein received his Ph.D. in electrical engineering from Illinois Institute of Technology in 1967. From 1958 to 1970 he worked at IIT Research Institute on radio frequency interference and anti-clutter airborne radar. He joined Bell Laboratories in 1970 and, over a 32-year AT&T career, conducted and led research in digital satellites, point-to-point radio, fiber optic transmission, and wireless communications. He is now a research scientist at WINLAB, Rutgers University.

He is an IEEE Fellow, an AT&T Fellow, and a Member-at-Large on the IEEE Communications Society Board of Governors. He has won three best paper awards, and has been a Guest Editor, Senior Editor, and Editorial Board Member for numerous publications.

Hussein Mouftah (2004)

"For outstanding contributions to the design of optical networks and mobile wireless communication networks"

Hussein Mouftah joined the School of Information Technology and Engineering (SITE) of the University of Ottawa in September, 2002, as a Canada Research Chair (Tier 1) Professor in Optical Networks. He has been with the Department of Electrical and Computer Engineering at Queen's University (1979-2002), where he was prior to his departure a Full Professor and Department Associate Head. He has three years of industrial experience mainly at Bell Northern Research of Ottawa, now Nortel Networks (1977-79).

Hussein has spent three sabbatical years also at Nortel Networks (1986-87, 1993-94, and 2000-01), always conducting research in the area of broadband packet switching networks, mobile wireless networks and quality of service over the optical Internet. He served as Editor-in-Chief of *IEEE Communications Magazine* (1995-97) IEEE Communications Society Director of Magazines (1998-99), and Chair of the Awards Committee (2002-2003). He has been a Distinguished Lecturer of the IEEE Communications Society since 2000.

Dr. Mouftah is the author or coauthor of five books, 22 book chapters and more than 700 technical papers and 8 patents in this area. He is recipient of the 1989 Engineering Medal for Research and Development of the Association of Professional Engineers of Ontario (PEO), and the Ontario Distinguished Researcher Award of the Ontario Innovation Trust. He is the joint holder of the Best Paper Award for a paper presented at SPECTS'2002, and the Outstanding Paper Award for papers presented at the IEEE HPSR'2002 and the IEEE ISMVL'1985. Also he is the joint holder of a Honorable Mention for the Frederick W. Ellersick Price Paper Award for Best Paper in the *IEEE Communications Magazine* in 1993.

He is recipient of the IEEE Canada (Region 7) Outstanding Service Award (1995) and recipient of the 2004 George S. Glinski Award for Excellence in Research of the Faculty of Engineering, University of Ottawa. Dr. Mouftah is a Fellow of the IEEE (1990) and Fellow of the Canadian

Academy of Engineering (2003).

Hikmet Sari (2003)

"For outstanding contributions to the theory and design of digital communications systems"

Hikmet Sari received his Diploma (M.S.) and Ph.D. in Telecommunications Engineering from the ENST, Paris, France, and the Habilitation degree from the University of Paris XI. He was with Philips Research Laboratories from 1978 to 1989, first as Researcher and then as Group Supervisor. From 1989 to 1996, he was R&D Department Manager at SAT (SAGEM Group), and from 1996 to 2000, he was Technical Director at Alcatel. In May 2000, he became Chief Scientist of the newly-founded Pacific Broadband Communications, which was acquired by Juniper Networks in December 2001. Since April 2003, he has been a Professor and Chair of the Telecommunications Department at SUPELEC, an electrical engineering school located near Paris. His technical contributions over the past 25 years have covered adaptive equalization, interference cancellation, synchronization, bandwidth-efficient coded-modulation, multi-carrier transmission, and multiple access techniques, with applications to digital microwave radio, digital satellite and cable TV, broadband wireless access, and broadband cable networks.

Dr. Sari has published over 135 technical papers and holds over 25 patents. He was an Editor of the IEEE Transactions on Communications from 1987 to 1991, Guest Editor of the European Transactions on Telecommunications (ETT) in 1993, Guest Editor of the IEEE JSAC in 1999, Associate Editor of the IEEE Communications Letters from 1999 to 2002, and Chair of the Communication Theory Symposium of ICC 2002. In 1995, he was elevated to the IEEE Fellow Grade for his contribution to Advanced Signal Processing in Digital Microwave Radio Systems and he received the Andre Blondel Medal from the SEE (France). Presently, he is serving as a Distinguished Lecturer of the IEEE Communications Society and he is the Technical Program Chair of the forthcoming ICC 2004.

Michael B. Pursley (2002)

"For seminal contributions to spread-spectrum communications and adaptive protocols for mobile wireless communication networks"

Michael B. Pursley received the B.S. degree with highest distinction in 1967 and the M.S. degree in 1968, both in electrical engineering from Purdue University. He received the Ph.D. degree in electrical engineering from the University of Southern California in 1974. Dr. Pursley has several years industrial experience, primarily with the Space and Communications Group of the Hughes Aircraft Company. He was a Hughes Doctoral Fellow and a Research Assistant in the Department of Electrical Engineering at the University of Southern California. From January through June of 1974 he was an Acting Assistant Professor in the System Science Department of the University of California, Los Angeles.

From June 1974 through July 1993, he was with the Department of Electrical and Computer Engineering and the Coordinated Science Laboratory at the University of Illinois, Urbana, where he was promoted to the rank of Professor in 1980. Dr. Pursley is currently the Holcombe Professor of Electrical and Computer Engineering at Clemson University, Clemson, South Carolina. His research is in the general area of communications and information theory with emphasis on spread-spectrum communications, communication over fading channels, applications of error-control coding, protocols for packet radio networks, and mobile communications systems and networks.

Dr. Pursley is a member of Phi Eta Sigma, Tau Beta Pi, and the Institute of Mathematical Statistics, and he is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE). He was elected to three-year terms on the Board of Governors of the IEEE Information Theory Society in 1977 and again in 1989. In 1982 he was elected Fellow of the IEEE "for contributions to information theory and spread-spectrum communications." In 1983 he was elected president of the Information Theory Society. Dr. Pursley was a member of the Editorial Board of the Proceedings of the IEEE for the period 1984-1991. He is currently a member of Editorial Advisory Board for the International Journal of Wireless Information Networks, and he is a Senior Editor of the IEEE Journal of Selected Areas in Communications. He served as Technical Program Chairman for the 1979 IEEE International Symposium on Information Theory which was held in Grignano, Italy, and as Co-Chairman for the 1995 IEEE International Symposium on Information Theory in Whistler, Canada.

Dr. Pursley received Clemson University's McQueen Quattlebaum Faculty Achievement Award in 1995 and Clemson's Board of Trustees Award for Faculty Excellence in 1997 and 2000. He was awarded an IEEE Centennial Medal in 1984, and he is co-recipient (with John M. Shea) of the 1996 Ellersick Award of the IEEE Communications Society for the best paper in the unclassified technical program of the IEEE Military Communications Conference. In 1999 he received the IEEE Military Communications Conference Award for Technical Achievement "for sustained technical contributions to military communications," and he was awarded the IEEE Millennium Medal in 2000. In 2000 he was installed as an honorary member of the Golden Key National Honor Society.

Ezio Biglieri (2001)

"For contributions spanning three decades in the analysis, simulation, and design of digital communications systems"

EZIO BIGLIERI was born in Aosta (Italy) in 1944. He received his training in Electrical Engineering from Politecnico di Torino (Italy), where he received his Dr. \ Engr. \ degree in 1967.

From 1968 to 1975 he was with Politecnico di Torino, first as a Research Engineer, then as an Associate Professor. In 1975 he was made a Full Professor of Electrical Engineering at the University of Napoli (Italy). In 1977 he returned to Politecnico di Torino as a Professor in the Department of Electrical Engineering. From 1987 to 1990 he was a Professor of Electrical

Engineering at the University of California, Los Angeles. Since 1990 he has been again a professor with Politecnico di Torino.

He was elected three times to the Board of Governors of the IEEE Information Theory Society, and in 1999 he was the President of the Society. He was the general co-chair of the "IEEE 2000 International Symposium on Information Theory," Sorrento, Italy, June 2000. He is a Distinguished Lecturer for the IEEE Information Theory Society and the IEEE Communications Society.

Among his awards, in 2000 he received the "IEEE Donald G. Fink Prize Paper Award," and the IEEE Third-Millennium Medal for outstanding contributions to the Information Theory area of technology. He is a Fellow of the IEEE.

Laurence B. Milstein (2000)

"For seminal technical contributions in spread spectrum and CDMA wireless communications for commercial and military systems"

Laurence B. Milstein received the B.E.E. degree from the City College of New York, New York, NY, in 1964, and the M.S. and Ph.D. degrees in electrical engineering from the Polytechnic Institute of Brooklyn, Brooklyn, NY, in 1966 and 1968, respectively.

From 1968 to 1974, he was employed by the Space and Communications Group of Hughes Aircraft Company, and from 1974 to 1976, he was a member of the Department of Electrical and Systems Engineering, Rensselaer Polytechnic Institute, Troy, NY. Since 1976, he has been with the Department of Electrical and Computer Engineering, University of California at San Diego, La Jolla, CA, where he is a Professor and former Department Chairman, working in the area of digital communication theory with special emphasis on spread-spectrum communication systems. He has also been a consultant to both government and industry in the areas of radar and communications.

Dr. Milstein was an Associate Editor for Communication Theory for the IEEE Transactions on Communications, an Associate Editor for Book Reviews for the IEEE Transactions on Information Theory, an Associate Technical Editor for the IEEE Communications Magazine, and the Editor-in-Chief of the IEEE Journal on Selected Areas in Communications. He was the Vice President for Technical Affairs in 1990 and 1991 of the IEEE Communications Society, and has been a member of the Board of Governors of both the IEEE Communications Society and the IEEE Information Theory Society. He has been a member of the IEEE Fellows Selection Committee since 1996, and he currently is the chair of that committee. He is also the chair of ComSoc's Strategic Planning Committee. He is a Fellow of the IEEE, a recipient of the 1998 Military Communications Conference Long Term Technical Achievement Award, Academic Senate 1999 UCSD Distinguished Teaching Award, ECE Graduate Teaching Award, UCSD, 1999, and IEEE Third Millennium Medal, 2000.

Al Gross (1999)

"Life time achievement for pioneering efforts and the development of personal wireless communications systems"

Al Gross is a true pioneer of the wireless personal communications revolution and played a major role in establishing miniaturized portable communications. His efforts led to one of the first walkie-talkies in the early 1940's (just prior to WW II) and to development of the first pager system (in New York's Jewish Hospital) in 1950. He also successfully lobbied the Federal Communications Commission (FCC) to create the Personal Radio license spectrum in 1948, which later became citizens band radio.

In 1934 (at age 16) Al obtained his amateur radio license, and it is still current today. At the time, portable wireless communications did not exist, and very little knowledge about radio communications, circuits, designs, and propagation existed above 100 megahertz. Frequencies above 100 MHz is where Al focused his development efforts. He developed circuits and components for miniaturized portable communications that were unheard of for that era. He also succeeded in the design and construction of several battery-operated, portable, hand-held transceivers with corresponding compact antennas.

In the late 1930's, Al discovered a means to cause miniature vacuum tubes to operate in the unexplored portion of the radio frequency spectrum above 200 megahertz. Two of the models operated at 300 megahertz. These two hand-held models were used many times to successfully communicate with other amateur operators over a distance of 30 miles. After the onset of World War II, an amateur radio operator within the Office of Strategic Services (OSS) knew of Al's hand-held walkie-talkies; from this disclosure Al was asked to come to the OSS headquarters in Washington to demonstrate the radios. From this meeting, the "Joan Eleanor" two-way radio system was proposed allowing OSS agents in occupied countries and Germany to communicate with two-way radio equipment in high-flying aircraft. Al headed up this project and developed a sensitive receiver circuit that could be miniaturized. *Al met with Major E.H. Armstrong late in 1943 at his office in Alpine, New Jersey. Armstrong suggested a super regenerative circuit that could be used, and Mr. Gross implemented this concept (with modification) in both the transmitter and receiver.* The Joan/Eleanor project, Al Gross's creation, was classified "Top Secret" by the OSS and was made public in 1976.

Late 1944 in a classified meeting with the Chief of the Radio Intelligence Branch (FCC), two of Gross's hand-held transceivers were demonstrated before the FCC Chairman and with the Commissioners. Inspired by the demonstration, FCC Commissioner E. K. Jett published an article "Phone by Air" in the Saturday Evening Post (July 1945) describing personal two-way radio communications for the public use. Mr. Gross launched Citizens Radio Corporation to design, develop and manufacture personal wireless transceivers and also started Gross Electronics to design and build other communications products. (Gross Electronics was under contract to test and develop life saving equipment for emergency use for the U.S. Maritime Commission and the War Shipping Administration. In 1948 the company was contracted by the

U.S. Coast Guard to design and build a hand-held transceiver operating at 401 megahertz TRC-156.)

On March 23, 1948 at the President's Luncheon of the Institute of Radio Engineers (now IEEE), FCC Chairman announced FCC type approval of the first personal wireless transceiver for the public. *It was at this affair that Major Armstrong offered his congratulations to Mr. Gross and his company.*

In 1950 Al demonstrated before the FCC the possible use of a hand-held transceiver as a "cordless remote telephone", which became the first paging system of its kind. (Restrictions in place at the time prevented the application of this technology for the public.) In September 1958 Gross Electronics Co. received FCC type approval for mobile and hand-held transceivers for use on the Class D 27megahertz frequency allocation. In 1959 Gross Electronics Co. designed and manufactured a battery operated unattended weather station used by the U.S. Navy that was parachuted into the Antarctic.

It is clear that Mr. Gross was a true pioneer, and helped lead the way to today's wireless personal communications revolution. Today, Mr. Gross remains an active engineer at age 81 never missing an opportunity to tell a group of engineers or students about the excitement of wireless and about the tenacity required to invent. He is an inspiration to those who meet him, and he carries with him a terrific legacy that is worthy of recognition by the IEEE.

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