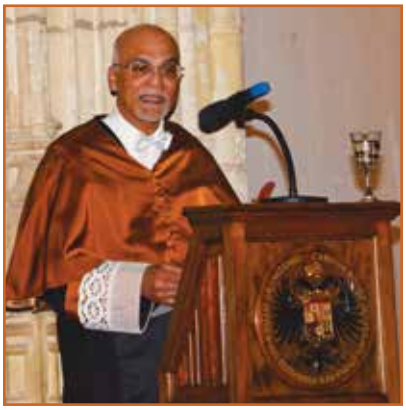
Jamal Deen Receives Prestigious Honorary Degree and Fellow Recognitions



M. Jamal Deen

McMaster University professor and senior Canada Research Chair in information technology, **M. Jamal Deen**, received the highest degree and honor—Doctor Honoris Causa—from the University of Granada, one of the major academic and intellectual centers in Spain. This honor was in recognition of his exceptional achievements as a scholar, academic, educator, and collaborator. The investiture of Prof. Deen's Doctor Honoris Causa was on May 25, 2012 in Granada. In introducing Dr. Deen, Prof. Tejada, his "padrino," collaborator, and nominator, stated that "Professor Deen is remarkable not only for the quality of his personal merits, but also collaborations with students and researchers in Granada. As other institutions have done before, we recognize his exceptional efforts as supervisor and mentor of a large number of researchers and engineers, as an excellent university teacher, and for his efficiency in transferring knowledge to other people. His personal career trajectory justifies" the highest degree Universidad de Granada granted him.

Professor Deen's address to students, professors, dignitaries, and honored guests was entitled "From Humble Beginnings to Life at the Intersection of Engineering and the Sciences." Professor Deen divided his speech in three parts. In the first part, subtitled "Hard Work, Competition, Team Work, and Respect," he described his early years in Guyana by illustrating the fruits of hard work, the benefits of staying focused, the challenges of being competitive, and the value of team work and respect for others. He explained the lessons of humility he has learnt—giving special thanks and appreciation to the many exceptional teachers he was fortunate to have.

The second part of his speech was subtitled "Life at the Intersection of Engineering and Sciences," and he presented some emerging trends in education and research. Using experience from his own scholarly work, he provided two of examples which involve inter- or intra-disciplinary interactions from some of his current and on-going collaborative research. He stated that these examples highlight rapidly emerging trends which require the convergence of expertise to solve important or pressing problems in our society. One example was the research and technology development of low-cost, scalable, engineered sensors for portable, real-time monitoring of water resources so that timely information can be obtained about the quality of water. He emphasized that this research is motivated by the fact that the availability of safe drinking water is fundamental to our health. His second example was in developing low-cost, miniaturized, and sensitive systems for minimally invasive screening and diagnoses of early stage malignancies. This research is motivated by the premise that the sooner a disease is caught, the higher the chances are for recovery. And more specifically, he explained how he and his collaborators use rapidly emerging technologies such as nanoelectronics, photonics, optics, and molecular imaging to develop minimal invasive endoscopic imaging systems.

He also emphasized that an oft-overlooked aspect of these multidisciplinary projects is communication. He stated, "In fact, communicating effectively is critical, not only for students in arts or humanities, but especially for those in other fields such as engineering, science, or medicine who may be collaborating on large projects locally or globally. Further, if we examine some of the grand challenges that you will have to tackle—universal access to clean water, reverse-engineering of the brain, personalized learning, or improved and sustainable healthcare, effective solutions will be created by teams of researchers from different disciplines who must find commonalities in communication."

The third part of his address was subtitled "Changing Times, Tolerance, and Adaptability." Here he stated that his ability to adjust and adapt has been a major part of his success. Besides working in Guyana, he had the good fortune of working in North America, Europe, and Asia. This afforded his family and him the unique privilege to appreciate the vast spectrum of cultural diversity, rich traditions and work ethics and practices. These experiences have helped them develop and shape new and meaningful perspectives that encourage cultural tolerance and adaptability, both within the parameters of work and society. He ended by urging the students and researchers to "work hard, persevere, and adapt. And always remember, humility is the mark of greatness. Also, do not forget to thank your family, professors, and mentors for their support and guidance during your studies."

Dr. Deen was also one of the five foreigners elected Foreign Fellow of the The National Academy of Sciences, India in October 2012. "Founded in the year 1930, the National Academy of Sciences, India is the oldest Science Academy of the country." The fellow citation stated "Dr. M. Jamal Deen, Professor and Senior Canada Research Chair in Information Technology, McMaster, is a major contributor and world leader in micro-, nano-, and opto-electronics. He anchors innovative, important contributions in noise and modeling of semiconductor devices in fundamentals of physics by combining physics-based modeling with clever experiments. His research productivity and impact in these fields have been truly exceptional, not only for its originality and rigor, but also for its blend of theory and practice. He is the world's foremost authority in the modeling and noise of electronic and optoelectronic devices, particularly silicon transistors and high-speed photodetectors for application in wireless circuits and optical communication receivers. 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 numerous companies and research laboratories in Canada, USA, and Asia. His models that allow for the accurate prediction of noise in semiconductor devices and circuits have solved a major bottleneck in wireless communication systems today. His practical models for high performance optical detectors and experimental innovations to predict their reliability have contributed to the design and manufacture of reliable photodetectors in fiber-optic communication systems and has been used by a major Canadian company. He is in demand for invited lectures at conferences, research organizations and universities throughout the world to describe his fundamental contributions of microelectronics, optoelectronics for information and communication technologies. The recent Guyana Academic Achievement Award and Indo-Canada Chamber of Commerce Technology Achievement Award were given for his pioneering contributions and leadership in research, international education and collaborations. Dr. Deen's work has been recognized by his election as a Fellow of eight academies/learned societies, including three national Academies: RSC, CAE in Canada and NAE in India, as an Honorary Member of the World Innovation Foundation, the foundation's highest honor, as well as by winning the ECS DS&T Division's Callinan Award, a Humboldt Research Award from the Alexander von Humboldt Foundation, Germany, the Eadie Medal from the Royal Society of Canada, and twelve best paper/poster awards."

In Memoriam

Jerome Kruger: Corrosionist and Gentleman
(1927-2013)

by Robert P. Frankenthal

Mollee *and* **Jerry Kruger** *at the ECS Centennial Meeting in May 2002.*

Jerome Kruger, known to friends and colleagues as Jerry, died on March 31, 2013. He was born in Atlanta, Georgia (U.S.) on February 7, 1927. Dr. Kruger earned his BS and MS degrees in chemistry at the Georgia Institute of Technology in 1948 and 1949, respectively, and his PhD in chemistry at the University of Virginia in 1952.

At the conclusion of his graduate studies, Dr. Kruger joined the Naval Research Laboratory (NRL), where he remained until 1955. At NRL he studied the mechanisms of the action of wash primers and the corrosion mechanisms of zinc sacrificial anodes. In 1955, Dr. Kruger left NRL and joined the Corrosion Section of the Metallurgy Division of the National Bureau of Standards (NBS), now the National Institute for Standards and Technology (NIST). In 1966, he was named Chief of the Corrosion Section and, in 1975, the electrodeposition activities at NBS were also placed under him. He retired from federal service in 1983. Kruger's career, however, was far from completed. After serving as a Visiting Professor at the Technion in Israel, he joined the faculty of the Department of Materials Science and Engineering at The Johns Hopkins University in Baltimore, where he served as a full-time member of the Hopkins faculty, including a two-year term as the department chair, until his retirement in 1994.

During his years at NBS Dr. Kruger worked on a wide variety of corrosion subjects. He was the first to adapt ellipsometry to corrosion studies. In his early work he studied the oxidation, passivation, inhibitor activity, and chemical reactions on single-crystal surfaces of copper, iron, and silver. This led the way to the ellipsometric and electrochemical studies of the properties of passive films: their formation; breakdown and repassivation; localized corrosion such as pit initiation, pitting, and crevice corrosion; stress corrosion cracking; and corrosion under organic films and subsequent delamination. He also developed new ellipsometric methods, such as ellipsometric spectroscopy and numerous variations of it, for investigating oxide-covered surfaces. In addition, his work extended to understanding the mechanisms of stress corrosion cracking, corrosion under coatings, and the corrosion of nuclear waste containment materials.

Dr. Kruger and coworkers published a series of scientific papers in the 1970s on the structure of passive films from the point of view of crystalline *vs.* non-crystalline *vs.* amorphous films. This work included the first definitive demonstration of the three-dimensional character of passive films. From this and additional work by Jerry and co-workers, came an understanding of the highly beneficial role of chromium and hydrogen in passive films. This work presented a substantially different point of view than that generally accepted by others at that time. The fundamental ideas of bond-flexibility and oxide-film adaptability put forth by Kruger and Revesz are still considered as important issues in the behavior of passive films.

Another often cited accomplishment, which involved Dr. Kruger, is the 1978 report entitled "Economic Effects of Metallic Corrosion in the United States," NBS Special Publication 511-1. This report, written by a team of coworkers at NBS, was prepared at the request of the U.S. Congress and was the most extensive and quantitative analysis of the economic consequences of corrosion ever conducted, covering every economic sector. It not only detailed costs, it also enumerated the savings that could be achieved by use of the best currently available technology. The study has been extensively used and quoted by industry and government.

While at NBS, Dr. Kruger and coworkers developed a procedure for the restoration and conservation of bronze statuary on the Memorial Bridge in Washington, DC for the National Park Service. Kruger's activities in conservation of statuary and other art objects expanded thereafter. He was an organizer of an international symposium that facilitated a dialogue between corrosion scientists, museum conservators, and archaeologists. He served on a NACE committee concerned with the preservation of art and cultural objects which organized dialogue between engineers and conservators on preservation issues. Several of his students at Johns Hopkins performed their graduate studies on degradation mechanisms of art objects. He also developed and conducted a very popular seminar course at Hopkins on degradation and conservation of art objects. While at Hopkins he started a program in cooperation with the Conservation Analytical Laboratory at the Smithsonian Institution in Washington, DC for PhD students in materials science to study and research conservation science topics.

Professor Kruger continued his exceptional productivity at Johns Hopkins. He was one of the founders and the first director of the Corrosion and Electrochemistry Research Laboratory. Professor Kruger advised 12 PhD and six MS theses and developed and taught two specialized and highly comprehensive graduate courses in corrosion science and engineering. His research program during this time included an extension of the work started at NBS with G. Long utilizing extended X-ray absorption fine structure and near-edge X-ray absorption fine structure to study the structure, composition, and electronic properties of passive films. This work contributed to the understanding of the role of chromium and other alloying elements in the passivity of metals and alloys, the mechanisms of passivity

of several metals and alloys in a variety of organic solutions, and the innovative development of dynamic imaging microellipsometry and its application to the study of passive films at second phases in aluminum alloys.

During his career, Dr. Kruger's accomplishments resulted in the authorship or co-authorship of over 160 technical papers, the editing or co-editing of six books, and recognition in the form of the major corrosion awards in the world. These included the Silver Medal for Meritorious Service of the Department of Commerce "for exceptional achievement in surface metallurgy especially for researches on the kinetics of film formation and passivity in corrosions reactions;" the Gold Medal for Distinguished Service of the Department of Commerce "for distinguished leadership of groups carrying out research on the corrosion of metals and alloys of technical importance to the government;" the Presidential Rank Award of Meritorious Achievement in the Senior Executive Service of the U.S. Government; the Samuel Wesley Stratton Award for Outstanding Contributions to Research, NBS; appointment as Conseiller-Scientifique to the Commission of Fundamental and Applied Studies of the European Federation of Corrosion; the Willis R. Whitney Award of NACE International; Fellow of NACE International; the Outstanding Achievement Award of the Corrosion Division of The Electrochemical Society (ECS) (later named the Uhlig Award); Honorary Membership in ECS; Fellow of ECS; and the Olin-Palladium Medal Award of ECS, the highest award in electrochemistry and corrosion in the Society; the Blum Award of the National Capital Section of ECS; the Ulick R. Evans Award of the British Institute of Corrosion and the accompanying Wilkinson Sword; and Honorary Fellow of the Institute of Corrosion in the United Kingdom. Dr. Kruger was the first recipient of the Jerome Kruger Award for Corrosion Science of the Baltimore-Washington Section of NACE International.

Dr. Kruger has served in many important and prestigious positions for the corrosion community. Among these are: Divisional Editor of the *Journal of The Electrochemical Society*; Chair of the Corrosion Division and Member of the Board of Directors of ECS; Treasurer of ECS; and co-editor of the famous, and often quoted, ECS volume entitled "Passivity of Metals;" (An acquaintance of the author recently witnessed the book, which was published in 1979, being used as a reference in ongoing work to understand and repair the corrosion damage to the Japanese nuclear reactors damaged by the tsunami.) Dr. Kruger was also Chair of the Gordon Research Conference on Corrosion; Member of the NACE Board of Directors; President of the Federation of Materials Societies; and President of the International Corrosion Council. He served on many more symposium organizing committees, advisory panels, visiting committees, and editorial boards. These varied and unselfish contributions to the field include: one of the organizers of the First International Symposium on Ellipsometry; consultant to MIT on directions for their materials program; Chair of the NACE Conference on Fundamental Corrosion Research in Progress; member of the NSF sponsored delegation of U.S. corrosion scientists and engineers to visit the USSR to assess the corrosion situation there; Co-Chair of the 4th International Symposium on Passivity; and membership on the advisory committees for the Corrosion Center at the University of Minnesota, the Surface and Coating Center at Lehigh University, and the Center for Electrochemical Sciences and Engineering at the University of Virginia. Through the years, Dr. Kruger lectured at universities and research laboratories all across the United States and in Israel, Japan, Argentina, France, South Africa, Canada, the United Kingdom, the Soviet Union, Egypt, Belgium, and Greece.

A discussion of Jerry Kruger would not be complete without a few words about his greatest assets—his personality and his relationship with coworkers, colleagues, and students. He was a wonderful, warm, caring human being, who was also an excellent scientist, teacher, organizer, and administrator. It was a pleasure to work with him. He was as dedicated to his coworkers and colleagues as he was to his work. He was well known and often praised for his willingness to spend time with students discussing their own research, for his genuine interest in them, and for making insightful suggestions for continued work. Students respected him because of his ability to teach—he knew the difference between teaching and lecturing—and because of his interest in and concern for their studies, their research, and their personal welfare. In addition, he was a person with whom one could enjoy or discuss most subjects and issues, whether they were scientific, cultural, or current events.

Jerome Kruger leaves behind his beloved wife of 58 years, Mollee Coppel Kruger; two sons and their wives, Lennard and Cynthia Kruger and Joseph and Dena Kruger; his sister, Betty Hecht; and two grandchildren, Isaac and Mira Kruger.

Jerry Kruger was a great scientist, an honorable gentleman, a wonderful human being, and is a sorely missed friend.

Acknowledgments

This tribute is based on a paper by P. J. Moran and R. P. Frankenthal, in *Critical Factors in Localized Corrosion III*, R. G. Kelly, G. S. Frankel, P. M. Natishan, and R. C. Newman, Editors, PV 98-17, p. xi, The Electrochemical Society Proceedings Series, Pennington, NJ (1999).

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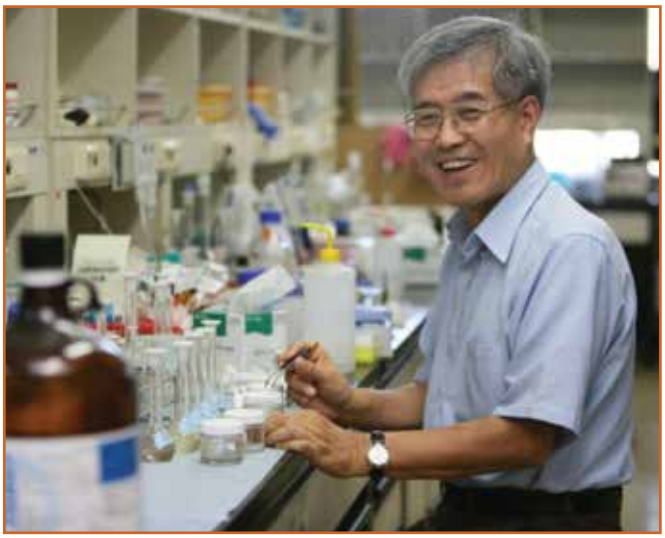
In Memoriam

Su-Moon Park
(1941-2013)



Su-Moon Park received his undergraduate chemistry degree from Seoul National University in 1964. Immediately after college he worked in Korea for the Choong-Ju Fertilizer Corp. (1964-1967) and the Yong-Nam Chemical Co. (1967-1970). During this period he spent much of his free time studying, with the dream and end goal of someday pursuing further degrees in the United States. In due course he moved to the U.S. and received an MS degree in organic chemistry from Texas Tech University in 1972 and then completed his PhD in 1975 with Allen J. Bard (The University of Texas at Austin) in the field of electrochemistry.

During his PhD studies Su-Moon was an exemplary graduate student. He was part of a group investigating the mechanisms and applications of electrogenerated chemiluminescence (ECL), a technique in which light is generated from electron transfer reactions of reactants in an electrochemical cell. ECL later became an important analytical method in clinical chemistry for immunoassays and is still widely used. Su-Moon's work involved the generation of excited state complexes, called exciplexes, $(AD)^*$. He was the first to demonstrate that exciplexes could be produced electrochemically by reaction of A^- and D^+ to form $(AD)^*$ and that such reactions could be observed in solvents with high dielectric constants where formation of $(AD)^*$ by the usual approach of reaction of A* and D was not possible. His work resulted in his PhD dissertation entitled, "Exciplexes in Electrogenerated Chemiluminescence," and four research papers in peer-reviewed journals.

In 1975, Su-Moon and his family packed their bags in Austin and drove across West Texas to join the chemistry faculty at the University of New Mexico in Albuquerque. He remained at UNM for 20 years, and it was during this period that he established his international reputation as an electrochemist and raised his three children. At UNM he published nearly 150 peer-reviewed scientific articles in the best national and international journals in his field. Starting at the beginning of his independent career and continuing until his death, he was a leader in the study of electrically conducting polymers. During his earliest days at New Mexico he also developed his interest in *in situ* spectroelectrochemistry and impedance spectroscopy, methodologies he pioneered and which he subsequently applied to other electrochemical systems and materials. Indeed, his careful experimental studies, framed with the appropriate theory, of fundamental electrochemical process in the 1990s have had an important impact on our understanding of energy storage materials, corrosion, and organic electrochemistry. As an assistant professor, one of us (Crooks) had the privilege of being Su-Moon's colleague at UNM, and they held joint weekly research group meetings for four years. It is difficult to imagine a better senior colleague (in every way), particularly for a new academic scientist finding his way, than Su-Moon.

Su-Moon was not all business during his time at UNM. Indeed, he was a man of many talents and interests. While in Albuquerque, he spent hours tending to his vegetable garden. He was a runner before running was cool and could be observed jogging around his neighborhood in the evenings (not so easy at 5,000 feet!). He also enjoyed the intricacies of American football, and in particular his favorite team, the Dallas Cowboys. Whenever a conference or symposium took him to a state with an NFL football team, he would return with that team's jersey for his young son, Ilsun. Summers were spent on coast-to-coast tours of the U.S. with his wife and children in the family station wagon. Wherever he was, Su-Moon had a knack for discovering the best fishing spots and the most scenic hiking routes.

In 1995 Su-Moon returned to Korea, where he joined the faculty of Pohang University of Science and Technology (POSTECH). He continued his studies of conducting polymers during this period, but he expanded his research into the fields of chemical sensing, electrochemistry in ionic liquids, and development of new electroanalytical methods. In addition to his scientific research, he contributed his administrative talents to POSTECH as Department Chair, Dean of Sciences, Director of the POSTECH Basic Sciences Research Institute, and Director of the Center for Integrated Molecular Systems. He was Editor-in-Chief of *Bulletin of the Korean Chemical Society* from 1999-2003 and President of the Korean Electrochemical Society from 2004-2005. Throughout this period he continued to teach, and in 2005 was recognized with the award for best teacher from the POSTECH chemistry department.

In 2009, Su-Moon moved to Ulsan National Institute of Science & Technology (UNIST) as Chaired Professor in the Interdisciplinary School of Green Energy and Director of the World Class University (WCU) program. His contributions to research, administration of scientific research, mentoring of his junior colleagues, and teaching continued until his death.

Su-Moon was a member of ECS, the American Chemical Society, the Korean Chemical Society, the Korean Electrochemical Society, Phi Lambda Upsilon, and Phi Kappa Phi. He was a Fellow of Korea Academy of Science & Technology. During his life, he was honored with the T. K. Rhee Award of the Korean Chemical Society (2000); the Q. W. Choi Award in electrochemistry from the Korean Chemical Society (2001); The Khwarizmi International Award from the Iranian Research Organization for Science and Technology and UNESCO (2008); and the Sudang Prize from the Sudang Foundation (2010). He was recognized as one of the Highly Cited Researchers in Materials Science by ISI-Thomson Reuters and as one of the 25 most prolific authors for the *Journal of The Electrochemical Society*. Altogether he published more than 300 peer-reviewed scientific articles and book chapters and was awarded 12 patents. He co-authored two books: S.-M. Park and C.-H. Pyun, *Microcomputers in Laboratories* (1989); and W. Paik and S.-M. Park, *Electrochemistry – Science and Technology of Interfaces and Electrode Processes* (2001). He presented more than 400 scientific lectures around the world.

Although he had a great passion for research, study, and expanding the knowledge of his field of electrochemistry, Su-Moon's greatest love and passion were for his family: his wife, Sunhee; daughters Hyesun and Minsun; and his son and daughter-in-law: Ilsun and Eliza. He often entertained his family with his singing and dancing, which would always bring laughter. He regaled his children with tall tales from his own youth, and encouraged them to be imaginative free thinkers. He always enjoyed conferences and traveling more when his wife, Sunhee, was able to accompany him, and in 45 years of marriage he never once forgot her birthday or wedding anniversary. His passion for his students was a very close second to that of his family. Despite his many other professional responsibilities, he always found time to meet with his students to discuss their professional and personal concerns. He cared about people around him and wanted them to enjoy a life as happy and fulfilling as his own. Indeed, Su-Moon was a bit of an amateur philosopher. He said "No man grows by himself. A man is delicately raised by absorbing benefits from people and their society. Once he is grown up, he has to return those benefits to the society and is obliged to grow another him by doing the same things. This is the way of making the world better generation by generation." Su-Moon was a humble and highly respected man, and yet his influence on those who knew him was profound.

On January 15, 2013, Prof. Su-Moon Park was laid to rest in Chungju, South Korea, on the hillside where he played as a child, overlooking the house where he was born, next to his mother. He will be missed. However, for those of us who had the honor to call him father, husband, friend, colleague, or mentor, it is easy to close our eyes and see the honorable professor in a neat and humble suit with grey hair, warm smile, soft but persuasive voice, and compassionate eyes.

This memorial notice was prepared by Ilsun Park, Allen J. Bard, Richard M. Crooks, and Byoung-Yong Chang.

Wolfgang J. Lorenz (1933-2012)

Wolfgang J. Lorenz passed away last year in his home at the age of 79 years in the presence of his wife Ingrid after a long illness. He is survived by his wife of 52 years, and by his son Joerg Lorenz, who is a dentist in Aosta, Italy, his daughter-in-law Ornella, and their children Oceanna (6) and Ben (4).

Prof. Lorenz was a member of ECS for a very long time and became a Fellow in 1996. He started his research in electrochemistry with Kurt Schwabe and then crossed the Wall to finish his PhD studies in what was then West Germany. He became a Professor at the University of Karlrsruhe, Germany, where he succeeded H. Fischer. He initiated the Fischer Symposia that were held every three years in Karlsruhe. These symposia are now being held at different locations in Germany.

Prof. Lorenz had an active research group with many visitors initially mainly from what were then the East Block countries and later from countries such as Argentina and the U.S. He is the author or co-author of a very large number of publications and co-author of several books including one with his good friend E. Budevski.

I met Wolfgang Lorenz at an ECS meeting in Boston in the late 1960s and we were very good friends and colleagues since then. I will miss our regular phone calls.

This notice was contributed by Florian Mansfeld, FECS.

In Memoriam

G. Frens (d. 2013), member since1981, Physical and Analytical Electrochemistry Division

Arthur Reidlinger (d. 2012), member since 1966, Organic & Biological Electrochemical Division

Dieter K. Schroder (d. 2012), member since 1983, Electronics and Photonics Division