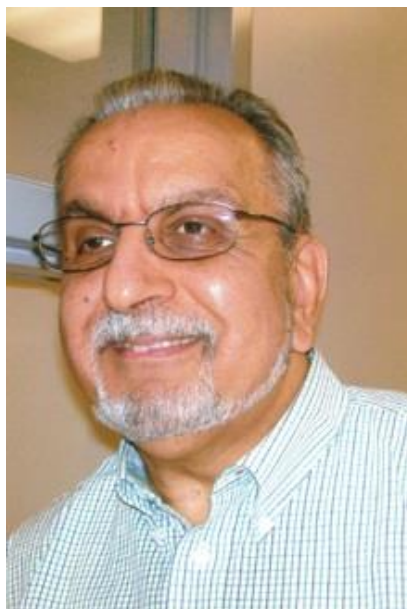

Professor Kenneth K. Laali

A Tribute



This special issue of ARKIVOC is dedicated to Professor Kenneth Laali on the occasion of his 65th birthday, to acknowledge his significant and wide ranging contributions to structural, mechanistic, and synthetic organic chemistry

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Kenneth K (Khosrow) Laali was born on July 5th 1951 in Tehran (Iran) and received his early education first in public and later in private schools in Tehran, where he gained a high school diploma with distinction in 1969, with emphasis on the natural sciences. While in high school he thought he would pursue a career in medicine, but his interest in chemistry grew, thanks mainly to his chemistry teacher in the 12th grade. In the summer of 1969, he took the highly competitive examinations for entry into university in Iran and was accepted to the chemistry program in the faculty of science of the University of Tehran, graduating in 1973 with a BS degree in Chemistry with distinction. With his mind set on graduate work in organic or polymer chemistry in the US or in the UK, he applied to and received offers from two US universities in the mid-west and from the University of Manchester in the UK, and after much consideration he chose the latter option, arriving in Manchester in January 1974. After a brief spell at Manchester University in the areas of polymer chemistry, he transferred to UMIST to work with Robert N. Haszeldine and Brian L. Booth on “*carbocation reactions catalyzed by trifluoromethanesulphonic acid*”, completing his PhD in just over three years.

A postdoctoral stint at King’s College London (with Victor Gold) was followed by research appointments in Strasbourg (with Jean Sommer), Amsterdam (with Hans Cerfontain), and ETH-Zurich (with Heinrich Zollinger). During this period (from mid-1977 to mid-1982) he worked on projects in carbocation chemistry and hydrocarbon activation in superacid media, dynamic NMR studies of proton exchange in superacids, electrophilic aromatic substitution, and diazonium ion chemistry. In 1982, with fourteen publications to his credit, he moved to the University of Southern California to work in George Olah’s group. This was an exceptionally productive and scientifically rewarding period that had a strong influence in shaping his independent research career since, during his time at USC he carried out research on a number of problems in stable ion chemistry, superacid catalysis, and onium ion chemistry that culminated in 13 publications with George Olah.

In 1985 Ken began his independent academic career at Kent State University in Ohio and a couple of years later he became a naturalized US citizen. He was promoted to Associate Professor in 1989 and Professor in 1996. After 24 years at KSU, in 2009 he moved to the University of North Florida as Professor and Founding Chair of a new chemistry department, and in 2013 he was named UNF’s 4th Presidential Professor. In his capacity as Department Chair (2009-2013) he administered and led a department of 21 faculty and staff. Under his leadership the department experienced significant growth in the faculty pool and major improvements were achieved that placed the department on a path to further success.

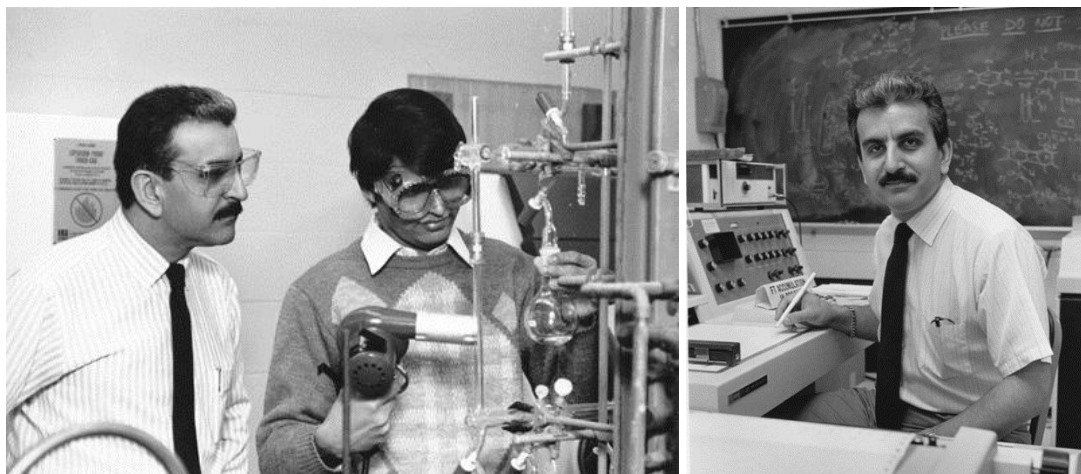


Figure 1. Ken as a young assistant professor at Kent State, carrying out a vacuum-line experiment with his graduate student, and recording NMR spectra on an 80 MHz instrument (circa 1987).

To date Ken has authored or co-authored 210 peer-reviewed publications, 4 monographs/books, an organic chemistry laboratory manual, and 9 book chapters. He and his students have presented over 150 invited and contributed research talks and abstracts in international, national, and regional meetings. He organized two highly successful international symposia at Pacificchem and at the Chemical Congress of North America, and subsequently initiated and led two symposium-based book projects.

Ken has been research adviser/mentor to a large group of postdocs, visiting scientists, postgraduate and undergraduate students from all over the world (US, Japan, India, UK, Germany, France, Italy, Colombia, Russia, Slovenia, Romania, Brazil, Argentina, China...), while engaging in numerous international collaborative research activities and joint projects.

During the Kent State era he spent three summer research visits in George Olah's group at USC and four summer research visits at Roskilde University in the context of a joint NATO grant with Poul Erik Hansen, during which times he and his wife, Jane, travelled extensively in Scandinavia where he delivered lectures in Sweden, Denmark, Norway and Finland. A highly productive collaborative program on stable ion studies of phosphalkynes and tetraphosphacubane with Manfred Regitz (Kaiserslautern) resulted in seminal papers in JACS and J. Org. Chem. Four PhD students from the Regitz group were involved in the collaboration and carried out the work in Ken's lab in Ohio. For several years he was involved in a fruitful collaboration with Marcos Eberlin (Campinas, Brazil) on ion-molecule chemistry that led to notable publications including a paper in JACS in 2000.



Figure 2. Former collaborators and postdocs (left photo - Laali lab at North Florida – Ken with Mahesh Lakshman, Anugu S. Reddy, and Barbara Zajc; right photo - Laali lab at Kent State - Ken with Gennady Borodkin, Volker Gettwert, and Takao Okazaki).

Ken visited Japan on three separate occasions, most recently as a JSPS (Japan Society for the Promotion of Science) fellow lecturing in Hiroshima, Tokyo, Tsukuba, and Mie Universities. Two PhD students from Slovenia (Stojan Stavber's group) and a PhD student from Cali-Colombia (Rodrigo Abonia's group) worked in Ken's laboratory in Florida. It is noteworthy that every one of these exchanges resulted in joint publications.



Figure 3. JSPS visit to Japan in March 2012 (left photo: at Mie-University with Toshikazu Kitagawa; right photo in Hiroshima with Yoshikazu Hiraga, Yohsuke Yamamoto, and Manabu Abe).

Research Focus Areas – a brief outline

Ken Laali is a recognized authority on structural/mechanistic studies with strong emphasis on the use of NMR, and has made full use of synthetic and theoretical approaches in order to solve a wide range of hydrocarbon chemistry-related problems. With the objective of developing carbocation-based structure reactivity relationships for comparison with bioactivity data based on DNA binding and mutagenicity, a major research emphasis area in Prof. Laali's laboratory over the years has been the generation and study of carbocations (arenium ions) derived from various classes of polycyclic aromatic hydrocarbons (PAHs) as models for metabolic activation of PAHs. By masterfully combining synthesis, stable ion NMR studies, and computational work, his studies provided a wealth of data on structure/conformation, stability, charge delocalization modes, and chemistry of PAH-arenium ions. These studies also contributed to the synthetic aspects of PAH chemistry.

Application of ionic liquids as novel media for electrophilic/onium ion chemistry and metal-mediated reactions constitutes another major research focus area in Ken's laboratory. Through these projects he has made significant contributions to heterocyclic chemistry, organofluorine chemistry, nitration, the generation and chemistry of tamed propargyl cations, diazonium ion chemistry, and the development of green halogenation methods.

More recently, Ken is applying his expertise in organofluorine and synthetic chemistry to lead collaborative projects aimed at the development of bio-active compounds with anti-tumor/anti-cancer properties.

On a personal note, I have known Ken for many years in various capacities including as postdoctoral mentor to my former PhD student Takao Okazaki (now an associate professor at my university), as symposium organizer at Pacificchem 2010, and as editor of the monograph "*Recent Developments in Carbocation and Onium Ion Chemistry*" in which I was a contributing author. I was also his host in a most recent visit to Japan as a JSPS fellow. On behalf of his friends, colleagues, collaborators, and students I take this opportunity to wish him, his wife, and his family (daughters and grand children) well and to congratulate him on his scientific contributions and research achievements spanning four decades.

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Representative Publications

1. Laali, K. K. Ionic Liquids as Novel Media for Electrophilic/Onium Ion Chemistry and Metal-Mediated Reactions: A Progress Summary. *ARKIVOC*, **2016** (i), 150-171.

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