Olah received the 1994 Nobel Prize in Chemistry for groundbreaking work on superacids and his observations of what are known as carbocations, a fleeting chemical species long theorized to exist, but never confirmed — until Olah devised a way to keep them around long enough to study their properties. What he found revolutionized the understanding of organic chemistry, leading to new discoveries, new fields of research and countless applications.

His discovery of how to make concentrated solutions of unusual hydrocarbon cations — using what he called "Magic Acids" — created an entire new field of chemistry of considerable theoretical and practical importance. The potent acids — billions or some cases even many trillions of times stronger than previously recognized "strong" acids such as concentrated sulfuric acid — can generate carbocations in solution that were previously thought to be impossible.

Olah also investigated whether a similar but more general approach could be used to produce what are called electrophiles. These are reagents — compounds causing chemical reactions — that are attracted to electrons and are highly reactive. This resulted in the development of the concept of superelectrophilic activation and the study of superelectrophiles.

His post-Nobel research focused not only on developing a promising new approach for solving long-range dependence on dwindling and nonrenewable fossil fuels, but also on mitigating global climate change caused by derived greenhouse gases such as carbon dioxide and methane. His novel approach — which he termed "the methanol economy" — was based on the use of methanol for energy storage as a convenient renewable liquid fuel to replace gasoline and diesel and as a feedstock for making petroleum-derived products.

Origins of an influential career

The chemist never claimed to have had a eureka moment in his research that led to his Nobel Prize. Instead, he credited long hours of laboratory routine that typically began just after dawn and continued until 10 at night.

Upon winning the prize, he singled out for praise his longtime collaborator at USC Dornsife, Surya Prakash — George A. and Judith A. Olah Nobel Laureate Chair in Hydrocarbon Chemistry and professor of chemistry.

Prakash went to Case Western Reserve University in 1974 as a 20-year-old PhD student to work with Olah and moved with him to USC in 1977 to help him establish the Loker Hydrocarbon

Research Institute. In the years since, the institute has trained more than 300 scientists and has had countless patents and discoveries. Olah was instrumental to the institute's tremendous growth.

"The chemistry George did was very original, but on top of that, he was a very kind and generous man," said Prakash, who today leads the institute. "In addition to bringing great credit to the chemistry department, he was one of the original pioneers who made this a great university: He brought scientific excellence and creativity to USC."

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Surya Prakash USC Dornsife Dean Amber D. Miller noted Olah's passing as a loss both to USC Dornsife and to the field of chemistry.
"He was an academic luminary whose passion for the process of discovery invigorated our university community over his four decades of service," Miller said. "As we mourn his loss, we also remember with gratitude that his pioneering research continues to inform new pathways for a sustainable future."

Olah was a firm believer in goal-oriented research, and his studies during his 40-year career at USC Dornsife were distinguished by their immense practical applications. He made significant contributions to the development of improved lead-free gasoline, cleaner high-octane gas and other promising nonpolluting fuels, as well as many chemical processes now used in pharmaceutical and industrial chemistry. His research also led to the development of a new kind of fuel cell, called the direct liquid methanol fuel cell, a highly efficient source of electricity.

He developed new methods to convert existing natural gas (methane) directly and efficiently to methanol. However, the true methanol economy, Olah argued, will do without fossil fuels like natural gas, oil and coal, instead producing methanol by the reaction of hydrogen with carbon dioxide collected from exhaust gases from power plants and various industrial emissions. Eventually, Olah proposed, it will be possible to separate atmospheric carbon dioxide and convert it to methanol, enabling mankind to liberate itself from dependence on fossil fuels. This approach has the added advantage of diminishing the danger of global warming by removing and recycling the rising carbon dioxide content of the atmosphere. The substantial energy required to

generate the needed hydrogen for methanol production could come from safe nuclear power plants and alternatives such as sunlight, wind and geothermal sources, he noted.

The Renaissance man

Olah was born in Budapest, Hungary, in 1927. He showed no interest in chemistry during his formative years. Instead, he followed a strict and demanding curriculum that heavily emphasized the humanities, including eight years of Latin and obligatory German and French.

That stayed with him later in life, when he became known in academic circles as a Renaissance man. “He was very well-read,” Prakash said. “He knew history, he knew philosophy. He appreciated music and art. He was a voracious reader.”

After high school, having survived the ravages of World War II in Budapest and perhaps cognizant of the difficulties of life in a small, war-torn country, he opted to study chemistry at the Technical University of Budapest. There he was particularly intrigued by organic chemistry, earning his doctoral degree in the subject and joining the faculty as assistant professor.

Invited to join the newly established Central Research Institute of the Hungarian Academy of Sciences as head of department of organic chemistry and associate scientific director in 1954, Olah established a small research group, which now included his wife, Judith Lengyel, whom he married in 1949. However, after the Soviet military crackdown on the Hungarian Uprising of 1956, the future for Olah and his team looked bleak. Some 200,000 Hungarians fled their country in the final months of that year for a new life in the West. Olah, his wife and young son and much of his research group were among them.

Brief stays in England and Canada were followed by their major move — to the United States. Olah became a scientist with Dow Chemical Co., which had recently established a small research laboratory in Michigan.

At Dow, a major user of carbocationic chemistry, Olah began his initial work on stable carbocations. His work had practical significance, helping to improve some industrial processes, and he was promoted to company scientist, the highest research position without administrative responsibility.

The move to academia

In 1965, Olah joined Western Reserve University in Cleveland, Ohio, as a professor and department chair. There he was instrumental in merging the chemistry department with that of neighboring Case Institute of Technology in 1967. After 12 years in Cleveland, where his work earned him membership in the National Academy of Sciences, Olah moved to California to join USC. Some 14 members of his research group, with Prakash, accompanied him. He embraced the challenge of building up USC's chemistry department — and he and his family fell in love with the Southern California lifestyle.

Aware of the need for a long-range program of basic research and graduate education in the field of hydrocarbon chemistry, Olah became founding director of the Hydrocarbon Research Institute, which opened its doors in 1979, thanks to a generous donation from Donald Loker and his wife, Katherine Loker '40. The institute was renamed in honor of the couple in 1984.

Olah was determined that receiving the Nobel Prize would not significantly affect his life nor his research. He felt he was successful in that goal, noting that with the help of dedicated younger colleagues and associates and by close collaboration with Prakash, he was able not only to continue his research but also to extend it into new and challenging areas.

Honors and prizes

He was a fellow of the Royal Society and Canadian Royal Society and a member of the National Academy of Sciences, National Academy of Engineering, Italian and Hungarian academies of sciences, and the European Academy of Arts, Sciences and Humanities.

In his native Hungary, he received awards ranging from the Semmelweis Budapest Award to the Széchenyi Grand Prize of Hungary. Olah also received honorary Doctor of Science degrees from the University of Sopron, Hungary and University of Munich, among others.

Besides the Nobel, his many prizes included the 2013 Eric and Sheila Samson Prime Minister's Prize for Innovation in Alternative Fuels for Transportation, the Priestley Medal from the American Chemical Society in 2005 and the USC Associates Award for Creativity in Research and Scholarship in 1985.

During his career, Olah authored or co-authored 20 books and close to 1,500 scientific publications. He held 160 patents from seven countries, including four for the transformation of natural gas into gasoline-range hydrocarbons.