DOCUMENTS OF THE GENERAL FACULTY

REPORT OF THE MEMORIAL RESOLUTION COMMITTEE FOR
HUGO STEINFINK

The special committee of the General Faculty to prepare a memorial resolution for Hugo Steinfink, professor emeritus, chemical engineering, has filed with the secretary of the General Faculty the following report.

Sue Alexander Greninger, Secretary
General Faculty and Faculty Council

IN MEMORIAM
HUGO STEINFINK

Hugo Steinfink, chemical engineering professor emeritus at The University of Texas at Austin, passed away August 25, 2012. He was born in Vienna, Austria, on May 22, 1924, and arrived in New York City in 1939, when the Austrians and Germans allowed his Jewish family to leave in return for all their possessions. In 1941, at the age of seventeen, he entered City College of New York, albeit only briefly, because in the war years 1942 to 1945, he served in the U.S. Army as a medic in the Pacific. In 1947, two years after his honorable discharge from the U.S. Army, he received his B.S. in chemistry from Columbia University, and just one year later, in 1948, he received an M.S. in chemistry.

In 1948, he joined the Exploration and Production Research Department of Shell Development Company, where his supervisor mistakenly assumed that an army medic, who took medical X-ray images, would also be qualified to perform industrial X-ray diffraction analyses. Fortunately, he was allowed to attend a two-week course on X-ray structural analyses taught by their grand master, Isidor Fankuchen, the first to determine structures of biological macromolecules, including viruses, from X-ray diffraction patterns. This course not only qualified him to do his work at Shell but, more importantly, encouraged him to join Fankuchen at the Polytechnic Institute of New York University in 1952 as a doctoral student. In just two years, he earned his Ph.D., along the way, co-developing a low temperature Weissenberg camera (Reviews of Scientific Instruments 24, 882-3, 1953), a key instrument for determining structures of materials, including proteins and DNA. In his doctoral dissertation, he applied the camera to determine the crystal structure of octamethyl cyclotetrasiloxane (Acta Crystallographica. 8, 420, 1955), the monomer used for producing silicone coatings that withstand the high temperature, for example, in kitchen ovens.

After obtaining his Ph.D. in 1954, Professor Steinfink returned to Shell Development Company in Houston as a research scientist, deciphering structures of complex silicon containing minerals. Even these early contributions were so important that he was elected, at the age of thirty-two, Fellow of the Mineralogical Society of America in 1956.

Professor Steinfink then joined the faculty of The University of Texas at Austin in 1960, serving the University and society for fifty-two years. In 1963, three years after joining the University as associate professor of chemical engineering, he was promoted to professor. In 1981, he was named the Jewel McAlister Smith Professor in Engineering. He retired from teaching, but not from research, in 1999.

Professor Steinfink loved teaching and was honored by multiple teaching excellence awards. For twenty-seven years, he taught one of the most important core courses of Chemical Engineering Thermodynamics (ChE 322), as well as chemical engineering, Materials (ChE 320), Introduction to Chemical Engineering Analysis (ChE 317), and he also taught, for thirty-five years, X-Ray Analysis, Practice and Theory.

He was a world class expert on the crystal chemistry, structure and physical properties of rare earth, and transition metal compounds. He led the team that defined, in 1987, the stoichiometry and structure of the high temperature superconductor YBCO (YBa$_2$Cu$_3$O$_{7-x}$), opening the field of structural-chemical research on these
unique and now technologically important materials, used as magnets for magnetic resonance imaging and for magnetic levitation. He did this work just two years after the precursor high temperature superconductors were discovered in 1986 by Karl Müller and Johannes Bednorz who were awarded the 1987 Nobel Prize in Physics for their discovery. Papers of Professor Steinfink’s team defining the crystal structure-high temperature superconductivity relationship in YBCO include “Identification and structural implications of the 90 K superconducting phase,” Journal of the American Chemical Society 109 (11) 3348-3353 (1987); “Studies of the influence of oxygen variation on the crystal-structure and phase-composition of the superconductor YBa2Cu3O7-δ,” Journal of the American Chemical Society 109 (22) 6667-6669 (1987); “Co and Fe substitution in YBa2CuO7-δ,” Journal of Materials Research 3(2), 248-256 (1988); and “The crystal-structure of the 1212-nonsuperconductor phase (Pb0.71Cu0.29)Sr2(Y0.75Ca0.25)Cu2O5,” Journal of Materials Research 4 (4) 763-766 (1989).

Beyond his studies of high temperature superconductors, Professor Steinfink authored and co-authored more than 150 articles on structure-property relationships in solid state materials. Materials systems included silicates, zeolites, rare-earth, and transition metal chalcogenides. An early series of his studies correlated synthesis and structure with physical properties of silicates, exemplified by “Crystal structure of triocatahedral mica -phlogopite,” American Mineralogist (7-8) 886 (1962). His contributions to syntheses and structures of transition metal chalcogenides include “Crystal structure of neodymium tritelluride”, Inorganic Chemistry 5(9), 1488 (1966); “Crystal chemistry of selected AB2 rare earth compounds with selenium tellurium and antimony,” Inorganic Chemistry 6(9), 1685 (1967); “Ternary sulfide compounds AB2S4 - crystal structures of GePb2S4 and SnBa2S6,” Journal of Solid State Chemistry 3(1) 75 (1971); and “Crystal structure and properties of barium nickel sulfide, a square-pyramidal nickel(ii) compound,” Journal of the American Chemical Society, 92(17) 5093 (1970). Examples of his studies of the crystal chemistries of transition metal oxides include “Crystal-structure and Mossbauer spectrum of vonsenite, 2FeO.FeBO3,” American Mineralogist 68(7-8), 827-832 (1983); “Crystal-Structure of Fe2P2O7,” Journal of Solid State Chemistry 47 (3) 278-283; (1983); and “Oxygen atom thermal vibration anisotropy in BA0.06K0.13B1O3,” Applied Physics Letters 53 (18) 1753-1755 (1988).

He was a core co-initiator of the materials science and engineering graduate program at UT Austin and guided the program through administrative channels to become a full-fledged M.S. and Ph.D. degree granting program. He was instrumental, for example, in recruiting John Goodenough who went on to earn the US National Medal of Science and the Japan Prize, primarily for his research that led to rechargeable lithium-ion batteries.

He was chair of the American Chemical Society, Central Texas Section, in 1966, a member of the American Institute of Chemical Engineers, Phi Beta Kappa, Phi Lambda Upsilon, and Sigma Xi. He served on the US National Committee for Crystallography; was president of the American Crystallographic Association in 1996, a co-editor of the Acta Crystallographica from 1984 to 1993, and an associate editor of the American Mineralogist from 1970 to 1972. He was also a board member of the American Institute of Physics from 1989 to 1995. Professor Steinfink was also an avid tennis and squash player even after he passed the age of eighty.

He was most proud of his family, his wife of sixty-four years, Cele; his son, Dan Steinfink, and his wife Beverly; and daughter, Susan (Steinfink), and her husband, Henri. He took great pride in his children and grandchildren, David Steinfink, and his wife, Ashely; Adam Steinfink; Sarah (Steinfink) Cogliandro, and her husband, Michael; and Nicole S. Soussan. He was blessed with a great-grandchild, Samuel Steinfink. He shared their joys and sorrows.

He combined brilliance, a sense of fairness, and a curiosity with a dry wit, for which he will be remembered by all who knew him. He had a love of learning and instilled his thirst for knowledge in his students, co-workers, children, and grandchildren.

This memorial resolution was prepared by a special committee consisting of Professors Adam Heller (chair), Donald R. Paul, and J. Steven Swinnea.

Distributed to the dean of the School of Engineering on May 13, 2013, and posted under “Memorials” at http://www.utexas.edu/faculty/council/.