



Charles D. Westbrook

CHARLES DAVID GRESKOVICH

1942–2007

Elected in 2000

“For innovations in technical ceramics and their manufacturing processes.”

BY DAVID W. JOHNSON AND MARIA GRESKOVICH

CHARLES GRESKOVICH, a well known and highly respected researcher at General Electric died of colon cancer July 7, 2007 at the age of 65.

Known as Chuck to all, he was born in Fredericktown, Pennsylvania on June 13, 1942, where his father was a coal miner. In 1960 he graduated from the Bethlehem Center Senior High School in Fredericktown, Pennsylvania.

Chuck studied Ceramic Science at Penn State University graduating with a B.S. in 1964 and a Ph.D. in 1968. That year he was also awarded an NSF Postdoctoral Fellowship in Germany where he studied at the Max Plank Institute. In 1969 he joined the Ceramics Laboratory of GE's Corporate Research & Development Center in Schenectady, New York as a staff ceramist. After a long productive career at The General Electric Global Research Center, he started his own consulting company in 2002, CDG Ceramic Solutions. He authored more than 60 publications and has 64 patents.

Chuck Greskovich was a researcher with scientific depth and a keen eye for engineering applications. These attributes contributed to a highly productive research career where his research and technological interests included preparation of optically transparent, polycrystalline ceramics, useful as scintillators in advanced medical x-ray detectors, arc tube envelopes for high intensity discharge lamps, ceramic lasers, and optical windows. Sintering polycrystalline ceramics to

dense transparent bodies demands exacting science and process in order to remove trace porosity that scatters light. He is co-inventor of the first efficient ceramic scintillator (described in more detail below), now used in nearly all computed tomography (CT) body scanners sold by GE since 1988. He developed the "Gas Pressure Sintering Process" used by many material companies and improved refractory ceramic molds. He published more than 60 scientific papers, and was awarded 64 patents.

At the GE Research Center Chuck Greskovich mentored many colleagues and enjoyed sharing his passion for understanding the basic physical processes behind ceramic processing. A great example is the development of the HiLight scintillator, the first transparent ceramic scintillator designed to accurately measure x-ray intensity for CT medical imaging. HiLight is very effective at converting x-rays into light and when assembled into a detector it is very dose efficient. For equivalent signal levels, the HiLight detector required less x-ray dose on the patient than competing technologies. Chuck championed this project from the beginning after recognizing that his transparent yttria could be made into a dense and efficient scintillator by understanding how to add gadolinium and europium. In addition, Chuck investigated many compositional and processing routes to eliminate radiation damage and afterglow, two critical material properties for the demanding CT application. As this technology matured through the development stage it required a host of expertise, from physicists who optimized the electronic defect structure, to chemical engineers who developed the powder processing, to electrical engineers who implemented the scintillator in a digital detector. Chuck had an innate ability to communicate the technically relevant aspects of the ceramic processing to all of these people, and worked tirelessly to optimize the material properties. Everyone who worked with him on this project, both at the GE Research Center as well as the GE healthcare business, recognized Chuck's enthusiasm for the technology, and was buoyed by it. Well into his retirement Chuck would return to the Research Center to teach ceramic seminars to younger colleagues.

Chuck had an amazing talent for developing cutting-edge technology and successfully tuning a process to work in a manufacturing setting. Chuck demonstrated this skill with GE's high intensity discharge lamp business. Ceramic metal halide lamps are very efficient, greater than 6 times more efficient than incandescent lamps, and can operate for 2 years of continuous service. There are significant thermomechanical stresses on the translucent aluminum oxide envelope that contains gases at pressures up to 30 atmospheres and an arc temperature up to 6500°C. One of the challenges in the original design was that the geometrically complicated lamp envelope was comprised of five discrete parts and prone to failure at the joints. Chuck realized this problem could be overcome with injection molding of aluminum oxide to achieve a more mechanically robust three-part design. Chuck took on the challenge to develop and scaleup an injection molding process. The result was a ten times increase in joint strength, improved dimensional control with less than 100 micron variation, and increased optical transmission. In addition, injection molding offered geometric flexibility to enable product offerings not possible with conventional dry-pressing.

Chuck Greskovich was elected to the National Academy of Engineering in 2000 with the citation: "For innovations in technical ceramics and their manufacturing processes." He was widely recognized by other awards. In 1978 he received the Ross Coffin Purdy Award from the American Ceramic Society for the most valuable contribution to the ceramic technical literature published in the previous year. In 1980 he was named a Fellow of the American Ceramic Society. In 1983 he was the American recipient of the Richard M. Fulrath Award of the American Ceramic Society which took him to Japan to lecture around the country. In 1991 he was awarded a Coolidge Fellowship, the GE R&D Center's highest honor. In 1997 the College of Earth & Mineral Science at Penn State University recognized him as "Centennial Fellow" for distinguished accomplishments that bring honor to the college and university, and in 1998 honored him with the Charles L. Hosler Alumni Scholar Medal for outstanding contributions to science through research. In 2001

he was awarded the TMS Distinguished Career Award by the Hudson Mohawk Chapter of TMS.

Chuck Greskovich always was an optimist and enjoyed life to the fullest. He was socially outgoing and treated everyone as his equal. He is remembered for his warm constant smile. He was an accomplished athlete with a lifelong enjoyment of golf, tennis and basketball. He enjoyed fishing and sought opportunities to share that passion with friends.

Chuck is survived by his wife, Maria; they were married on September 16, 1966. His survivors also include his three children, Charles Jr. (Chad), Ann Zenner and her husband John, and Melissa and two grandchildren; and their two children Helen and Kilian Charles. He is also survived by his older brother Eugene.

David Johnson thanks Chuck's wife Maria and his colleagues at GE, Steve Duclos, James Vartuli, and Curtis Johnson for their help in writing this tribute.

BY MARIA GRESKOVICH
SUBMITTED BY THE NAE HOME SECRETARY

Chuck was the love of my life. He was a loving father, playing with his three children when they were young and later tutoring them all in math and science. He was always patient and understanding with them and me.

He was the life of any party, including his wife's yearly family reunion at the beach. He taught everyone how to play Bocci and Cinch, games he learned from his Italian grandparents. Then he showed everyone how to ride the waves, catch fish and crabs.

He was a man of many talents — an excellent fly fisherman, basketball player, and golfer. He enjoyed all these sports until the month before he died. He loved to eat, laugh, and tell stories.

Because he attended Pennsylvania State University on a scholarship, it seemed fitting to start an endowed scholarship in his name in Ceramic Science. He loved to share his passions and teach others and this continues that philosophy.

We miss his positive attitude, his passion for life, and his loving presence.

A quote from our youngest daughter from a poem she wrote for him on his last birthday:

Without you I wouldn't know the meaning
Of what a truly "Good Man" is
Of what a classic "role-model" is
And that heroes really do exist.