

Wladyslaw Walukiewicz (1946-2022)



Dr. Wladyslaw (Wladek) Walukiewicz passed away peacefully in the early morning of November 9, 2022, surrounded by his three children and Jolanta, his wife of 50 years.

Dr. Walukiewicz was born in Poland on February 21, 1946. He attended the Physics Department of Warsaw University, received his master's degree in solid state physics in 1971 and started working at the Institute of Physics of the Polish Academy of Sciences in Warsaw, where he earned his PhD in 1974. He obtained a Dr Sci (habilitation) in 1979. Although a theorist by training, he interacted closely with experimentalists from the very beginning of his scientific career, providing insightful methodology to develop a deep understanding of experimental data. Early in his career, he became interested in the physics of defects and electron recombination in semiconductors, an area of research that became a focus of his scientific activity.

In 1976, Dr. Walukiewicz was invited to work at the National Magnet Laboratory in Boston, and after working there for nine months, he began to collaborate with Prof. Harry Gatos at MIT. Dr. Walukiewicz accepted a second invitation from MIT and came to the US as a visiting scientist for three years, relocating permanently to the USA in 1983. In October of 1984, Dr. Walukiewicz joined the Electronic Materials research group at the Lawrence Berkeley National Laboratory upon invitation by program leader Prof. Eugene Haller, where he worked until his retirement in 2020. In addition, from 2017 to his retirement, he was also appointed an Adjunct Professor in the Department of Materials Science and Engineering at the University of California, Berkeley, and participated in the Singapore-Berkeley Research Initiative for Sustainable Energy.

Throughout his career, Dr. Walukiewicz was active in developing universal models of defect behavior in semiconductors in order to bridge our fundamental understanding of materials with device performance. In these fields, he made several important contributions, including the concept of Fermi level stabilization energy, which explained the amphoteric behavior of native defects and the resultant doping limit of wide-bandgap semiconductors; the band anticrossing model, which explained the extraordinary energy bandgap bowing in dilute semiconductor alloy and inspired the exploration of a new class intermediate band solar cell; narrow bandgap nitrides; defects in ferromagnetic semiconductors; mobility analysis in two-dimensional electron gases; and, in his latest years, defects and electron transport in perovskite semiconductors.

Dr. Walukiewicz was first and foremost devoted to his family. He was also an avid skier and runner. At conferences he would often be seen running; he had the goal of running the equivalent of the circumference of the Earth, which he achieved already some years ago. His colleagues remember him as a world-class scientist, a supportive colleague, a caring mentor, a scholar with creativity and integrity, and a friend with love and humor. Through his devotion and joy for science, Dr. Walukiewicz has enlightened and inspired generations of researchers and students at Berkeley and world-wide. In his final days when he became too weak to type, he recruited his children to record his thoughts on perovskites and superconductors, impressing them with his capability to recall citations and findings from the literature. His wife has observed a long time ago that he understood electrons like they were his friends, and they truly were.

Dr. Walukiewicz is fondly remembered and greatly missed.