



In remembrance: John B. Goodenough

Nobel laureate, MRS Von Hippel Award recipient

Professor John Bannister Goodenough passed away June 25, 2023 at the age of 100 in Austin, Texas. He was predeceased by his wife, Irene.

John received his undergraduate education from Yale University (BS 1944), which was interrupted by service in the US Army as a meteorologist in the farthest north point of the state of Maine to guide planes over the Atlantic Ocean. He was selected as a returning officer to study physics at The University of Chicago under Professor Clarence Zener (MS degree in 1951 and PhD degree in 1952). In 1952, he married Irene Wiseman.

During a distinguished career, John worked first at the Lincoln Laboratory of the Massachusetts Institute of Technology (1952–1976) initially on magnetic oxides, and then on materials for batteries. The latter became out of the scope of the laboratory's mission, so he decided to rejoin an academic department, as the Head of the Inorganic Chemistry Laboratory of the University of Oxford in England. He continued his studies on magnetism and battery materials there. With forced retirement on the horizon, he left Oxford in 1986 at the age of 64

to accept an endowed chair at The University of Texas at Austin where he remained an active researcher until his death.

John gained international recognition in two areas of materials: magnetism of solids and materials for lithium batteries. In the former, he was also able to formulate the rules for magnetic interactions in solids based on crystal structure and chemical bonding. These are known as the Goodenough–Kanamori rules and are described in his well-accepted textbook, *Magnetism and the Chemical Bond*, published in 1963. He continued working on magnetism throughout his life. In the area of energy, John is best known for his discovery at Oxford of the electrochemical behavior of lithium cobalt oxide, a material he was initially interested in because of its magnetic properties. It became the cathode of the first commercially successful Li-ion battery (SONY), and is still used today in phones and computers. Back in Texas, his group discovered a second cathode, lithium iron phosphate, that has also been extensively commercialized.

John was an inspirational mentor to numerous scientists, including Michael Thackeray, Arumugam Manthiram, and Peter G. Bruce who are now leaders in the battery community. I worked alongside him in the US Department of Energy Battery500 Consortium until the end, and numerous colleagues were able to be with him in Austin for his 100th birthday celebration. His infectious laugh is known to all. John was also a man of faith and he described his journey in his book, *Witness to Grace* (2008). It was a copy of this book that John gave to the Nobel Prize Museum display to exemplify his life's work.

John received numerous honors and awards, including the National Medal of Science, the Copley Medal, the Enrico Fermi Award, the Japan Prize, the Charles Stark Draper Prize for Engineering, and the MRS Von Hippel Award; they culminated in the Nobel Prize in Chemistry in 2019. The citation read: "They have laid the foundation of a wireless, fossil fuel-free society, and are of the greatest benefit to humankind."

Contributed by M. Stanley Whittingham.

2019 Nobel Prize in Chemistry with John B. Goodenough and Akira Yoshino.

MRS MOVERS & SHAKERS

Do you have an announcement about yourself or a colleague that you'd like to share with the Materials Research Society and materials communities? We will publish a selection of these in upcoming issues of *MRS Bulletin*.

Send your news to Bulletin@mrs.org