

## **Joseph Helszajn OBE FEng FRSE**

25 April 1934 – 11 October 2019

Professor Helszajn will be remembered as an electrical engineer of great distinction and an internationally recognised authority in the field of microwave science. Through a lifetime of achievement, he attained global pre-eminence in this field as a highly innovative scientist, engineer and educator. He leaves a legacy of a comprehensive series of major engineering textbooks that alongside his sustained writings, experimental works and consultancies have advanced the principles of microwave engineering and influenced a generation of academic and industrial engineers in his discipline.

Professor Helszajn is regarded as a world leader in the field of non-reciprocal microwave devices. In a career that spanned over six decades, he pioneered technologies that contributed to many industry firsts in advancing the science of satellite communications, telecommunications and radar. Of specific note was his influential work on junction circulators which are key components used in the control of high-power signals within microwave transmitters and receivers.

Professor Helszajn was born in Brussels, Belgium in 1934 and came to England in 1946. A chance conversation at school encouraged him to take a course in radio engineering at what is now the University of North London. He then went on to do National Service in the Royal Air Force (1955-1957) where he was introduced to radar technology, an encounter which was to shape his early career. In 1957, he joined A.C. Cossor, a leading UK electronics and defence business (later acquired by Raytheon).

Several years later, he and his wife, Ruth Mathilde, emigrated to North America, where he became a significant contributor to the dynamic and rapidly expanding microwave industry. During this period he worked for several major technology businesses, first with Marconi in Montreal, Canada and subsequently for a series of businesses based in the emerging technology hubs of Silicon Valley and Cambridge, Massachusetts including the radio pioneers, Raytheon and Sylvania Electric (now part of Verizon). In this period, he also completed a Masters degree in Electrical Engineering at Santa Clara University, California, before being invited by the renowned engineer Professor Peter Clarricoats to return to the UK and begin work on a PhD at the University of Leeds in 1966.

After completing his PhD in 1969, Professor Helszajn moved to Scotland to take up a position with Microwave Electronics Systems Ltd in Edinburgh (a technology company later acquired by the US giant, Honeywell). He joined the Department of Electrical and Electronic Engineering at Heriot-Watt University in 1971 at which time he was instrumental in laying the foundation of what is now the largest research group of its kind in Scotland. In 1976 Professor Helszajn was honoured with the first DSc awarded by the University. He was appointed to a personal Chair in Microwave Engineering in 1982 and held the title of Distinguished Visiting Professor at Arizona State University in 1987. He similarly enjoyed a long collaboration with the University of Cantabria in Santander, Spain and latterly also had a close relationship with Napier University after his retirement from Heriot-Watt University.

In 2007, Heriot-Watt University awarded Professor Helszajn the Honorary degree of Doctor of the University in recognition of his prodigious lifetime achievement in the science of microwave engineering. During his career he had over two hundred papers published in leading British and American journals in collaboration with more than fifty colleagues in industry and academia. He consulted widely for large corporations and SMEs on both sides of the Atlantic including Ferranti and Filtronic in the UK and Boeing, Com Dev, Apollo Microwave and UTE Microwave in North America. His long-standing collaboration with Apollo Microwave in Montreal was recognized by his appointment as Honorary Vice-President of Research and he continued to work with them until very recently. These collaborations resulted in many patents. Professor Helszajn was the author of thirteen major engineering textbooks on microwave engineering, the most recent published in 2019, with several being translated into different languages. He remained Emeritus Professor with Heriot-Watt University and active on his research engagements until the end of his life.

Professor Helszajn held many distinctions. He was a Fellow of the Royal Academy of Engineering (FEng), the Institution of Engineering and Technology (FIET), the Institute of Electrical and

Electronic Engineers (FIEEE), the City and Guilds Institute (FGCI) and the Royal Society of Edinburgh (FRSE). In 1995, he joined a highly distinguished list of eminent engineers when he was awarded the JJ Thomson Medal for outstanding achievements in electronics from the Institution of Electrical Engineers (now the Institution of Engineering and Technology) and in 1997 he was awarded an OBE in the Queen's Birthday Honours List. In addition to this, he was awarded a Doctorate of Engineering degree (DEng) from Leeds University in 1995 and an Honorary Doctorate of Engineering (HonDEng) from Napier University for his lifelong work in 2004. His standing was reflected by his position as one of only two honorary editors over eighteen years of the leading Journal Proceedings of the Institution of Electrical Engineers on Microwaves, Antennas and Propagation as well as his membership on the editorial board of its kindred USA Journal.

Professor Helszajn will be greatly missed by his family as well as his many friends, colleagues and students across the world whom he mentored, inspired and encouraged throughout his career. His death on 11 October 2019, after a brief illness, led to moving tributes from his colleagues all over the world. His legacy will remain strong through his numerous achievements, monographs and articles as well as the many students and engineers he has educated. As for colleagues working on research and education in the field of microwave engineering at Heriot Watt University, we feel particularly privileged for his legacy and working in the environment nurtured by Professor Joseph Helszajn.

He is survived by his wife, their son, two daughters and six grandchildren.

**Professor George Goussetis,  
Head of Institute for Sensors Signals and Systems**

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