



Grant R. Eckert

ERNST R. G. ECKERT

1904–2004

Elected in 1970

“For contributions to the solution of basic problems in heat and mass transfer.”

BY EMIL PFENDER

ERNST R.G. ECKERT, Regents’ Professor Emeritus at the University of Minnesota, died on July 8, 2004, less than three months before his 100th birthday. On September 13, 2004, the date of his 100th birthday, his colleagues and friends at the University of Minnesota organized the Ernst R.G. Eckert 100th Anniversary Symposium on Heat Transfer: A Career That Changed a Field. The symposium was attended by national and international leaders in the field from academia and industry.

Ernst Eckert was born September 13, 1904, in Prague, Czechoslovakia, where he spent his youth and attended the German Institute of Technology, earning the degree of Diplom Ingenieur (bachelor of science) in 1927 and Doctor of Ingenieurwissenschaften (doctor of engineering science) in 1931. He stayed on as an assistant at the institute until 1935, when he moved to Danzig, where Ernst Schmidt, professor and director of the engine laboratory, was conducting research into thermal radiation from solids and gases. Dr. Eckert pursued his growing interest in this field and earned his Dr. Habil. (doctorate) in thermal radiation in 1938. Professor Schmidt moved to Braunschweig, Germany, in 1937, and, after finishing his degree, Eckert followed him. There he assumed the positions of docent (associate professor) at the Institute of Technology and section chief at the newly established Aeronautical Research Institute.

In 1943, Eckert left his academic post at the Institute of Technology in Braunschweig (but retained his position at the Aeronautical Research Institute) and returned to the German Institute of Technology in Prague as professor at the Institute of Thermodynamics. He continued to hold both positions until the end of World War II.

Eckert came to the United States in 1945 as part of Action Paperclip. Action Paperclip was initiated by the U.S. Armed Forces in 1945 in Germany after the end of the second World War. Leading German scientists and engineers in aeronautics and related fields were invited to come to the United States with their families and work under contract for the U.S. government. From 1945 to 1949, he was consultant to the Power Plant Laboratory at Wright-Patterson Air Force Base in Dayton, Ohio. In 1949, he moved to Cleveland as a consultant to the Compressor and Turbine Division, Lewis Flight Propulsion Laboratory, National Advisory Committee for Aeronautics. In 1951, he returned to the academic life of teaching, research, and writing as full professor of mechanical engineering at the University of Minnesota-Twin Cities, a position he chose from among several invitations across the United States. When he joined the faculty at Minnesota, he founded the Heat Transfer Laboratory, and, in 1955, he was named director of the laboratory and the Thermodynamics and Heat Transfer Division, positions he held until he retired in 1973.

A man of vision and imagination, Eckert inspired his colleagues and students, both graduate and undergraduate, to participate in an environment distinguished for its breadth, versatility, and excellence in heat-transfer research. During his time in Minnesota, he led outstanding research on a wide variety of topics, from the recovery-factor method of determining gas thermal conductivity coefficients to convective heat transfer in circular and noncircular passages, mass-transfer cooling, thermal radiation, film cooling, interferometric studies of free convection, mass transfer in flowing suspensions, transport-property measurements, mass transfer in bioengineering, heat and mass transfer in fires, and the heat-transfer aspects of solar energy

and power systems. After his retirement, he continued to conduct research, consult, write, and advise graduate students.

Dr. Eckert had an enormous impact on the science of heat transfer and related areas of application for almost 50 years. He began his career with pioneering research in the field of radiation heat transfer and continued to pioneer numerous other aspects of heat transfer. His work was distinguished by the development of practical applications (to steam generators, turbines, re-entry and high-speed flight, and solar energy), as well as breakthrough contributions to the understanding of fundamental mechanisms of heat transfer.

In recognition of his contributions to heat transfer in high-velocity flows, the dimensionless quantity that measures the temperature increase from adiabatic compression was named the Eckert number. In 1970, he was elected to the National Academy of Engineering (NAE), and in 1995 he received the NAE Founders Award with the following citation: "The recognized international leader in the field of heat and mass transfer for over 50 years, he has led several generations of researchers and practitioners to advanced knowledge of fundamental physical processes and important applications through his teaching, his books, and his archival journal publications."

In 1965, in recognition of his outstanding teaching, he received the University of Minnesota Institute of Technology Distinguished Teaching Award and the Western Electric Fund Award for Excellence in Instruction of Engineering Students. In 1966, in honor of his many accomplishments, the University of Minnesota bestowed its highest honor on Dr. Eckert by appointing him Regents Professor of Mechanical Engineering. This title is conferred in recognition of academic distinction, judged on the basis of the scope and quality of scholarly contributions, quality of teaching, and contributions to the public good.

Eckert was the first recipient of the Max Jakob Medal and Award (1961) and the recipient of a gold medal from the French Institute for Energy and Fuel/Institute of Energy and Combustion in Paris. As a reflection of the esteem in which he was held by the international community of scientists in the field of heat

transfer, he was awarded seven honorary doctorates from universities in the United States and Europe. These are only a few of the many honors he received over the years.

Dr. Eckert was appointed by President Richard M. Nixon to the National Fire Prevention and Control Commission in 1970, and he was technical director of the University of Minnesota/Honeywell Solar Power Study for the National Science Foundation. He was the author of more than 500 scientific papers and two textbooks that have been translated into Russian, Iranian, and Chinese.

Dr. Eckert believed that cooperation not only advances the cause of science, but also contributes to international understanding, and he tirelessly promoted cooperation among heat-transfer scientists of all nations. He was a founder, and chairman, of the Editorial Advisory Board of the *International Journal of Heat and Mass Transfer*; *International Journal of Heat and Mass Transfer*; co-chair of the Editorial Advisory Board of *Heat Transfer-Soviet Research* and *Heat Transfer-Japanese Research*; co-editor of *Energy Developments in Japan*; and a member of the Editorial Board of *Wärme-und Stoffübertragung*.

Dr. Eckert set high standards and encouraged excellence, not only in technical and scientific matters, but also in personal conduct and relationships. He gave generously of his time to students and colleagues, and his gentle manners, quiet good humor, and friendliness called forth the best in everyone he knew. It was an honor and a privilege to have known and worked with him, and his memory is a continuing source of inspiration.

Dr. Eckert is survived by his four children, Christa Eckert-Kohler, Elke Eckert, Karin Winter, and Dieter Eckert.

