



Contents lists available at ScienceDirect

International Journal of Heat and Mass Transfer

journal homepage: www.elsevier.com/locate/hmt

In Memoriam Prof. James Vere Beck (1930-2022)



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Prof. James V. (Jim) Beck passed from this life on July 28, 2022. He was beloved and respected as a researcher in parameter estimation, heat conduction, and inverse problems.

Jim was uncommonly personable and approachable. He welcomed inquiries from new acquaintances and delighted in sitting down to discuss their research problem, often sketching out those issues on the back of a napkin. "Let's talk about your research problem", he might say to a new questioner.

He projected an incredible ability to form groups and connect researchers to one another. This talent was especially directed toward young practitioners with his encouragement to them to become involved in research groups and meetings. Jim projected a delightfully positive attitude about life. "Things have a way of working out" was a frequent expression he used. When approaching an administrator or potential sponsor for funds, Jim often said "Let's give them a chance to help us."

Many of his technical contributions represent simple, direct approaches to complex problems. "Start simple" was one of his maxims. As such, he developed a numbering system for various combinations of boundary conditions for heat conduction in three primary geometries. The start of this numbering system was quite simple but has become quite complex through years of contributions from researchers who have been assimilated into the Beck consortium. In his retirement years, his research pace continued unabated and he enjoyed weekly one-hour phone calls with colleagues in multiple time zones in order to discuss various research topics. He was a master at building teams and drawing new people into research projects. He chose topics that were very mathematical and therefore he reached out to practitioners in departments of mathematics and statistics. "I need a mathematician" was one of his frequent comments.

James Vere Beck was born May 18, 1930, in Cambridge, MA. He grew up in the Boston area and helped with his father's oil and ice company. When he was only 18 years old, and he took over the business to provide for his mother and sister after his father passed away. After about four years, he entered Tufts University and earned his first degree at age 26 in 1956. He earned a Master's degree from MIT a year later (1957) and began work at AVCO Research, where many of the projects there directed his interests into parameter estimation and inverse heat conduction. It was at AVCO that he worked alongside Charles St. Clair, who later became Department Head of Mechanical Engineering at Michigan State University (MSU) and recruited Jim to move to East Lansing as an instructor and Ph.D. student. After earning his degree in 1964, Jim was appointed as Assistant Professor, and remained on the faculty at MSU until his retirement in 1998, at which time he was named Professor Emeritus.

Professor Beck received three sabbatical leaves of absence from MSU during his tenure, and each corresponded to the publication of one of his textbooks. He spent an extended leave of a year and a half at Sandia National Laboratories, Albuquerque, NM, between 1977 and 1978, after publication of his first book *Parameter Estimation in Engineering and Science*.

Professor Beck's leadership drove development of an international community in the field of inverse problems. He inaugurated the Inverse Problems in Engineering Seminars (IPES) at MSU in 1988, and these informal meetings continue as the Inverse Problems Symposium (IPS) and attract scholars from around the world. A collaboration with Jean-Pierre Bardon started in 1982 and a 1993 meeting at ISITEM (Institut des Sciences de l'Ingénieur en Thermique-Energétique et Matériaux) within the University of Nantes resulted in the creation of the French group METTI (Métrologie Thermique et Techniques Inverses). In 1990, Professor Beck led a delegation to the First International Conference on Inverse Problems in Suzdal, USSR. In 1992, Professor Beck organized the visit of a delegation of Russian scientists to the USA as participants of his IPES and the 1st American-Russian workshop on Inverse Problems. Four years later, he jointly organized the second conference in this series in St. Petersburg, Russia with O.M. Alifanov of the Moscow Aviation Institute. The workshop fostered collaborations between specialists in the field of inverse phenomena from many countries.

Professor Beck has authored more than 170 archival journal articles and five book chapters, as well as countless technical presentations. Many of his publications are collaborations made possi-

ble by his lifelong search for people who share his enthusiasm for discovery. Professor Beck is the primary author of three graduate level textbooks: *Parameter Estimation in Engineering and Science*, with K.J. Arnold (Wiley, 1977); *Inverse Heat Conduction: Ill-posed Problems*, with Ben Blackwell and Charles R. St. Clair, Jr. (Wiley, 1985); *Heat Conduction Using Green's Functions*, with K.D. Cole, A. Haji-Sheikh, and B. Litkouhi (Hemisphere, 1992). Also, he is the secondary author of the second edition of *Heat Conduction Using Green's Functions* book (Cole, Beck, Haji-Sheikh, and Litkouhi, Taylor & Francis, CRC Press, 2010), and is an author of the forthcoming publication of the second edition of *Inverse Heat Conduction: Ill-posed Problems* with K. A. Woodbury, H. Najafi, and F. de Monte (Wiley, 2023).

Active in the Heat Transfer Division of the American Society of Mechanical Engineers, Professor Beck has been a Fellow of ASME since 1988. He served as Associate Technical Editor for the ASME *Journal of Heat Transfer* and as Associate Editor for the journal *Inverse Problems in Science and Engineering*. Professor Beck was awarded the ASME Heat Transfer Memorial Award in 1998, and later served as the Chair of the Heat Transfer Division's Honors and Awards Committee. Other awards include the MSU Distinguished Faculty Award (1987) and the Tufts University Department of Mechanical Engineering Award for Outstanding Achievement in Mechanical Engineering Practice (1991).

The Sixth International Conference on Inverse Problems in Samara, Russia (May 2–7, 2010) was dedicated to Professor James V. Beck's 80th birthday. The 10th International Conference on Inverse Problems in Engineering (ICIPE 2022) in Francavilla al Mare (Chieti), Italy (May 15–19, 2022), coincided with his 92nd birthday and was dedicated to him. Prof. Beck was preceded in death by his parents, his wife Barbara and his sister Phyllis. He is survived by his two children, four grandchildren and one great-grandchild.

Professor James V. Beck will always be remembered as an outstanding teacher, researcher, and mentor with an highly admirable character who touched many lives during his lifetime and left everlasting contributions to the science and engineering. He will be missed by his many colleagues, students and friends.

Oleg Alifanov	Moscow Aviation Institute
Jean-Pierre Bardon	Nantes University, France
Ben Blackwell	Sandia National Lab
Ping Cheng	Shanghai Jiaotong University
Marcelo J Colaco	Federal University of Rio de Janeiro
Kevin Cole	University of Nebraska
Kyle Daun	University of Waterloo
Filippo de Monte	University of L'Aquila, Italy
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