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2008 Max Jakob Memorial Award

Presented to

Suhas V. Patankar, Ph.D.

Lecture Title: "Airflow and Cooling in a Data Center"

2009 ASME Summer Heat Transfer Conference
Co-Located with InterPACK and Energy Sustainability Conferences

Tuesday, July 21st, 2009
5:30 pm to 7:00 pm
Westin St. Francis
San Francisco, California USA

Suhas V. Patankar

Suhas V. Patankar was born in Pune, India. He received his B.E. degree in mechanical engineering in 1962 from University of Pune, his M.Tech. degree in 1964 from the Indian Institute of Technology, Mumbai, and his Ph.D. degree in 1967 from University of London. He did his Ph.D. research under the guidance of Professor D. Brian Spalding at Imperial College, London. The subject of the Ph.D. thesis was a general calculation procedure for two-dimensional boundary layers. The Ph.D. thesis was published in book form and the "Patankar-Spalding method" described in the book became very widely used all over the world. The availability of the method (and the corresponding computer program) spurred a large variety of applications and led to a vigorous development of mathematical models for turbulence and combustion.

After completing his Ph.D. degree, Patankar worked as an assistant professor at the Indian Institute of Technology, Kanpur from 1967 to 1970 and then returned to Imperial College, London for further research work with Professor Spalding from 1971–73. During this period, the research focus was initially on the development of a calculation method for three-dimensional boundary layers. The method was subsequently generalized to three-dimensional recirculating ("elliptic") flows. The resulting SIMPLE algorithm became very widely used and led to many applications and improved versions of the algorithm. It is true to say that, even today, a significant part of the computational fluid dynamics activity in the world is based on some variant of the SIMPLE algorithm. (The 1972 publication of this work was the basis of the 1997 Classic Paper Award given to Patankar and Spalding.)

In 1973, Professor Patankar joined the University of Waterloo in Canada for about two years and then became a faculty member at the University of Minnesota in the Department of Mechanical Engineering. During his 25-year career at the University of Minnesota (1975–2000), he conducted further research, taught undergraduate and graduate courses, and advised graduate students. In addition to his fundamental work on computational techniques for fluid flow and heat transfer, he worked on mathematical models for turbulence, combustion, chemical vapor deposition, and metallurgical processes. He used computational simulation for a large variety of practical applications including electronics cooling, steam generators, coal combustion, fiber-matrix composites, gas turbines, reciprocating compressors, fire spread, grain dryers, ingot casting, and crystal growth.

Patankar is known for his skillful teaching and lucid writing. His 1980 book *Numerical Heat transfer and Fluid Flow* is extremely popular and remains, to this day, the most respected work on this subject. The book has been translated into Japanese, Chinese, Russian, Korean, and Persian. In addition to his teaching at the University of Minnesota, Professor Patankar taught several short courses for practicing engineers. These short courses have been given over 50 times in the USA and also presented in Canada, France, Norway, Brazil, Taiwan, Czech Republic, India, and Australia.

In 1987, Dr. Patankar founded Innovative Research, Inc., a company providing software products and consulting services in the area of fluid flow, heat transfer, and associated processes.

His numerous awards for teaching and research include: the 1983 George Taylor Distinguished Teaching Award, the 1989–90 Morse-Alumni Award for Outstanding Contributions to Undergraduate Education, the 1991 ASME Heat Transfer Memorial Award, and the 1997 Classic Paper Award.

CITATION

The Max Jakob Memorial Award is presented to Professor Suhas V. Patankar, for a profound and enduring impact on the theory and practice of computational fluid dynamics and heat transfer. He has made significant contributions to the development and application of computational techniques to flow and heat transfer problems in industry. Further, he has successfully taught and communicated these techniques to a large number of students, practicing engineers, and researchers throughout the world through his articles, books, short courses, and lectures.

John C. Chen, Ph.D.
Department of Chemical Engineering
Lehigh University

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MAX JAKOB MEMORIAL AWARD

The Max Jakob Memorial Award is bestowed in recognition of eminent achievement and or distinguished service in the area of heat transfer. Made annually, without regard to society affiliation or nationality, the award consists of a bronze plaque, an honorarium, and an engrossed certificate. The award was established in 1961 by the ASME Heat Transfer Division in honor of Max Jakob, a pioneer in the science of heat transmission, commemorating his outstanding contributions as a research worker, educator and author. In 1962, AICHE joined in the award, which is administered by a board of seven, three from each Society, and the past chair.

MAX JAKOB 1879 – 1955

Scientist, engineer, educator – Max Jakob belongs to that group of remarkable individuals whose talents and achievements earned German science a position of eminence in the latter part of the 19th century and the early part of the 20th century. Although his accomplishments in his native country had already given him worldwide recognition, they were followed by a second distinguished career in the United States.

Max Jakob was born on July 20, 1879 in Ludwigshaven, Germany. After completing the gymnasium, he attended the Technische Hochschüle München where he received an Electrical Engineer degree in 1902, a Diplom-Ingenieur in Applied Physics degree in 1903, and the degree of Doktor Ingenieur in 1904. In 1910 he embarked on a 25 year career at the Physikalisch-Technische Reichsanstalt, during which he founded and directed applied thermodynamics, heat transfer, and fluid flow laboratories.

He wrote over 200 technical papers, and was a prolific source of critical reviews, articles, and discussions. When he left Germany in 1936 fleeing Nazi persecution, he had already gained great stature as a scientist-engineer.

After a one-year lecture tour sponsored by ASME, Dr. Jakob became research professor of Mechanical Engineering at Illinois Institute of Technology (IIT) and consultant in Heat Research at the Armour Research Foundation. In 1942, he founded and became the first director of IIT's Heat Transfer Laboratory.

He was active in research, teaching, consulting, and writing, and became one of America's educational and scientific leaders. His books, an elementary textbook and a two-volume treatise on heat transfer, have had a profound influence on education and research. His formal honors include an Honorary Degree of Doctor of Engineering from Purdue University in 1950, and the Worcester Reed Warner Medal of ASME in 1952.

His colleagues and his students loved and admired him for his warm personality, subtle wit, and rare humility of spirit. When he died on January 4, 1955, they had lost a great friend, and humankind had lost one of its truly outstanding members.