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 embossed 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.

Max Jakob Memorial Award Board of Award (2010)

Arthur E. Bergles, Chair (AIChE); Ping Cheng, Vice Chair (ASME); Ashley F. Emery, Past Chair (ASME); Kenneth J. Bell, Member (AIChE); Virendra K. Mathur, Member (AIChE); M. Michael Yovanovich, Member (ASME)

ASME
SETTING THE STANDARD

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2010 Max Jakob Memorial Award

Presented to: **Amir Faghri, Ph.D.**

Lecture title: **Advances and Opportunities in Passive Micro and Miniature Technologies for Energy and Thermal Systems**

November 16, 2011
11:00 a.m. – Noon

ASME 2011 International Mechanical Engineering Congress & Exposition

November 11–17, 2011
Hyatt Regency Denver at Colorado Convention Center
Denver, Colorado, USA

www.asmeconferences.org/congress2011

Amir Faghri

AMIR FAGHRI received his M.S. and Ph.D. degrees from the University of California at Berkeley (1974, 1976), and a B.S with highest honors from Oregon State University (1973). Professor Faghri joined the University of Connecticut (UConn) in 1994 and served as head of the Mechanical Engineering Department from 1994–1998, and the dean of the School of Engineering from 1998–2006. During his tenure as dean, Professor Faghri successfully attracted corporate and alumni support to establish 17 endowed professorships, including 11 chair professorships. He increased total enrollment by 106%, significantly raised the number of valedictorians and salutatorians admitted per year to the School of Engineering, increased the number of merit scholarships by approximately 200%, and added three new buildings/facilities. He also doubled the number of undergraduate degree programs. Professor Faghri was the founder of the Connecticut Global Fuel Cell Center (recently renamed as the Center for Clean Energy Engineering) that was established at the University of Connecticut with significant investment derived from private, state, and federal agencies.

Professor Faghri has authored four major books, more than 300 archival technical publications (including 200 journal papers), and holds eight U.S. patents. He has served as a principal investigator conducting research in the area of thermal management and multiphase transport phenomena for applications ranging from advanced cooling systems to alternative energy systems, including heat pipes, fuel cells, solar energy systems, and thermal energy storage devices. Professor Faghri is presently serving on the editorial board of eight scientific journals. He has received many honors and awards, including the American Institute of Aeronautics & Astronautics (AIAA) Thermophysics Award in 1988, the American Society of Mechanical Engineers (ASME) Heat Transfer Memorial Award in 1988 and the ASME James Harry Potter Gold Medal in 2005. He has served as a consultant to several major research centers and corporations, including Los Alamos and Oak Ridge national laboratories, Exxon Mobil and Intel Corporation.

Professor Faghri's most profound contributions relate to his development of the fundamental theories that have enabled today's widespread deployment of macro- and micro-two-phase energy systems including heat pipes, heat exchangers and fuel cells. He was the first to perform detailed heat and mass transfer analysis of heat pipes that documented the parameters upon which their efficient operation is based. His research showed, for the first time, the promise of heat pipes as integral cooling devices for microelectronic equipment. Heat pipes are now an almost routine technology in laptop computers due to his efforts. His signature work, *Heat Pipe Science and Technology,* is internationally acclaimed for its depth and breadth of coverage, and ranks as the most widely cited book on the subject of heat pipes.

Professor Faghri's other significant technical contributions are in the areas of thin film liquids, heat and mass transfer, solidification and melting, evaporation and condensation, microgravity convection, and liquid jet impingement. His early work in the 1970s characterized the role of interfacial waves on thin film evaporation and condensation and is now routinely cited in the literature on the topic. In the 1980s, he unraveled complex problems, including forced convection in the presence of phase change materials for thermal energy storage in outer space. This break-through led to rational design of these cooling systems for NASA and the U.S. Air Force. In the 1990s, he developed new high heat flux miniature/micro heat pipes for commercial cooling of laptop computer chips. Over the last decade, he has focused his efforts on fundamental research related to advanced micro and macro energy systems including fuel cells, heat pipes and energy storage systems.

Citation

The Max Jakob Memorial Award is presented to Amir Faghri for extensive, profound and pioneering work in a wide variety of basic and applied problems in thermal fluids science and engineering and his distinguished leadership in engineering education as a teacher, mentor, researcher and administrator. He has made significant fundamental contributions in the field of transport phenomena in multiphase and energy systems, with applications in heat pipes, heat exchangers, energy storage, electronics cooling and fuel cells.

Abstract

The 21st Century will see the development of a wide range of active miniaturized energy devices with applications in energy management and power sources, electronic cooling, energy storage and bioengineering. Although these active devices are effective, they are often cumbersome and inefficient considering the auxiliary supporting devices such as pumps, fans, and other moving parts they require for operation. A more efficient and novel approach involves use of passive small energy and thermal devices with no moving parts. Advances and opportunities in several major research thrusts for passive micro and miniature technologies for energy and thermal systems, including heat pipes, fuel cells, energy storage devices and solar systems, will be presented.

Previous Recipients

1961 Ernest R. Eckert, U.S.A.
1962 Llewellyn M.K. Boelter, U.S.A.
1963 William H. McAdams, U.S.A
1964 Ernest Schmidt, Germany
1965 Hoyt C. Hottel, U.S.A.
1966 Sir Owen Saunders, U.K.
1967 Thomas B. Drew, U.S.A.
1968 Shiro Nukiyama, Japan
1969 S.S. Kutateladze, U.S.S.R.
1970 Warren M. Rohsenow, U.S.A.
1971 James W. Westwater, U.S.A.
1972 Karl A. Gardner, U.S.A.
1973 Ulrich Grigull, Germany
1974 Peter Grassmann, Switzerland
1975 Robert G. Deissler, U.S.A.
1976 Ephraim M. Sparrow, U.S.A.
1977 D. Brian Spalding, U.K.
1978 Niichi Nishiwaki, Japan
1979 Stuart W. Churchill, U.S.A.
1980 Ralph A. Seban, U.S.A.
1981 Chang-Lin Tien, U.S.A.
1982 Simon Ostrach, U.S.A.
1983 Bei Tse Chao, U.S.A.
1984 Alexander Louis London, U.S.A.
1985 Frank Kreith, U.S.A.
1986 Raymond Viskanta, U.S.A.
1987 S. George Bankoff, U.S.A.
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1989 James P. Hartnett, U.S.A.
1990 Richard J. Goldstein, U.S.A.
1991 Franz X. Mayinger, Germany
1992 William M. Kays, U.S.A.
1993 Benjamin Gebhart, U.S.A.
1994 Geoffrey F. Hewitt, U.K.
1995 Arthur E. Bergles, U.S.A.
1996 Robert Siegel, U.S.A.
1997 John R. Howell, U.S.A.
1998 Alexander I. Leontiev, Russia
1999 Adrian Bejan, U.S.A.
2000 Vedat Arpaci, U.S.A.
2001 John C. Chen, U.S.A.
2002 Yogesh Jaluria, U.S.A.
2003 Kenneth J. Bell, U.S.A.
2004 Vijay K. Dhir, U.S.A.
2005 Ping Cheng, China
2006 Kwang-Tzu Yang, U.S.A.
2007 Wen-Jei Yang, U.S.A.
2008 Suhas Patankar, U.S.A.
2009 Ivan Catton, U.S.A.