

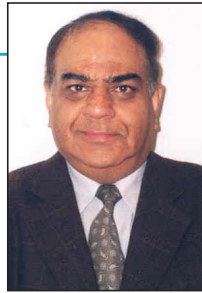


HEAT TRANSFER

FALL 2003

A.M. JACOBI, EDITOR

Past Chair's Remarks • YOGESH JALURIA



I am very happy to report to you that the ASME Heat Transfer Division has continued to contribute significantly to all activities and programs of interest to the members and has made several major strides over the past year. The Journal of Heat Transfer, with its bimonthly publication, continues to be a dominant force in heat transfer and has been attracting increasing numbers of contributions from around the world. Under the leadership of the Technical Editor, Dr. Vijay Dhir, it has remained a vital publication venue for research in thermal sciences and engineering and has also been quite profitable due its extensive circulation.

The Conferences organized by the Division also continue to be very successful. Growing numbers of panel discussions, invited papers and symposia have increased the attendance, particularly at the International Mechanical Engineering Congress and Exposition (IMECE). The last conference, held in November 2002 in New Orleans, attracted more than 500 abstracts. The papers presented at the congress resulted in 8 conference proceedings, edited by the HTD representative, Professor Yildiz Bayazitoglu. The AIAA/ASME Joint Thermal Engineering Conference, held in St. Louis in June 2002, with Professor Pinar Menguc as the HTD representative, was also well attended. In addition to these, HTD was actively involved in two major international conferences. The first one was the 12th International Heat Transfer Conference, held in Grenoble, France, in August 2002, with Professor A. Bar-Cohen as the Division representative on the International Scientific Committee and

Professor J.R. Lloyd as a delegate to the Assembly. The presence of the division was strong in terms of contributed papers, keynote presentations and session chairs. The second international conference was the 6th ASME/JSME Thermal Engineering Joint Conference, held in Hawaii in March 2003. With over 370 papers and many keynote presentations, it was a very successful conference due, in part, to the diligent efforts of the HTD representative, Professor Adrienne Lavine.

Despite the success in many of these conferences, the participation in the summer heat transfer conferences has declined somewhat in recent years. This decline has led the Division to explore other collaborations and arrangements, while trying to make the conference more attractive and to deliver the best value for the participants. The ASME Summer Meeting in Las Vegas in July 2003 has focused on improving the format and on reducing costs, whereas the 2004 meeting has formed collaborative ties with the Fluids Engineering Division of ASME, as well as with our traditional partner AIChE. With continued interest in such joint efforts, the future of the summer meeting appears to be on the right path.

The Division has also been active in awarding its members for quality work and service, through society awards like the Heat Transfer Memorial Award, the Max Jakob Memorial Award, which is given jointly with AIChE, the best and classic paper awards, and the dedicated service awards. A new award, known as

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the Bergles-Rohsenow Young Investigator Award in Heat Transfer has been established through the generosity of these two pioneers to encourage research in heat transfer, by recognizing young investigators for the quality of their research and for their commitment to the field of heat transfer. The award will be given annually by the Society to recognize a researcher who is under age 36 (on June 1 of the year he/she is nominated), and has received a Ph.D. or an equivalent degree in engineering. Individuals nominated must be committed to pursuing research in heat transfer, and must have demonstrated the potential to make significant contributions to this field. The areas of accomplishment may take the form of analytical/numerical methods, equipment/instrumentation, experimentation, or any other approach, which should lead to peer-reviewed publications in the field of heat transfer. Nominations may be sent to the HTD Honors and Awards

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Awards

2002 Max Jakob Award



John C. Chen, the Carl R. Anderson Professor of chemical engineering at Lehigh University in Bethlehem, PA, has received the 2001 Max Jakob Memorial

Award, the top international prize for achievements in heat transfer.

Chen received the award at the 12th International Heat Transfer Conference in Grenoble, France. At the conference, Chen gave a one-hour address titled "Surface Contacts—Significance for Multi-Phase Heat Transfer" and earned a standing ovation from 800 international delegates representing 43 countries.

Chen, a former dean of Lehigh's P.C. Rossin College of Engineering and Applied Science, gained renown in 1966 when he developed the "Chen Method" of predicting the rate at which heat must be transferred to liquid to make it boil. The method has become the standard for designing vapor-liquid boiling systems used in the chemical, power, refrigeration, petroleum, nuclear and gas industries. It has been cited hundreds of times in technical articles and textbooks.

Since that early discovery, Chen has continued to make seminal contributions to various aspects of heat transfer science and technology. In a study done in the mid-1990s for the Electric Power Research Institute, Chen concluded that new refrigerants with little or no ozone-depleting chlorine could perform as well in some heat-transfer tests as the chlorine-based refrigerants whose production has been banned.

Chen was praised by Jakob Award nominators not only for his research in boiling but also for his more recent work in several other areas of heat transfer.

"John Chen has been the pioneer and the unquestioned leader in the world on boiling heat transfer and other areas involving two-phase flow and heat transfer," said Raymond Viskanta, the W.F.M. Goss Distinguished Professor of Engineering at Purdue, who won the Jakob Award in 1986.

"John has published several seminal papers on radiative transfer in participating media, including prediction of absorption and scattering characteristics of particles. These papers are classical and continue to be cited 30 years after they were first published."

"Professor Chen's correlation for forced convective boiling published in 1966 is still used universally and must be implemented thousands of times every day in industrial design," wrote Geoff Hewitt, professor emeritus of chemical engineering at London's Imperial College of Science, Technology and Medicine, and a member of the Royal Society of London.

Arthur E. Bergles, the Clark and Crossan Professor of Engineering Emeritus in the department of mechanical engineering, aeronautical engineering and mechanics at Rensselaer Polytechnic Institute, said, "It is only fitting that Dr. Chen be given the Jakob Award for a lifetime of truly excellent work in, and conscientious service to, heat transfer.

"His careful experiments, profound physical interpretations, and useful correlations have contributed immensely to the theory and practice of boiling heat transfer, particularly convective boiling in tubes, dispersed-flow film boiling in tubes, and falling-film evaporation outside of tubes."

Jakob, a pioneer in the fields of thermodynamics, heat transfer, and fluid flow,

was born in Germany in 1879 and died in the U.S. in 1955. The recipient of the Jakob Award is chosen by committees representing the American Society of Mechanical Engineers (ASME) and the American Institute of Chemical Engineers (AIChE). Chen is a fellow in both organizations.

Chen's other awards include two top honors from Germany—the Alexander von Humboldt Senior Research Award and the Max Planck Research Prize. From AIChE, he has received the D.Q. Kern Award for research with practical impact, the Heat Transfer and Energy Conversion Division Award, and the Particle Technology Forum's Thomas Baron Award. From ASME, he has received the Melville Medal for archival literature.

Chen, who has taught undergraduate and graduate courses in chemical engineering and mechanical engineering throughout his 32-year career at Lehigh, has received the university's Hillman Award for excellence in teaching, scholarship and service, and the Libsch Award for distinction in research.

After experience in industry and national laboratory, Dr. Chen has devoted himself to teaching and research in academe. He has developed new courses at both undergraduate and graduate levels in area of transport phenomena, served as department chair and college dean, and graduated over 30 PhD and 40 MS students.

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2003-2004 Executive Committee at the HTD Summer Conference in Las Vegas, Nevada. From left to right: Russell Skocypec, Timothy Tong, Yogesh Jaluria, Yildiz Bayazitoglu, Michael Jensen. Rodney Douglass (not pictured).

He has over 200 referred publications. He has also been named as Eminent Engineer by Tau Beta Pi Honor Society, and is recipient of the Particle technology Forum's Thomas Baron Award. Dr. Chen is a Fellow of both ASME and AIChE. •

2001 Heat Transfer Memorial Awards

Je-Chin Han (Art), P.E., Sc.D., Marcus C. Easterling chair professor and director, Turbine Heat Transfer Laboratory, Texas A&M University, College Station, for research contributions in heat transfer relating to gas turbines, particularly experimentation and studies of rotating channel flows, cooling systems and high turbulent flows.

Massoud Kaviany (Science), Ph.D., professor, University of Michigan, Ann Arbor, for investigating heat transfer in porous media and compiling an extensive body of research results in the internationally recognized and widely-used book, "Principles of Heat Transfer in Porous Media."

Roop L. Mahajan (General), Ph.D., professor, University of Colorado, Boulder, for his successful experiments using artificial neural networks for thermal modeling and process control and other research that has advanced the knowledge and understanding of buoyancy induced flows, and transport phenomena in semiconductor manufacturing and high porosity metal foams. •

Professor Chang-Lin Tien

Professor Tien was a giant in the field of Heat Transfer. He made outstanding contributions in essentially every aspect of heat transfer and opened new avenues for research. Over the past four decades, his smile, humor, and presence have brightened every thermal science meeting around the world. It seems like yesterday when we celebrated his 60th birthday at Berkeley. He jokingly dismissed all the fuss over a "young guy". He was a friend, colleague, mentor and a leader to most of us. He will be sorely missed. We have lost a great champion in our field. Despite all his commitments and all his pressing duties, he attended virtually every heat transfer conference, saying that this was his "vacation". His contribution to our Division was profound and everyone deeply feels the vacuum created by his untimely death. •

2002 Best Paper Award

"Study of Subcooled Film Boiling on a Horizontal Disc", Part I, Analysis and Part II, Experiment by Debjyoti Banerjee and Vijay Dhir. •

2002 Classic Paper Award

"Correlation for Boiling Heat Transfer to Saturated Fluids in Convective Flow," by John C. Chen. •

HTD Members Elected to Fellow Grade

Arvind Atreya, Donald E. Beasley, Christopher Beckermann, David P. Colvin, A. T. Kirkpatrick, Arunava Majumdar, Joshi Mirza, Don Price, Arsalan Razani, Sanjeev B. Sathe, Mohammed Shah, Y.K. Robert O. Warrington, Jr., Seung M. You, Eric Zimmerman •

Heat Transfer Memorial Award Nominations Sought

Nominations for the Heat Transfer Memorial Award will be accepted through October 1 of each year for the awards to be made in the following year. The purpose of the award is to recognize outstanding contribution to the field of heat transfer through teaching, research, design, or a combination of such activities. For more information concerning the nomination procedures and require-

ments, please contact the 2003-2004 chairperson of the K-3 Honors and Awards Committee Chairperson, Portonova Ayyaswamy, University of Pennsylvania Email: ayya@seas.upenn.edu •

Bergles-Rohsenow Young Investigator Award Established

The Bergles-Rohsenow Young Investigator Award in Heat Transfer is given to a young engineer who is under 36 and has received a Ph.D., or an equivalent degree in engineering. The individual must be committed to pursuing research in heat transfer, and must have demonstrated the potential to make significant contributions to this field. The areas of accomplishment may take the form of, but are not limited to: analytical/numerical methods, equipment/instrumentation, or experimentation - any of which should lead to peer-reviewed publications.

Established by the Heat Transfer Division in 2003, the award was funded through the efforts of Arthur Bergles and Warren Rohsenow who are well known for their accomplishments in heat transfer research and for their mentoring of young researchers.

The first award will be presented in 2004. •

Comprehending Engineers - Take Seven

Normal people...believe that if it ain't broke, don't fix it. Engineers believe that if it ain't broke, it doesn't have enough features yet.

-Scott Adams, *The Dilbert Principle*

Editor for HTD Newsletter

Please send news items related to heat transfer or Division activities to Prof. A. M. Jacobi, Dept. Mech. & Ind. Engrg., University of Illinois, 1206 West Green Street, Urbana, IL 61801; (217) 649-3162; a-jacobi@uiuc.edu.

ASME TAKES HEAT WITH WINNING CONFERENCE PROPOSAL • AVRAM BAR-COHEN

Following the successful proposal by the North American heat transfer community, the 14th International Heat Transfer Conference (IHTC) will be coming to Washington DC in 2010. The conference, overseen by the Assembly for International Heat Transfer Conferences (AIHTC) which represents 31 professional engineering societies active worldwide in thermal science and engineering, has not been held in the United States since the highly successful IHTC of 1986 in San Francisco.

The North American proposal to host the Conference in DC, with ASME as the event manager, was introduced by Dr. Jack Lloyd (BOG) and presented by Avram Bar-Cohen (HTD, BRTD, Nano Institute), Yogesh Jaluria (HTD), and

Edison Aulestia (Staff) to the AIHTC in Grenoble, France at the 12th IHTC Conference, August 2002. The proposal highlighted the attractiveness of DC to international visitors and the strength and breadth of the North American heat transfer community, as well as ASME's rich experience in the organization of large technical conferences and its successful implementation of on-line conference management tools. The 14th IHTC aims to provide an unbiased, non-commercial technical forum for the international heat transfer community and is planned to include keynote lectures, poster sessions, professional development courses, and a virtual – as well as live – exhibit of heat transfer equipment, services, and publications.

In addition to the fundamentals of thermal phenomena and traditional thermal applications, the 14th IHTC is expected to address the emerging domains of thermal transport in nano-materials, bio-systems, MEMS, microsystems, information systems, and energy conversion devices, among many more areas. The 13th IHTC scheduled to be held in Sydney, Australia August 13-18, 2006, co-sponsored by ASME through the AIHTC. For more information on this meeting visit the Heat transfer division webpage events calendar, <http://www.asme.org/divisions/htd/events/index.html>. Continue to visit the division's webpage to obtain more information or get involved in the 14th IHTC in Washington DC. •

2002-2003 Heat Transfer Division • <http://www.asme.org/divisions/htd/>

A special note of thanks to the 2002-2003 HTD Committee chairs for making significant contributions to the division activities this past year.

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You might be an engineer

if you know vector calculus but you can't remember how to do long division.

if you've actually used every single function on your graphing calculator.

if you have a pet named after a scientist.

if you can translate English into Binary.

if you'll assume that a "horse" is a "sphere" in order to make the math easier.

Engineer Identification Test

You walk into a room and notice that a picture is hanging crooked. You...

A. Straighten it.

B. Ignore it.

C. Buy a CAD system and spend the next six months designing a solar-powered, self-adjusting picture frame while often stating aloud your belief that the inventor of the nail was a total moron.

The correct answer is "C," but partial credit can be given to anyone who writes "It depends" in the margin of the test or simply blames the whole stupid thing on marketing.

Past Chair's Message

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Committee by October 1 or to the ASME General Awards Committee by March 1 each year.

On a sad note, Professor Chang-Lin Tien, who was a giant in the field of Heat Transfer passed away on Oct. 29, 2002. He made outstanding contributions in essentially every aspect of heat transfer and opened new avenues for research. Over the past four decades, his smile, humor, and presence have brightened every thermal science meeting around the world. He was a friend, colleague, mentor and a leader to many of us. We have lost a great champion in our field. His contribution to our Division was profound and everyone deeply feels the vacuum created by his untimely death.

There are two other important issues that I would like to bring up. First, the Division has been able to take advantage of new and emerging ideas in the engineering community at large and even to play a leadership role in many initiatives. These include areas such as nano-materials and nano-technology, information technology, bio-systems, fuel cells, and materials processing. This shift has allowed the Division to expand into many new areas and demonstrate the importance of the field in many important endeavors. Second, the members of the Division have, over the recent years, become substantially involved with the activities of other Divisions and Societies, such as manufacturing, fuels, combustion, gas turbines, electronic packaging and environmental systems. Again, this indicates the importance and strength of the basic area of heat transfer and the critical part played by thermal transport in a wide range of practical problems. However, this has also led to some members becoming less active in the conferences and other activities of the Division. While this is not unexpected, I would like to urge all those who are active in other areas and organizations to continue their efforts as they perceive best, but to also preserve their presence in the core area of heat transfer that has

allowed them to diversify their interests. I hope they would continue to contribute to heat transfer and to enrich it with new ideas from other fields.

As we move to another year, the Division continues to make valuable connections with other Divisions within ASME, like Fluids Engineering and Electronic Packaging, and with Divisions with similar interests in other professional societies, such as AIChE, AIAA and ANS. It is also very active on the international scene, with participation in a wide range of conferences and

publications. A proposal was made in Grenoble, France, and was approved so that the 2010 International Heat Transfer Conference will be held in Washington, DC.

There is every reason to be optimistic about the future of both the Heat Transfer Division and the field of heat transfer. Clearly, heat transfer is basic to many different traditional and emerging areas and technologies, making it imperative that fundamental as well as applied work be actively pursued in this interesting and challenging field. •

FUTURE CONFERENCES

International Mechanical Engineering Congress and Exposition

To be held 16 to 21 November, 2003 • Washington, DC.

www.asme.org/congress/

Microgravity Transport Processes in Fluid, Biological and Material Sciences

September 14-19, 2003 • Davos, Switzerland

www.engconfintl.org/3au.htm

2nd BSME-ASME International Conference on Thermal Engineering

January 2- 4, 2004 • Gazipur, Dhaka, Bangladesh

bsme.wtcsites.com/

6th ISHMT-ASME Heat and Mass Transfer

January 5-7, 2004 • Kalpakkam, Tamil Nadu, India

www.igcar.ernet.in/seminars/nhmtc.htm

ICHMT Symposium - CHT04 Advances in Computational Heat Transfer

April 19-24, 2004 • Norwegian Coastal Voyage

cht04.mech.unsw.edu.au

Transport Processes in Emerging Energy Systems

April 25-29, 2004 • Hyatt Regency, New Orleans, LA

www.aiche.org/conferences/spring/

2004 ASME Heat Transfer/Fluids Engineering Summer Conference

July 11-15, 2004 • Westin Charlotte & Convention Center, Charlotte, NC, USA

www.asmeconferences.org/htfed04/

13th International Heat Transfer Conference

August 13-18, 2006 • Sydney, Australia

www.ihtc-13.com

Committees • 2003-2004

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Transfer in Biotechnology (K-17)*
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