



Editor, YOGESH JALURIA (2010)
Assistant to the Editor, S. PATEL

Associate Editors

Yutaka Asako, Tokyo Metropolitan University, Japan (2010)
Gautam Biswas, Indian Inst. of Tech., Kanpur (2009)
Cho Lik Chan, The University of Arizona (2010)
Louis C. Chow, University of Central Florida (2010)
Minking Chyu, Univ. of Pittsburgh (2009)
Frank J. Cunha, Pratt & Whitney (2011)
Ali Ebadian, Florida International Univ. (2011)
Ofodike A. Ezekoye, Univ. of Texas-Austin (2011)
Satish G. Kandlikar, Rochester Inst. of Tech. (2010)
Sung Jin Kim, KAIST, Korea (2010)
Saic L. Lau, Texas A&M Univ. (2009)
Ben Q. Li, Univ. of Michigan, Dearborn (2009)
Raj M. Manglik, Univ. of Cincinnati (2009)
Jayanthi Y. Murthy, Purdue University (2010)
Pamela M. Norris, Univ. of Virginia (2011)
Patrick E. Phelan, Arizona State Univ. (2011)
Roger R. Schmidt, IBM Corporation (2010)
S. A. Sherif, University of Florida (2010)
Heping Tan, Harbin Institute of Technology (2011)
Peter Vadasz, Northern Arizona University (2010)
Jamal Yagoobi, Illinois Inst. of Tech. (2009)
Walter W. Yuen, Univ. of California–Santa Barbara (2011)

Past Editors
V. DHIR
J. R. HOWELL
R. VISKANTA
G. M. FAETH
K. T. YANG
E. M. SPARROW

HEAT TRANSFER DIVISION Chair, C. OH Vice Chair, V. CAREY Past Chair, T. TONG

PUBLICATIONS COMMITTEE Chair, BAHRAM RAVANI

OFFICERS OF THE ASME President, THOMAS M. BARLOW Executive Director, THOMAS G. LOUGHLIN Treasurer, THOMAS D. PESTORIUS

PUBLISHING STAFF

Managing Director, Publishing PHILIP DI VIETRO

Manager, Journals COLIN McATEER

Production Coordinator
JUDITH SIERANT

Transactions of the ASME, Journal of Heat Transfer (ISSN 0022-1481) is published monthly by The American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016. Periodicals postage paid at New York, NY 40016. Periodicals postage paid at New York, NY 40016. Periodicals postage paid at New York, NY 40016 and additional mailling offices. POSTMASTER: Send address changes to Transactions of the ASME, Journal of Heat Transfer, c/o THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 22 Law Drive, Box 2300, Farifield, NJ 07007-2300. CHANGES OF ADDRESS must be received at Society headquarters seven weeks before they are to be effective. Please send old label and new address. STATEMENT from By-Laws. The Society shall not be responsible for statements or opinions advanced in papers or ... printed in its publications (B7.1, Para. 3). COPYRIGHT © 2008 by The American Society of Mechanical Engineers. For authorization to photocopy material for internal or personal use under those circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, tel: 978-750-8400, www.copyright.com. Request for special permission or bulk copying should be addressed to Reprints/Permission Department.

Journal of Heat Transfer

Published Monthly by ASME

VOLUME 130 • NUMBER 11 • NOVEMBER 2008

RESEARCH PAPERS

111001 Adiabatic Horizontal and Vertical Pressure Drop of Carbon Dioxide Inside Smooth and Microfin Tubes at Low Temperatures Yoon Jo Kim, Jeremy Jang, Predrag S. Hrnjak, and Min Soo Kim

Bio-Heat and Mass Transfer

111101 The Limiting Radius for Freezing a Tumor During Percutaneous Cryoablation
Akira Nakayama, Yusuke Kuwahara, Kansei Iwata, and
Masafumi Kawamura

Conduction

111301 Solutions for Transient Heat Conduction With Solid Body Motion and Convective Boundary Conditions
Robert L. McMasters and James V. Beck

111302 Ground Heat Transfer From a Varying Line Source With Seasonal Temperature Fluctuations
X. Duan and G. F. Naterer

Evaporation, Boiling, and Condensation

111501 The Thickness of the Liquid Microlayer Between a Sliding Bubble and a Heated Wall: Comparison of Models to Experimental Data D. Keith Hollingsworth, Xin Li, and Larry C. Witte

Experimental Techniques

111601 Flush-Mounted Steady-Periodic Heated Film With Application to Shear-Stress Measurement Kevin D. Cole

111602 Large-Scale Pulsation Detection by Means of Temperature Measurements
N. Silin, V. Masson, and A. Rauschert

Heat Exchangers

111801 Three-Dimensional Numerical Simulation on the Laminar Flow and Heat Transfer in Four Basic Fins of Plate-Fin Heat Exchangers Yinhai Zhu and Yanzhong Li

Heat Transfer in Manufacturing

112101 Numerical Simulation of Transient Multiphase Field During Hybrid Plasma-Laser Deposition Manufacturing Fanrong Kong, Haiou Zhang, and Guilan Wang

Micro/Nanoscale Heat Transfer

112401 Extraordinary Coherent Thermal Emission From SiC Due to Coupled Resonant Cavities
Nir Dahan, Avi Niv, Gabriel Biener, Yuri Gorodetski,
Vladimir Kleiner, and Erez Hasman

112402 Effect of Channel Geometry Variations on the Performance of a Constrained Microscale-Film Ammonia-Water Bubble Absorber Jeromy Jenks and Vinod Narayanan

Porous Media

112601 Stability and Convection in Impulsively Heated Porous Layers M. J. Kohl, M. Kristoffersen, and F. A. Kulacki

(Contents continued on inside back cover)

This journal is printed on acid-free paper, which exceeds the ANSI Z39.48-1992 specification for permanence of paper and library materials. ⊚™

® 85% recycled content, including 10% post-consumer fibers.