## **JOURNAL OF HEAT TRANSFER**

Vol. 133 - 2011

# SPIS TREŚCI

no 1

## **GUEST EDITORIAL**

010301 Special Issue on Heat and Mass Transfer in Biosystems / **Peter Vadasz** and Andrey V. Kuznetsov

## **RESEARCH PAPERS**

KLSLAN	CII PAPERS
011001	The Constructal Law and the Design of the Biosphere: Nature and
	Globalization / Adrian Bejan and Sylvie Lorente
011002	Optimal Drug-Aerosol Delivery to Predetermined Lung Sites / Clement
	Kleinstreuer and Zhe Zhang
011003	Using MicroCT Imaging Technique to Quantify Heat Generation
	Distribution Induced by Magnetic Nanoparticles for Cancer Treatments /
	Anilchandra Attaluri, Ronghui Ma, and Liang Zhu
011004	Principles of Tissue Engineering With Nonthermal Irreversible
	Electroporation / Mary Phillips, Elad Maor, and Boris Rubinsky
011005	Cryosurgery: Analysis and Experimentation of Cryoprobes in Phase
	Changing Media / Avraham Shitzer
011006	Analysis of Heat Transfer in Consecutive Variable Cross-Sectional
	Domains: Applications in Biological Media and Thermal Management /
	Shadi Mahjoob and Kambiz Vafai
011007	Modeling Bidirectional Transport of New and Used Organelles in Fast
	Axonal Transport in Neurons / A. V. Kuznetsov
011008	Metabolic Mass Transfer in Monotonic Growth of Microorganisms /
	Peter Vadasz and Alisa S. Vadasz
011009	Human Eye Response to Thermal Disturbances / Maryam Shafahi and
	Kambiz Vafai
011010	Modeling Bioheat Transport at Macroscale / Liqiu Wang and Jing Fan
011011	Skin Electroporation With Passive Transdermal Transport Theory:
	A Review and a Suggestion for Future Numerical Model Development /
	S. M. Becker
011012	Adhesin-Specific Nanomechanical Cantilever Biosensors for Detection of

Microorganisms / Tzuen-Rong J. Tzeng, Yunyan R. Cheng, Reza

Saeidpourazar, Siddharth S. Aphale, and Nader Jalili

CONDUCTION

- 021301 Temperature Created by a Tilted Moving Heat Source: Heating Line and Cylinder / Valerian Nemchinsky
- 021302 Heat Transfer in Thin Multilayered Plates Part I: A New Approach / T. K. Papathanasiou, S. I. Markolefas, S. P. Filopoulos, and G. J. Tsamasphyros
- O21303 Heat Transfer in Thin Multilayered Plates Part II: Applications to the Composite Patch Repair Technique / T. K. Papathanasiou, S. I. Markolefas, S. P. Filopoulos, and G. J. Tsamasphyros
- 021304 Boundary Control of Temperature Distribution in a Rectangular Functionally Graded Material Plate / Hossein Rastgoftar, Mohammad Eghtesad, and Alireza Khayatian

## EVAPORATION, BOILING, AND CONDENSATION

021501 Dropwise Condensation Underneath Chemically Textured Surfaces: Simulation and Experiments / Basant Singh Sikarwar, Nirmal Kumar Battoo, Sameer Khandekar, and K. Muralidhar

## FORCED CONVECTION

- 021701 Heat and Mass Transfer on the MHD Fluid Flow Due to a Porous Rotating Disk With Hall Current and Variable Properties / **Mustafa Turkyilmazoglu**
- 021702 Convective Heat Transfer on a Rotating Disk With Transverse Air Crossflow / **Benjamin Latour, Pascale Bouvier, and Souad Harmand**
- 021703 Bifurcated Forced Convective Heat Transfer of Supercritical CO<sub>2</sub> Flow in Plane Symmetric Sudden Expansion Duct / **Bi-Li Deng, Xin-Rong Zhang, and Hiroshi Yamaguchi**

## **HEAT EXCHANGERS**

O21801 Cost and Entropy Generation Minimization of a Cross-Flow Plate Fin Heat Exchanger Using Multi-Objective Genetic Algorithm / Pouria Ahmadi, Hassan Hajabdollahi, and Ibrahim Dincer

#### HEAT TRANSFER ENHANCEMENT

- 021901 The Physical Mechanism of Heat Transfer Augmentation in Stagnating Flows Subject to Freestream Turbulencje / Andrew R. Gifford, Thomas E. Diller, and Pavlos P. Vlachos
- 021902 Heat Transfer Enhancement of MHD Flow by Conducting Strips on the Insulating Wall / **Hulin Huang and Bo Li**

## MICRO/NANOSCALE HEAT TRANSFER

- 022401 Modeling of Heat Transfer in Microchannel Gas Flow / **Tomasz Lewandowski, Tomasz Ochrymiuk, and Justyna Czerwinska**
- 022402 Phonon Boundary Effects and Thermal Conductivity of Rough Concentric Nanowires / F. X. Alvarez, D. Jou, and A. Sellitto
- Thermal Conductivity Measurement of Graphene Exfoliated on Silicon Dioxide / Jae Hun Seol, Arden L. Moore, Li Shi, Insun Jo, and Zhen Yao

022404 Numerical Analysis of the Time-Dependent Energy and Momentum Transfers in a Rarefied Gas Between Two Parallel Planes Based on the Linearized Boltzmann Equation / **Toshiyuki Doi** 

## NATURAL AND MIXED CONVECTION

- 022501 Modeling of Free Convection Heat Transfer to a Supercritical Fluid in a Square Enclosure by the Lattice Boltzmann Method / **Mostafa**Varmazyar and Majid Bazargan
- 022502 MHD Mixed Convection Boundary Layer Flow Toward a Stagnation Point on a Vertical Surface With Induced Magnetic Field / F. M. Ali, R. Nazar, N. M. Arifin, and I. Pop
- 022503 Mixed Convective Heat Transfer Past a Heated Square Porous Cylinder in a Horizontal Channel With Varying Channel Height / Horng-Wen Wu and Ren-Hung Wang

- 024501 Enhanced Specific Heat of Silica Nanofluid / **Donghyun Shin and Debjyoti Banerjee**
- 024502 Laminar Heat and Mass Transfer in Rotating Cone-and-Plate Devices / I. V. Shevchuk
- O24503 Analytical Solution for Thermally Fully Developed Combined Electroosmotic and Pressure-Driven Flows in Narrow Confinements With Thick Electrical Double Layers / Ranabir Dey, Debapriya Chakraborty, and Suman Chakraborty

## **GUEST EDITORIAL**

030301 Special Issue on Advanced Thermal Processing / Wilson K. S. Chiu, Costas P. Grigoropoulos, and Ben Q. Li

### **RESEARCH PAPERS**

- O31001 Structure Controlled Synthesis of Vertically Aligned Carbon Nanotubes
  Using Thermal Chemical Vapor Deposition Process / Myung Gwan
  Hahm, Young-Kyun Kwon, Ahmed Busnaina, and Yung Joon
  Jung
- 031002 Modeling of Ceramic Particle Heating and Melting in a Microwave Plasma / Kaushik Saha, Swetaprovo Chaudhuri, and Baki M. Cetegen
- 031003 Modeling of Ultrafast Phase Change Processes in a Thin Metal Film Irradiated by Femtosecond Laser Pulse Trans / Jing Huang, Yuwen Zhang, J. K. Chen, and Mo Yang
- O31004 Characteristics of Pool Boiling Bubble Dynamics in Bead Packed Porous Structures / Calvin H. Li, Ting Li, Paul Hodgins, and G. P. Peterson
- 031005 Thermal Science of Weld Bead Defects: A Review / P. S. Wei
- 031006 The Experimental and Theoretical Evaluation of an Indirect Cooling System for Machining / Jay C. Rozzi, John K. Sanders, and Weibo Chen
- 031007 Modeling of the Off-Axis High Power Diode Laser Cladding Process / Shaoyi Wen and Yung C. Shin
- 031008 Theoretical Analysis of Microwave Heating of Dielectric Materials Filled in a Rectangular Waveguide With Various Resonator Distances / **Phadungsak Rattanadecho and Waraporn Klinbun**
- 031009 Single-Phase Thermal Transport of Nanofluids in a Minichannel / **Dong Liu and Leyuan Yu**
- 031010 Modeling Transport in Porous Media With Phase Change: Applications to Food Processing / Amit Halder, Ashish Dhall, and Ashim K. Datta

## **TECHNOLOGY REVIEWS**

- 034001 Thermal Processing of Tissue Engineering Scaffolds / Alisa Morss Clyne
- 034002 Titania Nanotubes: Novel Nanostructures for Improved Osseointegration / Nathan Swami, Zhanwu Cui, and Lakshmi S. Nair

## **REVIEW ARTICLES**

040801 Review of Heat Conduction in Nanofluids / Jing Fan and Liqiu Wang

#### **RESEARCH PAPERS**

**ELECTRONIC COOLING** 

041401 Thermodynamic Basis of Dual-Phase-Lagging Heat Conduction / Mingtian Xu

## EVAPORATION, BOILING, AND CONDENSATION

- O41501 Correlation of Subatmospheric Pressure, Saturated, Pool Boiling of Water on a Structured-Porous Surface / **Sean J. Penley and R. A. Wirtz**
- 041502 Numerical Simulation of Dynamics and Heat Transfer Associated With a Single Bubble in Subcooled Boiling and in the Presence of Noncondensables / **Jinfeng Wu and Vijay K. Dhir**
- O41503 Scaling of Natural Convection of an Inclined Flat Plate: Sudden Cooling Condition / Suvash C. Saha, John C. Patterson, and Chengwang Lei

## **EXPERIMENTAL TECHNIQUES**

041601 A New Technique to Determine Convection Coefficients With Flow Through Particle Beds / Xiaodong Nie, Richard Evitts, Robert Besant, and John Bolster

#### HEAT TRANSFER ENHANCEMENT

- O41901 An Improved Volume of Fluid Method for Two-Phase Flow Computations on Collocated Grid System / **Dong-Liang Sun, Yong-Ping Yang, Jin-Liang Xu, and Wen-Quan Tao**
- 041902 Heat Transfer Enhancement Using Laminar Gas-Liquid Segmented Plug Floks / Y. S. Muzychka, E. J. Walsh, and P. Walsh
- 041903 Enhancement and Prediction of Heat Transfer Rate in Turbulent Flow Through Tube With Perforated Twisted Tape Inserts: A New Correlation / J. U. Ahamed, M. A. Wazed, S. Ahmed, Y. Nukman, T. M. Y. S. Tuan Ya, and M. A. R. Sarkar

### **HEAT AND MASS TRANSFER**

042001 Intraparticle Mass Transfer in Adsorption Heat Pumps: Limitations of the Linear Driving Force Approximation / **Alexander Raymond and Srinivas Garimella** 

#### MICRO/NANOSCALE HEAT TRANSFER

- 042401 Heat Transfer From Freely Suspended Bimaterial Microcantilevers / **Arvind Narayanaswamy and Ning Gu**
- 042402 Phonon Transport Across Mesoscopic Constrictions / **Dhruv Singh**, **Jayathi Y. Murthy, and Timothy S. Fisher**

## NATURAL AND MIXED CONVECTION

042501 Measurement of Time-Averaged Turbulent Free Convection in a Tall Enclosure Using Interferometry / M. E. Poulad, D. Naylor, and P. H. Oosthuizen

## POROUS MEDIA

042601 Resonance of Natural Convection Inside a Bidisperse Porous Medium Enclosure / **Arunn Narasimhan and B. V. K. Reddy** 

## RADIATIVE HEAT TRANSFER

O42701 Global Spectral Methods in Gas Radiation: The Exact Limit of the SLW Model and Its Relationship to the ADF and FSK Methods / V. P. Solovjov and B. W. Webb

## TWO - PHASE FLOW AND HEAT TRANSFER

042901 Effects of Film Evaporation and Condensation on Oscillatory Flow and Heat Transfer in an Oscillating Heat Pipe / **Wei Shao and Yuwen Zhang** 

## **TECHNICAL BRIEFS**

- 044501 Efficiency Comparison Between Circular and Semicircular Fins Circumscribing Circular Pipes / R. Chakraborty and A. Sirkar
- O44502 Improved Discrete Ordinates Method for Ray Effects Mitigation / **Zhi-Feng Huang, Huai-Chun Zhou, and Pei-feng Hsu**
- 044503 Heat Transfer Properties and Energy-Exergy Efficiency in a Finned Cross-Flow Heat Recovery Unit / **Isak Kotcioglu and Ahmet Cansiz**
- 044504 Numerical Inversion of Laplace Transform for Time Resolved Thermal Characterization Experiment / J. Toutain, J.-L. Battaglia, C. Pradere, J. Pailhes, A. Kusiak, W. Aregba, and J.-C. Batsale
- O44505 Re-examining Electron-Fermi Relaxation in Gold Films With a Nonlinear Thermoreflectance Model / Patrick E. Hopkins, Leslie M. Phinney, and Justin R. Serrano
- 044506 Forced Convection in a Polygonal Duct With a Circular Core / C. Y. Wang

## **ERRATA**

047001 Erratum: "Therporaoustic Convection: Modeling and Analysis of Flow, Thermal, and Energy Fields" [Journal of Heat Transfer, 2009, 131(10), p. 101011] / **Shohel Mahmud and Roydon Andrew Fraser** 

**BIO - HEAT AND MASS TRANSFER** 

051101 Numerical Analysis of Specific Absorption Rate and Heat Transfer in the Human Body Exposed to Leakage Electromagnetic Field at 915 MHz and 2450 MHz / Teerapot Wessapan, Siramate Srisawatdhisukul, and Phadungsak Rattanadecho

## **ELECTRONIC COOLING**

On the Cooling of Electronics With Nanofluids / W. Escher,
T. Brunschwiler, N. Shalkevich, A. Shalkevich, T. Burgi,
B. Michel, and D. Poulikakos

## EVAPORATION, BOILING, AND CONDENSATION

- 051501 Investigation on Intertube Falling-Film Heat Transfer and Mode Transitions of Aqueous-Alumina Nanofluids / **Binglu Ruan and Anthony M. Jacobi**
- 051502 Flow Boiling of R134a in Circular Microtubes Part I: Study of Heat Transfer Characteristics / Saptarshi Basu, Sidy Ndao, Gregory J. Michna, Yoav Peles, and Michael K. Jensen
- 051503 Flow Boiling of R134a in Circular Microtubes Part II: Study of Critical Heat Flux Condition / Saptarshi Basu, Sidy Ndao, Gregory J. Michna, Yoav Peles, and Michael K. Jensen

## EXPERIMENTAL TECHNIQUES

051601 Thermovibrational Instability in a Fluid Saturated Anisotropic Porous Medium / S. Saravanan and T. Sivakumar

## FORCED CONVECTION

- Validation and Analysis of Numerical Results for a Varying Aspect Ratio Two-Pass Internal Cooling Chanel / Igor V. Shevchuk, Sean
   C. Jenkins, Bernhard Weigand, Jens von Wolfersdorf, Sven Olaf Neumann, and Martin Schnieder
- O51702 Parametric Numerical Study of Flow and Heat Transfer in Microchannels With Wavy Walls / Liang Gong, Krishna Kota, Wenquan Tao, and Yogendra Joshi

## JETS, WAKES, AND IMPINGEMENT COOLING

052201 Development of a General Dynamic Pressure Based Single-Phase Spray Cooling Heat Transfer Correlation / **Bahman Abbasi and Jungho Kim** 

## MICRO/NANOSCALE HEAT TRANSFER

052401 Prediction of Thermal Conductivity and Convective Heat Transfer Coefficient of Nanofluids by Local Composition Theory / M. S. Hosseini, A. Mohebbi, and S. Ghader

## NATURAL AND MIXED CONVECTION

052501 Natural Convection in a Quadrantal Cavity Heated and Cooled on Adjacent Walls / **Orhan Aydin and Gurkan Yesiloz** 

052502 Diffusion-Thermo Effects on Free Convective Heat and Mass Transfer Flow in a Vertical Channel With Symmetric Boundary Conditions / **Basant K. Jha and Abiodun O. Ajibade** 

#### POROUS MEDIA

- O52601 Second Law Analysis for Free Convection in Non-Newtonian Fluids Over a Horizontal Plate Embedded in a Porous Medium: Prescribed Surface Temperature / W. A. Khan and Rama Subba Reddy Gorla
- 052602 Transient Aspects of Heat Flux Bifurcation in Porous Media: An Exact Solution / **Kun Yang and Kambiz Vafai**

## TWO - PHASE FLOW AND HEAT TRANSFER

- 052901 Visualization of Two-Phase Flows in Nanofluid Oscillating Heat Pipes / Qi-Ming Li, Jiang Zou, Zhen Yang, Yuan-Yuan Duan, and Bu-Xuan Wang
- O52902 Pool Boiling Heat Transfer and Bubble Dynamics Over Plain and Enhanced Microchannels / **Dwight Cooke and Satish G. Kandlikar**

- 054501 Flow and Heat Transfer Over a Continuously Moving Flat Plate in a Porous Medium / W. A. Khan and I. Pop
- 054502 Mineral Fouling Control by Underwater Plasma Discharge in a Heat Exchanger / Yong Yang, Hyoungsup Kim, Alexander Fridman, and Young I. Cho
- O54503 Forced Convection Boundary Layer Flow Past Nonisothermal Thin Needles in Nanofluids / **T. Grosan and I. Pop**
- 054504 Evaluation of Compact and Effective Air-Cooled Carbon Foam Heat Sink / W. Wu, J. H. Du, Y. R. Lin, L. C. Chow, H. Bostanci, B. A. Saarloos, and D. P. Rini
- On the Generalized Brinkman Number Definition and Its Importance for Bingham Fluids / P. M. Coelho and J. C. Faria

## **GUEST EDITORIAL**

060301 Thermal Issues in Emerging Technologies / **Yogendra Joshi and Mohamed-Nabil Sabry** 

#### THERMAL ISSUES IN EMERGING TECHNOLOGIES

- 060901 Simulation on Flow and Heat Transfer in Diesel Particulate Filter / Kazuhiro Yamamoto and Masamichi Nakamura
- O60902 Convective Heat Transfer in Graphite Foam Heat Sinks With Baffle and Stagger Structures / K. C. Leong, H. Y. Li, L. W. Jin, and J. C. Chai
- O60903 Cooling Characteristics of Regenerative Magnetic Refrigeration With Particle-Packed Bed / Tsuyoshi Kawanami, Shigeki Hirano, Masahiro Ikegawa, and Koji Fumoto
- 060904 Heat Transfer Performance of Aluminum Foams / Simone Mancin, Claudio Zilio, Luisa Rossetto, and Alberto Cavallini
- 060905 Generalization of the Heat Transfer Coefficient Concept for System Simulation / **Mohamed-Nabil Sabry**
- 060906 A Review of Microscale Transport in the Thermal Processing of New and Emerging Advanced Materiale / **Yogesh Jaluria and Jing Yang**

#### **RESEARCH PAPERS**

## EVAPORATION, BOILING, AND CONDENSATION

- O61501 A Semi-Empirical Model for Condensation Heat Transfer Coefficient of Mixed Ethanol-Water Vapors / Yang Li, JunJie Yan, JinShi Wang, and GuoXiang Wang
- O61502 Thermal and Visual Observation of Water and Acetone Oscillating Heat Pipes / C. Wilson, B. Borgmeyer, R. A. Winholtz, H. B. Ma, D. Jacobson, and D. Hussey

## **EXPERIMENTAL TECHNIQUES**

Measuring the Thermal Conductivity of Porous, Transparent SiO<sub>2</sub> Films With Time Domain Thermoreflectance / Patrick E. Hopkins, Bryan Kaehr, Leslie M. Phinney, Timothy P. Koehler, Anne M. Grillet, Darren Dunphy, Fred Garcia, and C. Jeffrey Brinker

## FORCED CONVECTION

061701 Numerical and Experimental Investigation of Laminar Channel Flow With a Transparent Wall / **Jing He, Liping Liu, and Anthony M. Jacobi** 

#### HEAT TRANSFER ENHANCEMENT

- O61901 Transient Thermal Response of Pin-Fin Sandwich Panels to Hot Jet Impingement / S. S. Feng, T. J. Lu, and T. Kim
- 061902 Comparisons of Pins/Dimples/Protrusions Cooling Concepts for a Turbine Blade Tip-Wall at High Reynolds Numbers / **Gongnan Xie, Bengt Sundén, and Weihong Zhang**

## MELTING AND SOLIDIFICATION

062301 Heat Conduction Equation Solution in the Presence of a Change of State in a Bounded Axisymmetric Cylindrical Domain / **Danillo Silva de Oliveira and Fernando Brenha Ribeiro** 

## MICRO/NANOSCALE HEAT TRANSFER

O62401 Anharmonic Phonon Interactions at Interfaces and Contributions to Thermal Boundary Conductance / Patrick E. Hopkins, John C. Duda, and Pamela M. Norris

## NATURAL AND MIXED CONVECTION

- 062501 High Rayleigh Number Natural Convection Inside 2D Porous Enclosures
  Using the Lattice Boltzmann Metod / Ramanathan Vishnampet,
  Arunn Narasimhan, and V. Babu
- 062502 Natural Convection in a Saturated Variable-Porosity Medium Due to Microwave Heating / Watit Pakdee and Phadungsak Rattanadecho

#### RADIATIVE HEAT TRANSFER

O62701 Analysis of Radiation Modeling for Turbulent Combustion: Development of a Methodology to Couple Turbulent Combustion and Radiative Heat Transfer in LES / Damien Poitou, Mouna El Hafi, and Bénédicte Cuenot

#### **TECHNICAL BRIEFS**

- On the Scalability of Liquid Microjet Array Impingement Cooling for Large Area Systems / **Avijit Bhunia and C. L. Chen**
- O64502 Geometrical Effects on the Temperature Distribution in a Half-Space Due to a Moving Heat Source / Mohsen Akbari, David Sinton, and Maiid Bahrami
- 064503 Mathematical Modeling of Transport Processes in Funnel Shaped Mold of Steel Thin Slab Continuous Caster / A. Hajari, S. H. Seyedein, and M. R. Aboutalebi

#### **ERRATA**

067001 Erratum: "The Effect of Buoyancy on Heat Transfer in Supercritical Water Flow in a Horizontal Round Tube" [ASME J. Heat Transfer, 2005, 127(8), pp. 897–902] / Majid Bazargan, Daniel Fraser, and Vijay Chatoorgan

COMBUSTION AND REACTIVE FLOWS

071201 Prevention and Intensification of Melt-Water Explosive Interactions / Stephen M. Zielinski, Anthony A. Sansone, Matthew Ziolkowski, and Rusi P. Taleyarkhan

#### CONDUCTION

O71301 Approximation of Transient 1D Conduction in a Finite Domain Using Parametric Fractional Derivatives / Sergio M. Pineda, Gerardo Diaz, and Carlos F. M. Coimbra

## EVAPORATION, BOILING, AND CONDENSATION

071501 Estimation and Analysis of Surface Heat Flux During Quenching in CNT Nanofluids / **K. Babu and T. S. Prasanna Kumar** 

## FORCED CONVECTION

- 071701 Effect of Turbulent Prandtl Number on Convective Heat Transfer to Turbulent Flow of a Supercritical Fluid in a Vertical Round Tube / Mahdi Mohseni and Majid Bazargan
- 071702 Explicit Inversion of Stodola's Area-Mach Number Equation / **Joseph Majdalani and Brian A. Maicke**
- 071703 Heat Transfer to Flat Strips Immersed in a Fluidized Bed /
  Christopher Penny, Dennis Rosero, David Naylor, and Jacob
  Friedman
- 071704 Effects of Suction and Blowing on Flow and Heat Transfer Between Two Rotating Spheres With Time-Dependent Angular Velocities / **Omid Mahian, Asgahr B. Rahimi, and Ali Jabari Moghadam**
- 071705 Electro-Osmotic Heat Transfer of Non-Newtonian Fluid Flow in Microchannels / **Chien-Hsin Chen**
- 071706 Heat Transfer Characteristics of Gaseous Slip Flow in Concentric Micro-Annular Tubes / **Chungpyo Hong, Yutaka Asako, and Koichi Suzuki**
- 071707 Convective Heat Transfer in a Rotor Stator System Air Gap With Multiple Suctions of Fluid Through the Stator / Julien Pellé and Souad Harmand

## **HEAT EXCHANGERS**

071801 Bejan's Constructal Theory Analysis of Gas-Liquid Cooled Finned Module / **Giulio Lorenzini and Simone Moretti** 

## MICRO/NANOSCALE HEAT TRANSFER

072401 Transient Energy and Heat Transport in Metals: Effect of the Discrete Character of the Lattice / Y. Ezzahri, K. Joulain, and A. Shakouri

## NATURAL AND MIXED CONVECTION

072501 Natural Convection in a Rocking Square Enclosure: Experimental Results / R. Chávez, F. J. Solorio, and J. G. Cervantes

#### POROUS MEDIA

- 072601 Forced Convection in a Channel Partly Occupied by a Bidisperse Porous Medium: Symmetric Case / **D. A. Nield and A. V. Kuznetsov**
- 072602 Thermal Nonequilibrium and Viscous Dissipation in the Thermal Entrance Region of a Darcy Flow With Streamwise Periodic Boundary Conditions / A. Barletta, E. Rossi di Schio, and L. Selmi

## RADIATIVE HEAT TRANSFER

- 072701 Direct and Indirect Methods for Calculating Thermal Emission From Layered Structures With Nonuniform Temperatures / L. P. Wang, S. Basu, and Z. M. Zhang
- O72702 Study of Laminar Forced Convection of Radiating Gas Over an Inclined Backward Facing Step Under Bleeding Condition Using the Blocked-Off Metod / A. B. Ansari and S. A. Gandjalikhan Nassab

- 074501 On the Linear Temperature Dependence of Phonon Thermal Boundary Conductance in the Classical Limit / **John C. Duda, Pamela M. Norris, and Patrick E. Hopkins**
- 074502 A Correlation for Confined Nucleate Boiling Heat Transfer / Mark Aaron Chan, Christopher R. Yap, and Kim Choon Ng

## **PHOTOGALLERY**

- 080901 Heat Transfer Galery / Kenneth D. Kihm and Chang K. Choi
- 080902 Microscopic Images of Graphene Layers of Different Thicknesses / K. D. Kihm, J. S. Park, S. S. Cheon, and J. S. Lee
- 080903 Liquid Evaporation on Superhydrophobic and Superhydrophilic Nanostructured Surfaces / Nenad Miljkovic, Ryan Enright, Shalabh C. Maroo, H. Jeremy Cho, and Evelyn N. Wang
- O80904 Contact Angle Variation on a Copper Surface Treated With Self-Assembled Monolayer (SAM) of N-octadecyl Mercaptan / Yulong Ji, Hsiu-hung Chen, Qingsong Yu, Xuehu Ma, and H. B. Ma
- 080905 Dynamic Spreading of a Droplet Impinging on Micro-Textured Surfaces / Jae Bong Lee, Seong Hyuk Lee, and Chang Kyoung Choi
- 080906 Condensation and Collapse of Vapor Bubble Injected to Subcooled Pool / Ichiro Ueno, Ryota Hosoya, and Chungpyo Hong
- 080907 Biological Temperature Sensing of Focal Contacts / Jen-Yung Chang, Brian Plunger, Jong-Min Kim, and Chang Kyoung Choi
- 080908 IR Thermography of Two-Phase Microgap Choler / **Jessica Sheehan** and Avram Bar-Cohen
- 080909 Investigation of Surface Convection Enhancement by a V-Formation Winglet Array Using Infrared Thermography / Jing He and Anthony M. Jacobi
- 080910 In-Vivo Detection of Skin Cancer Using the Dynamic Infrared Imaging Technique / C. Herman and M. Pirtini Çetingül
- 080911 Transport in Passive, High Thermal, Conductivity Heat Spreaders / Ram Ranjan, Suresh V. Garimella, and Jayathi Y. Murthy

#### **RESEARCH PAPERS**

**ELECTRONIC COOLING** 

081401 Modeling and Validating the Transient Behavior of Flat Miniature Heat Pipes Manufactured in Multilayer Printed Circuit Board Technology / Wessel W. Wits and Jim B. W. Kok

## EVAPORATION, BOILING, AND CONDENSATION

- 081501 Flow Boiling Heat Transfer Characteristics of a Minichannel up to Dryout Condition / Rashid Ali, Björn Palm, and Mohammad H. Magbool
- 081502 Dropwise Condensation Modeling Suitable for Superhydrophobic Surfaces / **Sunwoo Kim and Kwang J. Kim**
- 081503 Subcooled Boiling of PF-5060 Dielectric Liquid on Microporous Surfaces / **Mohamed S. El-Genk and Amir F. Ali**
- 081504 A Dynamic Film Model of the Pulsating Heat Pipe / Vadim S. Nikolayev

## **EXPERIMENTAL TECHNIQUES**

- Optical Measurement of Thermal Conductivity Using Fiber Aligned Frequency Domain Thermoreflectance / Jonathan A. Malen, Kanhayalal Baheti, Tao Tong, Yang Zhao, Janice A. Hudgings, and Arun Majumdar
- 081602 Inverse Estimation for Heat Flux Distribution at the Metal-Mold Interface Using Fuzzy Inferencje / Lina Zhu, Guangjun Wang, Hong Chen, and Zhaoming Luo

081603 Casing Convective Heat Transfer Coefficient and Reference Freestream Temperature Determination Near an Axial Flow Turbine Rotor / C. Camci and B. Gumusel

#### FORCED CONVECTION

081701 Transient Thermal Response of Turbulent Compressible Boundary Layers / Hongwei Li, M. Razi Nalim, and Charles L. Merkle

## **HEAT EXCHANGERS**

081801 Thermal and Hydraulic Performance of Counterflow Microchannel Heat Exchangers With and Without Nanofluids / Hamid Reza Seyf and Shahabeddin Keshavarz Mohammadian

## HEAT TRANSFER ENHANCEMENT

- 081901 The Effect of the Corrugation Rib Angle of Attack on the Fluid Flow and Heat Transfer Characteristics Inside Corrugated Ribbed Passage / A. M. I. Mohamed, R. Hoettiba, and A. M. Saif
- 081902 Constructal Design of Complex Assembly of Fins / Giulio Lorenzini,
  Roberta Lima Corrêa, Elizaldo Domingues dos Santos, and Luiz
  Alberto Oliveira Rocha

## MICRO/NANOSCALE HEAT TRANSFER

O82401 Surface Functionalization Mechanisms of Enhancing Heat Transfer at Solid-Liquid Interfaces / Javier V. Goicochea, Ming Hu, Bruno Michel, and Dimos Poulikakos

## NATURAL AND MIXED CONVECTION

- 082501 Flow Structure and Heat Transfer in a Stagnation Flow CVD Reaktor / Nasir Memon and Yogesh Jaluria
- 082502 Underhood Buoyancy Driven Flow An Experimental Study / Parviz Merati, Charles Davis, K.-H. Chen, and J. P. Johnson

## RADIATIVE HEAT TRANSFER

082701 Differential Approximations to the Radiation Transfer Equation by Chapman – Enskog Expansion / A. V. Gusarov

### THERMAL SYSTEMS

082801 Heat Transfer in Double U-Tube Boreholes With Two Independent Circuits / **Parham Eslami-nejad and Michel Bernier** 

## IN APPRECIATION

090401 In Appreciation / James F. Klausner

#### **RESEARCH PAPERS**

CONDUCTION

091301 Effective Thermal Properties of Layered Systems Under the Parabolic and Hyperbolic Heat Conduction Models Using Pulsed Heat Sources / J. Ordóñez-Miranda and J. J. Alvarado-Gil

## EVAPORATION, BOILING, AND CONDENSATION

091501 Transient Two-Phase Flow Patterns by Application of a High Voltage Pulse Width Modulated Signal and the Effect on Condensation Heat Transfer / **Kevin Ng, Chan Y. Ching, and James S. Cotton** 

091502 Heat Transfer Analysis of Room-Temperature Finned-Tube Evaporator for Cryogenic Nitrogen / **Shun Ching Lee and Tzu-Min Chen** 

## **EXPERIMENTAL TECHNIQUES**

091601 Heat Transfer Experiments in a Confined Jet Impingement
Configuration Using Transient Techniques / Florian Hoefler, Nils
Dietrich, and Jens Wolfersdorf

## FORCED CONVECTION

O91701 An Approximate Analytical Solution for Electro-Osmotic Flow of Power-Law Fluids in a Planar Microchannel / **Arman Sadeghi, Moslem** Fattahi, and Mohammad Hassan Saidi

091702 Use of Optimal Homotopy Asymptotic Method and Galerkin's Finite Element Formulation in the Study of Heat Transfer Flow of a Third Grade Fluid Between Parallel Plater / S. Iqbal, A. R. Ansari, A. M. Siddiqui, and A. Javed

## HEAT TRANSFER ENHANCEMENT

091901 Heat Transfer Characteristics of Baffled Channel Flow / Changwoo Kang and Kyung-Soo Yang, Professor

### **HEAT AND MASS TRANSFER**

092001 An Analytical Solution to Heat and Mass Transfer in Hollow Fiber Membrane Contactors for Liquid Desiccant Air Dehumidification / Li-Zhi Zhang

#### MICRO/NANOSCALE HEAT TRANSFER

092401 Computational Study of Thermal Rectification From Nanostructured Interfaces / **N. A. Roberts and D. G. Walker** 

092402 Generalized Ballistic-Diffusive Formulation and Hybrid  $S_N$ - $P_N$  Solution of the Boltzmann Transport Equation for Phonons for Nonequilibrium Heat Conduction / **Arpit Mittal and Sandip Mazumder** 

## NATURAL AND MIXED CONVECTION

092501 Magnetohydrodynamic Free Convective Couette Flow With Suction and Injection / **Basant K. Jha and Clement A. Apere** 

092502 Effects of Various Physical and Numerical Parameters on Heat Transfer in Vertical Passages at Relatively Low Heat Loading / **Amir Keshmiri** 

#### POROUS MEDIA

- 092601 A Study of Double Diffusive Free Convection From a Corrugated Vertical Surface in a Darcy Porous Medium Under Soret and Dufour effects / S.V.S.S.N.V.G. Krishna Murthy, B.V. Rathish Kumar, Peeyush Chandra, Vivek Sangwan, and Mohit Nigam
- 092602 Mixed Convection in a Vertical Channel Containing Porous and Viscous Fluid Regions With Viscous Dissipation and Inertial Effects:
  A Perturbation Solution / Mastaneh Hajipour and Asghar Molaei
  Dehkordi
- O92603 Thermal Modeling of Forced Convection in a Parallel-Plate Channel Partially Filled With Metallic Foams / H. J. Xu, Z. G. Qu, T. J. Lu, Y. L. He, and W. Q. Tao

#### TWO - PHASE FLOW AND HEAT TRANSFER

092901 Developing the Coaxial Dual-Pipe Heat Pipe for Applications on Heat Pipe Cooler / **Chen-Ching Ting and Chien-Chih Chen** 

## **TECHNICAL BRIEFS**

- 094501 Free Convection Boundary Layer Flow Past a Horizontal Flat Plate Embedded in a Porous Medium Filled With a Nanofluid / W. A. Khan and I. Pop
- 094502 Numerical Modeling of Steady Burning Characteristics of Spherical Ethanol Particles in a Spray Environment / Vaibhav Kumar Sahu, Vasudevan Raghavan, Daniel N. Pope, and George Gogos

#### **ERRATA**

- 097001 Erratum: "Review of Heat Conduction in Nanofluids"[Journal of Heat Transfer, 2011, 133(4), p. 040801] / **Jing Fan and Liqiu Wang**
- 097002 Erratum: "A Quasidependent Scattering Radiative Properties Model for High Density Fiber Composites" [Journal of Heat Transfer, 2010, 132(2), p. 023303] / **Siu-Chun Lee**
- 097003 Erratum: "Study of Laminar Forced Convection of Radiating Gas Over an Inclined Backward Facing Step Under Bleeding Condition Using the Blocked-Off Method" [ASME J. Heat Transfer, 2011, 133(7), p. 072702] / A. B. Ansari and S. A. Gandjalikhan Nassab
- 097004 Erratum: "A Design and Rating Method for Shell-and-Tube Heat Exchangers with Helical Baffles" [ASME J. Heat Transfer, 2010, 132(5), p. 051802] / J. F. Zhang, Y. L. He, and W. Q. Tao

**ELECTRONIC COOLING** 

101401 An Investigation of a Tunable Magnetomechanical Thermal Switch / Katherine E. Bulgrin, Y. Sungtaek Ju, Greg P. Carman, and Adrienne S. Lavine

## EVAPORATION, BOILING, AND CONDENSATION

- 101501 Effect of Cutoff Radius on the Surface Tension of Nanoscale Bubbles /

  Ian A. Cosden and Jennifer R. Lukes
- 101502 Characterization and Modeling of the Heat Transfer Performance of Nanostructured Cu Micropost Wicks / Youngsuk Nam, Stephen Sharratt, Gilhwan Cha, and Y. Sungtaek Ju
- 101503 Turbulent Mixed Convection Inside a Vertical Tube With Wetted Wall / X. Chesneau, S. Abide, and B. Zeghmati
- 101504 Prediction of PF-5060 Spray Cooling Heat Transfer and Critical Heat Flux / **Bahman Abbasi and Jungho Kim**
- 101505 The Formation of Banded Condensate Films in Weak Ammonia Water Mixtures / **Joe Deans and Serhan Kucuka**
- 101506 Nucleate Pool Boiling Heat Transfer Measurement and Flow Visualization for Ammonia-Water Mixture / A. Sathyabhama and T. P. Ashok Babu

#### FORCED CONVECTION

- 101701 Heat Transport by Inverse-Piezoelectric Driven Dream Pipe / **Masao Furukawa**
- 101702 Entrance and Temperature Dependent Viscosity Effects on Laminar Forced Convection in Straight Ducts With Uniform Wall Heat Flux / Stefano Del Giudice, Stefano Savino, and Carlo Nonino

## **HEAT EXGHANGERS**

- 101801 Experimental Investigation of Fouling Behavior of 90/10 Cu/Ni Tube by Heat Transfer Resistance Monitoring Metod / M. Izadi, D. K. Aidun, P. Marzocca, and H. Lee
- 101802 Heat Transfer and Flow Resistance Characteristics of Louver Fin Geometry for Automobile Applications / **Hie Chan Kang and Gil Woong Jun**

#### MELTING AND SOLIDIFICATION

102301 A Study on the Importance of Natural Convection During Solidification in Rectangular Geometry / Mehmet Akif Ezan, Aytunc Erek, and Ibrahim Dincer

## RADIATIVE HEAT TRANSFER

102701 SLW-1 Modeling of Radiative Heat Transfer in Nonisothermal Nonhomogeneous Gas Mixtures With Soot / Vladimir P. Solovjov, Denis Lemonnier, and Brent W. Webb

## TWO - PHASE FLOW AND HEAT TRANSFER

102901 Heat Transfer and Fluid Flow Characteristics of Nonboiling Two - Phase Flow in Microchannels / **Kyosung Choo and Sung Jin Kim** 

## MAX JAKOB AWARD PAPER

103001 Conjugate Heat Transfer Within a Heterogeneous Hierarchical Structure / **Ivan Catton** 

- 104501 Experimental Determination of Spectral Transmittance of Porous Cerium Dioxide in the Range 900–1700 nm / **Krithiga Ganesan and Woiciech Lipiński**
- 104502 Turbulent Heat Transfer Over a Moving Surface Due to Impinging Slot Jets / **Himadri Chattopadhyay and Ali Cemal Benim**
- 104503 Forced Convection Along the Wavy Surfach / Chao-Kuang Chen, Yue-Tzu Yang, and Kuei-Hao Chang
- 104504 Robust Thermal Performance of a Flat-Plate Oscillating Heat Pipe During High-Gravity Loading / S. M. Thompson, A. A. Hathaway, C. D. Smoot, C. A. Wilson, H. B. Ma, R. M. Young, L. Greenberg, B. R. Osick, S. Van Campen, B. C. Morgan, D. Sharar, and N. Jankowski

## **REVIEW ARTICLES**

110801 A Review of High-Heat-Flux Heat Removal Technologies / M. A. Ebadian and C. X. Lin

#### **RESEARCH PAPERS**

#### CONDUCTION

111301 Combining Integral Transforms and Bayesian Inference in the Simultaneous Identification of Variable Thermal Conductivity and Thermal Capacity in Heterogeneous Media / Carolina P. Naveira-Cotta, Helcio R. B. Orlande, and Renato M. Cotta

## EVAPORATION, BOILING, AND CONDENSATION

- Pool Boiling Characteristics of Metallic Nanofluids / K. Hari Krishna, Harish Ganapathy, G. Sateesh, and Sarit K. Das
- 111502 Combined Radiation-Evaporation Model of a Liquid Droplet Layer in Spac / **Hong Ye and Yu-Long Ma**

#### FORCED CONVECTION

- 111701 Prediction of Turbulent Convective Heat Transfer to Supercritical CH<sub>4</sub>/N<sub>2</sub> in a Vertical Circular Tube / **Zhongxuan Du, Wensheng Lin, and Anzhong Gu**
- 111702 Convective Heat Transfer in a Rotor–Stator System Airgap With a Centered Natural Suction of Fluid / **Julien Pellé and Souad Harmand**
- 111703 Experimental Study on Single-Phase Gas Flow in Microtubes / T. T. Zhang, L. Jia, C. W. Li, L. X. Yang, and Y. Jaluria

## **HEAT EXCGANGERS**

- 111801 Thermal Assessment of Forced Convection Through Metal Foam Heat Exchangers / A. Tamayol and K. Hooman
- Obtaining Closure for Fin-and-Tube Heat Exchanger Modeling Based on Volume Averaging Theory (VAT) / Feng Zhou, Nicholas E. Hansen, David J. Geb, and Ivan Catton

### HEAT TRANSFER ENHANCEMENT

111901 Heat Transfer and Pressure Drop Correlations for Square Channels With V-Shaped Ribs at High Reynolds Numbers / Nawaf Y. Alkhamis, Akhilesh P. Rallabandi, and Je-Chin Han

## MICRO/NANOSCALE HEAT TRANSFER

- 112401 Interpolation Between the Acoustic Mismatch Model and the Diffuse Mismatch Model for the Interface Thermal Conductance: Application to InN/GaN Superlattice / M. Kazan
- 112402 Modeling of Thermally Driven Resonance at Multiscales / P. Srinivasan and S. Mark Spearing

## NATURAL AND MIXED CONVECTION

112501 Scaling Analysis of the Unsteady Natural Convection Boundary Layer Adjacent to an Inclined Plate for Pr > 1 Following Instantaneous Heating / Suvash C. Saha, Feng Xu, and Md Mamun Molla

112502 Energy Conservative Dissipative Particle Dynamics Simulation of Natural Convection in Liquids / **Eiyad Abu-Nada** 

#### POROUS MEDIA

- 112601 Restrictions on the Validity of the Thermal Conditions at the Porous-Fluid Interface — An Exact Solution / **Kun Yang and Kambiz Vafai**
- 112602 Exact Solutions for a Thermal Nonequilibrium Model of Fluid Saturated Porous Media Based on an Effective Porosity / F. Kuwahara, C. Yang, K. Ando, and A. Nakayama
- 112603 Fluid Flow and Heat Transfer Within a Single Horizontal Fracture in an Enhanced Geothermal System / Rosemarie Mohais, Chaoshui Xu, and Peter Dowd
- 112604 Extension of the FLASH Method to Semitransparent Polymer Foams / R. Coquard, J. Randrianalisoa, S. Lallich, and D. Baillis

- 114501 Numerical Simulation of Hydrogen–Air Boundary Layer Flows Augmented by Catalytic Surface Reactions / M. M. M. Abou-Ellail, T. W. Tong, and Y. Li
- 114502 Modeling of Polarization-Specific Phonon Transmission Through Interfaces / **Zhen Huang, Jayathi Y. Murthy, and Timothy S. Fisher**

EVAPORATION, BOILING, AND CONDENSATION

- 121501 Modeling and Analysis of Supercritical Startup of a Cryogenic Loop Heat Pipe / Lizhan Bai, Guiping Lin, G. P. Peterson, and Dongsheng Wen
- 121502 Thermal Behavior Analysis of Wire Mini Heat Pipe / Kleber Vieira de Paiva, Marcia Barbosa Henriques Mantelli, and Leonardo Kessler Slongo

## FORCED CONVECTION

- 121701 Experimental and Numerical Investigation Into the Heat Transfer Study of Nanofluids in Microchannel / Pawan K. Singh, P. V. Harikrishna, T. Sundararajan, and Sarit K. Das
- 121702 Heat Transfer Characteristics of Liquid Flow With Micro-Encapsulated Phase Change Material: Numerical Study / R. Sabbah, J. Seyed-Yagoobi, and S. Al-Hallaj

#### **HEAT EXCHANGERS**

121801 Determination of the Number of Tube Rows to Obtain Closure for Volume Averaging Theory Based Model of Fin-and-Tube Heat Exchangers / Feng Zhou, Nicholas E. Hansen, David J. Geb, and Ivan Catton

#### HEAT TRANSFER ENHANCEMENT

121901 Thermal Characteristics in a Curved Rectangular Channel With Variable Cross-Sectional Area / **Avijit Bhunia and C. L. Chen** 

## JETS, WAKES, AND IMPINGEMENT COOLING

- 122201 Numerical Simulations and Experimental Characterization of Heat Transfer From a Periodic Impingement of Droplets / Mario F. Trujillo, Jorge Alvarado, Eelco Gehring, and Guillermo S. Soriano
- 122202 Heat Transfer Characteristics of an Impinging Jet in Crossflow / Lei Wang, Bengt Sundén, Andreas Borg, and Hans Abrahamsson
- 122203 Measurement and Modeling of Confined Jet Discharged Tangentially on a Concave Semicylindrical Hot Surface / **Mohammad O. Hamdan, Emad Elnajjar, and Yousef Haik**

## MICRO/NANOSCALE HEAT TRANSFER

122401 Effect of Phonon Dispersion on Thermal Conduction Across Si/Ge Interfaces / **Dhruv Singh, Jayathi Y. Murthy, and Timothy S. Fisher** 

## NATURAL AND MIXED CONVECTION

- 122501 Mixed Convection From a Convectively Heated Vertical Plate to a Fluid With Internal Heat Generation / **O. D. Makinde and A. Aziz**
- 122502 Effect of Double Stratification on Free Convection in a Micropolar Fluid / **D. Srinivasacharya and Ch. RamReddy**
- 122503 An Experimental Study of Natural Convection in Vertical, Open-Ended, Concentric, and Eccentric Annular Channels / G. H. Choueiri and S. Tavoularis

- 122504 Natural Convection of Cu-Gallium Nanofluid in Enclosures / Cong Qi, Yurong He, Yanwei Hu, Juancheng Yang, Fengchen Li, and Yulong Ding
- 122505 Simulation of Heat Transfer and System Behavior in a Supercritical CO<sub>2</sub>
  Based Thermosyphon: Effect of Pipe Diameter / **Lin Chen and Xin**-Rong Zhang

#### POROUS MEDIA

- 122601 Transverse Heterogeneity Effects in the Dissipation-Induced Instability of a Horizontal Porous Layer / A. Barletta, M. Celli, and A. V. Kuznetsov
- 122602 Effects of Partial Slip on the Analytic Heat and Mass Transfer for the Incompressible Viscous Fluid of a Porous Rotating Disk Flow / **Mustafa Turkyilmazoglu**

## RADIATIVE HEAT TRANSFER

122701 Multiscale Part-Spectrum *k*-Distribution Database for Atomic Radiation in Hypersonic Nonequilibrium Floks / **Ankit Bansal and Michael Modest** 

## **TECHNICAL BRIEFS**

124501 Effect of Surface Microstructure on Microchannel Heat Transfer Performance / Yang Liu, Jing Cui, WeiZhong Li, and Ning Zhang

Oprac. BPK