

PRELIMINARY PROGRAM

**INTERNATIONAL CONFERENCE
ON
POROUS MEDIA AND THEIR APPLICATIONS
IN
SCIENCE, ENGINEERING AND INDUSTRY**

**An
Engineering Foundation
&
Institute of Industrial Mathematical Sciences
Conference**

**June 16 - 21, 1996
Kona Surf Hotel
78-128 Ehukai Street
Kailua-Kona, Hawaii 96740
Phone: 1-808-322-3411
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- [Monday, June 17](#)
- [Tuesday, June 18](#)
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- [Poster Session I](#)
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Sunday, June 16, 1996

4:00 pm - 7:00 pm
Registration

6:00 pm - 7:30 pm
Dinner

7:30 pm - 7:45 pm

Opening Remarks

Conference Co-Chairs:

Kambiz Vafai & Pappur Shivakumar

Engineering Foundation Liaison:

Frank Schmidt

7:45 pm - 8:45 pm

KEYNOTE: TBA

8:45 pm - 10:45 pm

Opening Reception

Monday, June 17, 1996

7:00 am - 8:15 am

Breakfast

8:15 am - 8:30 am

SESSION I: Natural and Forced Convection in Porous Media

Session Chairs: Serge A. Bories and Marcello de Lemos

8:30 am - 9:00 am "The Effect of Inertia on the Stability of Convection in a Porous Layer Heated from Below"

David A.S. Rees

University of Bath, United Kingdom

9:00 am - 9:30 am

"The Effect of Fluid Inertia on the Onset of Unsteady Convection in a Saturated Porous Layer Heated From Below"

Robin Strange

University of Bath, United Kingdom

9:30 am - 10:00 am

"Heat Transfer Due to Pulsating Flow Through a Pipe Partially Filled With a Porous Medium"

Hyung Jin Sung

Korea Advanced Institute of Science and Technology, Korea

10:00 am - 10:30 am

Coffee Break

10:30 am - 11:00 am

"An Analytical Study of Forced Convection in a Porous Medium"

Donald A. Nield

University of Auckland, New Zealand

11:00 am - 11:30 am

"Effect of Gravity Modulation on the Onset of Convection in a Porous Layer"

M.S. Malashetty

Gulbarga University, India

11:30 - 12:00 noon

"Unsteady Forced Convection Boundary Layer Flow Through Saturated Porous Media"

Nurzahan Banu

University of Dhaka, Bangladesh

12:00 noon - 1:30 pm

Lunch

1:30 pm - 6:00 pm

Ad hoc Sessions/Free Time

6:00 pm - 7:15 pm

Dinner

7:15 pm - 7:30 pm

SESSION II: Multiphase Flow and Heat Transfer

Session Chairs: Stephen Whitaker and Francis Dullien

7:30 pm - 8:00 pm

"Capillary Effects and Multiphase Flow in Porous Media"

Francis A.L. Dullien

University of Waterloo, Canada

8:00 pm - 8:30 pm

"Phase Change Phenomena in Porous Media Driven by Mass Transfer"

Marc Prat

Institut de Mecanique des Fluides de Toulouse, France

8:30 pm - 9:00 pm

"A Review of Enhanced Vapor-Phase Diffusion Mechanisms, Models and Data - Does Enhanced Vapor-Phase Diffusion Exist?"

Stephen Webb

Sandia National Laboratories Albuquerque, USA

9:00 pm - 9:30 pm

"Studies of Axial Dispersion in Single and Two Phase Flow in Porous Media"

Mohammad Jamialahmadi

University of Petroleum Industry, Iran

9:30 pm - 10:00 pm

"Packed-Bed Heat Exchanger with a Two-Phase Matrix"

Maria Martins-Costa

10:00 pm - 11:00 pm

Social Hour

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Tuesday, June 18, 1996

7:00 am - 8:15 am

Breakfast

8:15 am - 8:30 am

SESSION III: Advanced Mathematical Approaches to Modeling and Numerical Techniques

Session Chairs: N. Rudraiah and John Georgiadis

8:30 am - 9:00 am

"Advanced Modeling of Packed Bed Chemical Reactors"

D. Vortmeyer

Technische Universitat Munchen, Germany

9:00 am - 9:30 am

"Momentum & Energy Conditions at the Boundary Between a Porous Medium and a Homogeneous Fluid"

Stephen Whitaker

University of California - Davis, USA

9:30 am - 10:00 am

"Mathematical Modeling of Non-Darcian Radiative-Convective Boundary Layer Heat Transfer From a Vertical Flat Porous Plate in a Fluid-Saturated Porous Medium with Transverse Magnetic Field"

H.S. Takhar

University of Manchester, United Kingdom

10:00 am - 10:30 am

Coffee Break

10:30 am - 11:00 am

"A Numerical Modeling of Turbulent Flow in Porous Media Using a Spatially Periodic Array"

Akira Nakayama

Shizuoka University, Japan

11:00 am - 11:30 am

"Deep Hydrothermal Systems: Mathematical Modeling of Hot Dense Brines Containing Non-Condensable Gases"

Robert McKibbin

Massey University, New Zealand

11:30 am - 12:00 noon

"On the Application of the Pontryagin's Formalism to Solution of an Optimal Control Problem for a Porous Slab"

A.V. Kuznetsov

Technical University of Vienna, Austria

12:00 noon - 1:30 pm

Lunch

1:30 pm - 6:00 pm

Ad hoc Sessions/Free Time

6:00 pm - 7:15 pm

Dinner

7:15 pm - 7:30 pm

SESSION IV: Effective Properties

Session Chairs: Ping Cheng and G. Lauriat

7:30 pm - 8:00 pm

"The Effective Stagnant Thermal Conductivity of Porous Media With Periodic Structures"

Ping Cheng

Hong Kong University of Science & Technology, Hong Kong

8:00 pm - 8:30 pm

"Effective Thermal Conductivities in Self-Similar Porous Media"

Boming Yu

Huazhong University of Science and Technology, P.R. China

8:30 pm - 9:00 pm

"Turbulent Flow and Heat Transfer in High Permeability Porous Media"

Ivan Catton

University of California, Los Angeles, USA

9:00 pm - 10:00 pm

Poster Session I: Transport Through Porous Media

and concurrent Social Hour

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Wednesday, June 19, 1996

7:00 am - 8:15 am

Breakfast

8:15 am - 8:30 am

SESSION V: Experimental and Measuring Techniques

Session Chairs: Dieter Vortmeyer and Hirotohi Kubota

8:30 am - 9:00 am

"Experimental Evidence for Permeability Minima at Low-Velocity Gas Flow Through Porous Media"

Rudolf Meyer

University of Calgary, Canada

9:00 am - 9:30 am

"Electrochemical Characterization of Porous Media"

Jan Myland
Trent University, Canada

9:30 am - 10:00 am

"Flow and Temperature Visualization of Centrifugally Driven Free Convection in a Rotating Hele-Shaw Cell"

Peter Vadasz
University of Durban-Westville, South Africa

10:00 am - 10:30 am

Coffee Break

10:30 am - 11:00 am

"Experimental and Numerical Analysis of Drying of Particles in Superheated Steam"

Lounes Tadrist
I.U.S.T.I. UMR 139, France

11:00 am - 11:30 am

"Quantification of Soil Macropores by Computer Assisted Tomography"

Johan Perret
McGill University, Canada

11:30 am - 12:00 noon

"Classification of One-Dimensional Steady-State Two-Phase Geothermal Flows"

Roger M. Young
N.Z. Institute for Industrial Research and Development, New Zealand

12:00 noon - 1:30 pm

Lunch

1:30 pm - 6:00 pm

Ad hoc Sessions/Free Time

6:00 pm - 7:15 pm

Dinner

7:15 pm - 7:30 pm

SESSION VI: Industrial and Environmental Heat Transfer and Fluid Flow

Session Chairs: Ivan Catton and Charles Hickox

7:30 pm - 8:00 pm

"Thermal Protection System with use of Porous Media for Hypersonic Reentry Vehicle"

Hirotoishi Kubota
University of Tokyo, Japan

8:00 pm - 8:30 pm

"Direct Simulation of Interstitial Velocity Fields in Large Randomly Packed Beds on the Connection Machine"

John Georgiadis
University of Illinois, USA

8:30 pm - 9:00 pm

"Study of Mechanisms Resulting in Enhanced Production Induced by Wellbore Cavitation"

Hans H. Vaziri

Technical University of Nova Scotia, Canada

9:00 pm - 9:30 pm

"A Thermal Mixing Model in Tube Bundles for Use With the Porous Body Approximation"

John Ashcroft

KAPL Inc., NY, USA

9:30 pm - 10:00 pm

"Numerical Simulation of Filter Cake Build-Up for Surface Filters"

Ansgar Christ

RWTH Aachen, Germany

10:00 pm - 11:00 pm

Social Hour

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Thursday, June 20, 1996

7:00 am - 8:15 am

Breakfast

8:15 am - 8:30 am

SESSION VII: Reactive Flows and Radiation Heat Transfer

Session Chairs: Massoud Kaviany and M.H. Hamdan

8:30 am - 9:00 am

"Modelling of Combustion in Porous Media"

Massoud Kaviany

University of Michigan, USA

9:00 am - 9:30 am

"Reactive Liquid Composite Molding"

James Lee

Ohio State University, USA

9:30 am - 10:00 am

"The Reaction-Infiltration Instability"

John Chadam

The Fields Institute for Research in Mathematical Sciences, Canada

10:00 am - 10:30 am

Coffee Break

10:30 am - 11:00 am

"Numerical Simulation of Unsteady Reactive Flows in Porous Media"

Fengjee Peter Tsai

Pacific-Sierra Research Co., USA

11:00 am - 12:00 noon

Poster Session II: Applications and Modeling Approaches

12:00 noon - 1:15 pm

Lunch

1:15 pm - 1:30 pm

SESSION VIII: Combined Heat and Mass Transfer

Session Chairs: Vladimir Nakoryakov and Abdelkader Mojtabi

1:30 pm - 2:00 pm

"Recent Advances in Numerical Techniques Applied to Flow, Heat and Mass Transfer in Porous Media"

Marcelo J.S. de Lemos

IEME/ITA/CTA, Brazil

2:00 pm - 2:30 pm

"Convective Acceleration of Mass Transfer in Porous Catalysts by Pressure Oscillations"

J.C. van den Heuvel

University of Amsterdam, The Netherlands

2:30 pm - 3:00 pm

"Onset of Thermosolutal Convective Regime in Rectangular Porous Cavity"

Marie-Catherine Charrier-Mojtabi

Universite Paul Sabatier, France

3:00 pm - 3:30 pm

"Deep Bed Filtration of Molten Metals"

Bogdan Venescu

Worcester Polytechnic Institute, USA

3:30 pm - 4:00 pm

Break

4:00 pm - 4:30 pm

"Filling of Porous Media in Materials Processing Applications"

B. Minaie

University of Massachusetts-Lowell, USA

4:30 pm - 5:00 pm

"Fluid Flow and Heat Transfer in Porous Media"

V.E. Nakoryakov

Russian Academy of Sciences, Russia

5:00 pm - 6:00 pm

Poster Session III: Multiphase Transport in Porous Media

and Concurrent Social Hour

6:00 pm - 7:00 pm

Free Time

7:00 pm

Luau at Keauhou Beach Hotel

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Friday, June 21, 1996

7:00 am - 8:15 am

Breakfast

8:15 am - 8:30 am

SESSION IX: Natural and Forced Convection in Porous Media

Session Chairs: W.J. Minkowycz and Hamid Hadim

8:30 am - 9:00 am

"Rayleigh-Taylor Instability in a Finite Thickness Fluid-Saturated Porous Layer"

N. Rudraiah

Gulbarga University, India

9:00 am - 9:30 am

"Issues Involved in the Numerical Simulation of Coupled Viscous and Porous Flow"

Charles E. Hickox

Sandia National Labs, New Mexico, USA

9:30 am - 10:00 am

"Numerical Study of Non-Darcy Forced Convection on a Power-Law Fluid in a Packed Bed"

Hamid A. Hadim

Stevens Institute of Technology, Hoboken, NJ, USA

10:00 am - 10:30 am

Coffee Break

10:30 am - 11:00 am

"Heat Transfer With or Without Phase Change in a Sintered Fibrous Medium"

Marc Miscevic

Laboratoire de l'Institut Universitaire des Systemes Thermiques Industriels (IUSTI), France

11:00 am - 12:00 noon

Lunch and Adjournment

(Boxed Lunches will be available for those who request them by Wednesday evening)

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Poster Session I

Tuesday, June 18, 1996

9:00 PM - 10:00 PM

Transport Through Porous Media

"High Wavenumber Convection in Tall Porous Containers Heated From Below"

Sam Lewis, University of Bath, United Kingdom

"The Effect of Inertia on the Stability of Darcy-B'enard Convection"

D.A.S. Rees, University of Bath, United Kingdom

"Natural Convection of Newtonian and Non-Newtonian Fluids in a Heterogeneous Anisotropic Porous Bed"

Fengjee Peter Tsai, Pacific-Sierra Research Co., CA, USA

"Driven Convection in a Horizontal Infinite Porous Layer"

M.C. Neel, Universite Paul Sabatier, France

"An Analysis of Natural Convection in Open Cavities Filled With a Porous Medium"

Oronzio Manca, Seconda Universita degli studi di Napoli, Italy

"Mitigation of Water Wave Impact with Porous Obstacles"

Peter E. Raad, Southern Methodist University, USA

"Experimental Study of Heat Transfer in Porous Structures"

B.M. Galitseisky, Moscow Aviation Institute, Russia

"Spectral Method Applied to Convection in Porous Media"

M. Azaiez, Universite Paul Sabatier, France

"Non-Darcian Effects on Convective Instability in Porous Media with Throughflow"

I.S. Shivakumara, Central College Bangalore University, India

"Convection Induced by Inclined Gradients in a Shallow Porous Medium Layer"

J.L. Lage, South Methodist University, USA

"Heat Transfer Studies in Packed Beds: Effect of Pellet Geometry"

S.M. Mak, University of Teesside, United Kingdom

"On Closure Modeling for Volume Averaged Transport Equations"

Prieur du Plessis, University of Stellenbosch, South Africa

"Turbulent Phenomena in Flow through Porous Media"

Takashi Masuoka, Kyushu Institute of Technology, Japan

"Flow and Heat Transfer in Deformable Porous Medium"

Kambiz Vafai, Ohio State University, USA

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Poster Session II

Thursday, June 20, 1996

11:00 AM - 12 NOON

Applications and Modeling Approaches

"Continuum Modeling of Single Phase Packed Bed Flow"

Shijie Liu, University of Alberta, Canada

"Superadiabatic Combustion in Porous Media and its Application"

S.A. Zhdanok, A.V. Luikov Heat and Mass-Transfer Inst., Belarus

"Use of Porous Inserts in Heat Transfer Enhancement in Cooling Channels"

M. Sozen, Southern University, USA

"Mathematical Modeling of a Sewage Sludge Incineration and Ash Melting Furnace with Coke-packed Bed"

Jiabing Wang, Ryutai Consultants Co. Ltd., Japan

"Study of Flow and Heat Exchange in Channel With High-Porous Cellular Materials for Force Convection of Single-Phase and Boiling Heat-Transfer Fluid"

Yu. F. Gortyshov, Kazan State University, Russia

"Two-Scale Modeling of Clays"

Bogdan Vernescu, Worcester Polytechnic Institute, MA, USA

"Porosity of Randomly Packed Beds of Rigid Fibers: An Experimental Study"

Lounes Tadrist, I.U.S.T.I. UMR 139, France

"A Numerical Investigation of Electroconductive Heating in Solid-Liquid Mixtures"

Sudhir Sastry, Ohio State University, USA

"Experimental and Computation Study of Laminar Entrained Flow Reactor on Pulverized Coal Combustion"

Zhiguo Zhang, National Coal Combustion Laboratory, P.R. China

"An Aquifer-Well Thermofluid Model to Design a Down Heat Exchanger"

Giorgio Buonanno, Universita Degli Studi de Cassino, Italy

"A Study on the Shapes of a Bubble Attached to a Tip in a Uniform and a Nonuniform Electric Field"

H.J. Cho, POSTECH, Korea

"Filling and Releasing Kinetics of Pores by Particles"

B. Khuzhayorov, Samarkand State University, Uzbekistan

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Poster Session III

Thursday, June 20, 1996

5:00 PM - 6:00 PM

Multiphase Transport in Porous Media

"Modeling of a Capillary Evaporator"

Chao-Yang Wang, University of Hawaii at Manoa, USA

"Heat and Mass Transfer in a Packed Bed with Cocurrent Two-Phase Flow"

V.V. Kuznetsov, Russian Academy of Sciences, Russia

"Enhancement of Two-Phase Flow Heat Transfer in Channel with Porous Insert"

Yu A. Zeigarnik, Russian Academy of Sciences, Russia

"Drying Process in a Porous Medium with Non-Penetrating Heating Surface"

S. Lin, Concordia University, Canada

"Constitutive Equations to Model the Relationship Between Saturation, Vapor Pressure and Capillary Pressure in Porous Building Materials"

Fabio Peron, Instituto Universitario di Architettura di Venezia, Italy

"Electrical Alternating Current Effects on Flow of Oil and Water in Porous Media"

Osvair V. Trevisan, Universidade Estadual de Campinas, Brazil

"A Model for Calculating Effective Diffusion Coefficient in Micropore of 13X Zeolite"

Ren Xiaoguang, Liaoyang Petrochemical Engineering Institute, China

"Transient Non-darcy Film Condensation Porous Media"

Carlos Daniel Ebinuma, Sao Paulo State University, Brazil

"Computation of Reactive Flows in a Porous Bed With and Without Radiative Heat Transfer"

Fengjee Peter Tsai, Pacific-Sierra Research Co., California, USA

"Gas-Phase Diffusion in Porous Media-Evaluation of and Advective-Dispersive Formulation and the Dusty-Gas Model"

Stephen Webb, Sandia National Laboratories Albuquerque, NM, USA

"Mathematical Theory for Two-Phase Displacement with Hysteresis"

Pavel G. Bedrikovetsky, CENPES, DIGER, Cidade Universitaria, Brazil

"A New Mathematical Theory for 1-Phase Multicomponent Transport in Fractured Porous Media"

Pavel G. Bedrikovetsky, CENPES, DIGER, Cidade Universitaria, Brazil

"Visualization of Phase Change Mechanism in Porous Media with Forced Flow"

Lounes Tadrist, I.U.S.T.I. UMR 139, France

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