Preliminary Program
(March 17, 2016)

6th International Conference on Porous Media and Its Applications in Science, Engineering and Industry

An ECI Conference Series

July 3-8, 2016
Hilton Waikoloa Village
Waikoloa, Hawaii, USA

Conference Chair
Kambiz Vafai
University of California, Riverside, CA USA

Co-Chairs
Adrian Bejan
Duke University, Durham, NC USA

Oronzio Manca
Seconda Universita degli Studi Napoli, Italy

Akira Nakayama
Shizuoka University, Japan
Sunday, July 3, 2016

17:00 - 20:00  Conference Check-in

18:30 - 20:30  Welcome Reception and Dinner

Notes

- Taping and photography of any presentations are prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Please write your name on your program so that it can be returned to you if it is lost.
- After the conference, ECI will send an updated participant list to all participants. Please check your listing, and if it needs updating, you may correct it at any time by logging into your ECI account.
Monday, July 4, 2016

07:00 - 08:00 Breakfast

08:00 - 08:05 Welcome Remarks
Chair: Kambiz Vafai, University of California, Riverside, USA

08:05 - 08:10 Introductory Remarks
ECI Technical Liaison: Lawrence Kabacoff, USA

08:10 - 09:00 Keynote Talk - TBD

Oral Session 1: Natural and forced convection in porous media (I)
Chair: Moran Wang, Tsinghua University, China

09:00 - 09:25 Thermal radiation effect on fully developed laminar mixed convection flow in a vertical porous stratum by using differential transform method
Patil Mallikarjun B, Tumkur University, Tumakuru, India

09:25 - 09:50 Phenomenological model of laminar flow through heterogeneous porous media: An asymptotic approach
Sid Becker, University of Canterbury, New Zealand

09:50 - 10:15 Fluid flow in Porous Media
Hooman Fallah, Islamic Azad University, Iran

10:15 - 10:45 Coffee break

Oral Session 2: Material processing applications
Chair: Mileva Radonjic, Louisiana State University, USA

10:45 - 11:10 The influence of cold rolling on the pore morphology and flow resistivity of porous aluminum
Nicolas Lippitz, Institute for Materials - TU Braunschweig, Germany

11:10 - 11:35 Optimizing microbially induced calcite precipitation under radial flow conditions
Robin Gerlach, Montana State University, USA

11:35 - 12:00 Experimental research on internal convection heat transfer of supercritical pressure CO₂ in porous media
Le Zhang, Tsinghua University, China

12:00 - 12:25 Micro-nano scales flowing simulation in shale gas
Tiantian Zhang, Southwest Petroleum University, China
12:25 - 12:50  Nano- and microscale characterization of multiporous granular material  
Katherine L. Hull, Aramco Research Center-Houston, USA

12:50 - 13:15  Improved description of mechanisms of particulate mobilization, migration, and retention processes in natural porous materials  
Faruk Civan, University of Oklahoma, USA

13:15 - 16:15  Lunch on your own / ad hoc sessions / free time

**Oral Session 3: Industrial and environmental heat transfer and flow in porous media (I)**
Chair: Andrey V. Kuznetsov, North Carolina State University, USA

16:15 - 16:40  Analysis of porous media heat transfer augmentation in a supercritical CO$_2$ compact heat exchanger  
Kevin Andersron, Calif. State Polytechnic University at Pomona, USA

16:40 - 17:05  Numerical study of flame stabilization in a recuperative porous media burner for VOCs oxidation  
Valeri Bubnovich, Universidad de Santiago de Chile, Chile

17:05 - 17:30  Advances in groundwater hydraulics and flow  
Walter W. Loo, Environment & Technology Services, USA  
Isen Wang, Environment & Technology Services, USA  
Dale Markley, Mantec Corp, USA

17:30 - 18:00  Coffee break

18:00 - 18:25  Temperature-dependent relative permeability model for heavy oil/water system  
Chao Huang, Tsinghua University, China

18:25 - 18:50  Physical modeling of big channel formation process in unconsolidated sandstone oil reservoir  
Jianjun Liu, Southwest Petroleum University, China

18:50 - 19:15  High temperature thermochemical energy storage using a porous reactor  
Qasim Ranjha, Lehigh University, USA

19:30 - 21:00  Dinner

21:00 - 22:30  Poster session and social hour
Tuesday, July 5, 2016

07:00 - 08:00  Breakfast

08:00 - 08:50  Keynote Talk - TBD

**Oral Session 4: Natural and forced convection in porous media (II)**
**Chair:** Boming Yu, Huazhong University of Science and Technology, China

08:50 - 09:15  **Stokes flow past a two-layers heterogeneous porous sphere with the effect of stress jump condition: An exact solution**
Kun Yang, School of Energy and Power Engineering, Huazhong University of Science and Technology, China
Kambiz Vafai, Department of Mechanical Engineering, University of California, Riverside, USA

09:15 - 09:40  **Modeling and simulation of nanofluid transport in heterogeneous porous media**
Elsayed R. Abdelfatah, University of Oklahoma, USA

09:40 - 10:05  **Mathematical modeling of MHD free convection process along a vertical wavy surface in a doubly stratified non-Darcy fluid flow saturated porous medium under the influence of Soret and Dufour effects**
Krishna Murthy Somanchi, Defence Institute of Advanced Technology, Pune, India

10:05 - 10:35  Coffee break

10:35 - 11:00  **Time fractional transport model for flow through tight porous media**
Nadeem A. Malik, King Fahd University of Petroleum and Minerals, Saudi Arabia

11:00 - 11:25  **Exact solution for viscous fluid flow in porous medium with magnetic field**
Dinesh PA, M. S. Ramaiah Institute of Technology, India

**Oral Session 5: Experimental and measuring techniques**
**Chair:** Session Chair TBD

11:25 - 11:50  **An experimental investigation on effect of pores per inch in compact heat exchanger with aluminum foam**
Oronzio Manca, Dipartimento di Ingegneria Industriale e dell'Informazione Seconda Università di Napoli - DIII, Italy

11:50 - 12:15  **Velocity structures in 2D porous micromodels: A micro-PIV study**
Farzan Kazemifar, University of Notre Dame, USA
Tuesday, July 5, 2016 (continued)

12:15 - 12:40  
Experimental comparison between permeation into and through a porous material  
Zachary Grasley, Texas A&M University, USA

12:40 - 13:05  
Experimental investigation of combined transpiration and jet cooling of sintered metal porous struts  
Gan Huang, Tsinghua University, China

13:05 - 13:30  
Extreme computing meets mesoscale science: High resolution simulation of pore scale reactive transport  
David Trebotich, Lawrence Berkeley National Laboratory, USA

13:30  
Lunch on your own / ad hoc sessions / free time

19:30  
Dinner on your own
Wednesday, July 6, 2016

07:00 - 08:00  Breakfast

08:00 - 08:50  Keynote Talk - TBD

**Oral Session 6: Bio transport in porous media (I)**
Chair: Session Chair TBD

08:50 - 09:15  Shear-induced migration and secondary flows on red blood cells transport in the feto-placental vasculature system: Consideration on oxygen transport
Parisa Mirbod, Clarkson University, USA

09:15 - 09:40  Effective transport properties of drug delivery systems: Porous granules and tablets
Frantisek Stepanek, University of Chemistry and Technology, Prague, Czech Republic

09:40 - 10:05  Tissue electroporation and cellular drug delivery: The influence of irreversibly electroporated cells
Sid Becker, University of Canterbury, New Zealand

10:05 - 10:35  Coffee break

10:35 - 11:00  Bioconvection of nanofluid past stretching sheet in a porous medium in presence of gyrotactic microorganisms and partial slip
Alireza noghrehabadi, Pars Development of Soil and Water Engineering, Iran

11:00 - 11:25  Effect of partial slip boundary condition on bioconvection of nanofluid past stretching sheet due to gyrotactic microorganisms
Rashid Pourrajab, Shohadaye Hoveizeh University of Technology, Iran

**Oral Session 7: Advances in numerical techniques (I)**
Chair: Session Chair TBD

11:25 - 11:50  Direct numerical simulation of reactive flow through a fixed bed of catalyst particles
Abdelkader Hammouti, IFP Energies Nouvelles, France

11:50 - 12:15  Simulation on turbulence characteristics in three-dimensional randomly and regularly packed bed
Linsong Jiang, Dalian University of Technology, China

12:15 - 12:40  Large eddy simulation of methane-air premixed turbulent combustion in porous media
Meng Yue, Dalian University of Technology, China
Wednesday, July 6, 2016 (continued)

12:40 - 15:00
Lunch on your own / ad hoc sessions/ free time

Oral Session 8: Combined heat and mass transfer in porous media
Chair: Session Chair TBD

15:00 - 15:25
Reservoir simulations of shale gas in tight rocks using a non-linear transport model with fully pressure dependent model parameters
Nadeem Malik, King Fahd University of Petroleum and Minerals, Saudi Arabia

15:25 - 15:50
Gas effective diffusion coefficient in porous media by mesoscopic modeling
Moran Wang, Tsinghua University, China

15:50 - 16:15
Numerical simulation of thermal energy storage with phase change material and aluminum foam
Oronzio Manca, Seconda Universita' degli Studi di Napoli, Italy

16:15 - 16:40
Combined effects of internal heat generation and viscous dissipation for double diffusive with Forchheimer fluid model
P.A. Dinesh, Ramaiah Institute of Technology, India

16:40 - 17:05
Internal heat generation effect on mixed convection heat and mass transfer over a vertical heated plate with Soret and Dufour effects
P.A. Dinesh, Ramaiah Institute of Technology, India

17:05 - 17:35
Coffee break

Oral Session 9: Advances in numerical techniques (II)
Chair: Session Chair TBD

17:35 - 18:00
A pragmatic approach of computational methods for simulation of multiphase flows
Arup Borah, R G Baruah College, India

18:00 - 18:25
Numerical investigation of the phase change in transpiration cooling with the VOF method
Xiao-Long Ouyang, Tsinghua University, China

18:25 - 18:50
A mini-review on the Fractal-Monte Carlo method and its applications in porous media
Boming Yu, Huazhong University of Science and Technology, China

18:50 - 19:15
Fractal characterization of microstructures and properties of dynamically evolving porous media
Atul Verma, Virginia Tech, USA
Modelling the effect of the porous support on the flux through asymmetric oxygen gas separation membranes
Robert Mücke, IEK-1, Forschungszentrum Jülich, Germany

Dinner

Poster session and social hour
**Thursday, July 7, 2016**

07:00 - 08:00  Breakfast

08:00 - 08:50  Keynote Talk - TBD

**Oral Session 10: Bio transport in porous media (II)**  
**Chair:** Session Chair TBD

08:50 - 09:15  Modeling flow, heat and mass transfer in a porous biomass plug - when used in an electrically heated tobacco system  
Markus Nordlund, Philip Morris Products S.A., Switzerland

09:15 - 09:40  An innovative culture technique for microalgae using hollow fiber membranes  
Yoshihiko Sano, Shizuoka University, Japan

09:40 - 10:05  Simulating brain as an active porous medium: Application to modeling the onset of Parkinson’s disease  
Andrey V. Kuznetsov, North Carolina State University, USA

10:05 - 10:30  Effect of Newtonian heating on bioconvection of nanofluid over stretching sheet with gyrotactic microorganisms  
Aminreza Noghrehabadi, Shohadaye Hoveizeh University of Technology, Iran

10:30 - 11:00  Coffee break

**Oral Session 11: Industrial and environmental heat transfer and flow in porous media (II)**  
**Chair:** Session Chair TBD

11:00 - 11:25  Proposal of utilizing uni-directional porous copper for extremely high heat flux removal  
Kazuhisa Yuki, Tokyo University of Science, Japan

11:25 - 11:50  Generation of simple extended porous surface expression from results of pore-level conjugate heat transfer in spherical-void-phase porous blocks  
Anthony Gerald Straatman, Western University, Canada

11:50 - 12:15  Cost effective recovery of distilled water from vadose zone soil and on top of non-portable groundwater bearing strata  
Walter W. Loo, Environment & Technology Services, USA

12:15 - 12:40  Comprehensive review and unified description of pore-scale non-equilibrium relaxation effects on unsteady-state porous media processes  
Faruk Civan, University of Oklahoma, USA
Thursday, July 7, 2016 (continued)

12:40 - 13:05  
Effects on the pore structure and permeability change by coke deposition during crude oil in-situ combustion  
Qianghui Xu, Tsinghua University, China

12:30 - 12:30  
Lunch on your own

Oral Session 12: Natural and forced convection in porous media (II)  
Chair: Session Chair TBD

16:15 - 16:40  
Effect of the variable porosity on the heat transfer process in solar air receiver  
Pei Wang, Hohai University, China

16:40 - 17:05  
Comparative study of different expressions for Reynolds numbers used in porous media flow  
Pradeep Kumar Girimaji, Sri Venkateswara University, Tirupati, India

17:05 - 17:30  
Capillary driven flow of non-Newtonian fluids in nanochannels  
Neda Nazemifard, University of Alberta, Canada

17:30 - 17:55  
Boiling on hydrophobic surfaces with hydrophilic wicks  
Mohammad Reza Shaeri, Advanced Cooling Technologies, Inc, USA

17:55 - 18:20  
Effect of magnetic field on long porous rough journal bearing with a heterogeneous slip/no-slip surface  
P.A. Dinesh, Ramalah Institute of Technology, India

19:00 - 22:00  
Reception and Conference Banquet
Friday, July 8, 2016

08:00 - 09:00  Breakfast on your own

Departures