Program

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
Seconde Universita degli Studi Napoli, Italy

Akira Nakayama
Shizuoka University, Japan
Hilton Waikoloa Village
69-425 Waikoloa Beach Drive
Waikoloa, Hawaii, 96738, USA
Tel: +1-808-886-1234
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Porous Media and Its Applications in Science, Engineering and Industry Conferences History

An ECI Conference Series

Porous Media I (1996)
Kambiz Vafai, Pappur Shivakumar
Kailua-Kona, Hawaii

Porous Media II (2007)
Kambiz Vafai, Adrian Bejan, Abdul-Khader Mojtahed, Akira Nakayama
Kauai, Hawaii

Porous Media III (2010)
Kambiz Vafai, Adrian Bejan, Oronzio Manca, Akira Nakayama
Montecatini Terme, Italy

Porous Media IV (2012)
Kambiz Vafai, Adrian Bejan, Akira Nakayama
Potsdam, Germany

Porous Media V (2014)
Kambiz Vafai
Kailua-Kona, Hawaii
The conference gratefully acknowledges support from the U.S. National Science Foundation
Sunday, July 3, 2016

17:00 - 19:00  Conference Check-in (Grand Staircase)

18:00 - 20:30  Welcome Reception and Dinner (Grand Staircase)

**NOTES**

- Technical Sessions will be held Queens 4.
- Poster Session with a light lunch will be held in Kona 2.
- Breakfasts will be in the Grand Promenade South. Lunches are on your own with the exception of a light lunch being served during the Tuesday Poster Session. Dinners will be on the Grand Staircase.
- Audiotaping, videotaping and photography of 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.
- After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.
- Please do not smoke at any conference functions.
07:00 – 9:00 Breakfast

09:00 - 09:05 Welcome Remarks
Chair: Kambiz Vafai, University of California, Riverside, USA

09:05 - 09:10 Introductory Remarks
ECI Technical Liaison: Lawrence Kabacoff, USA

**Oral Session 1: Natural and forced convection in porous media**
Chair: Boming Yu, Huazhong University of Science and Technology, China

09:10 – 09:35 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

09:35 - 10:00 Time fractional transport model for flow through tight porous media
Nadeem A. Malik, King Fahd University of Petroleum and Minerals, Saudi Arabia

10:00 - 10:25 Modelling the effect of the porous support on the flux through asymmetric oxygen gas separation membranes
Robert Mücke, IEK-1, Forschungszentrum Jülich, Germany

10:25 – 10:50 Exact solution for viscous fluid flow in porous medium with magnetic field
Dinesh PA, M. S. Ramaiah Institute of Technology, India

10:50 – 11:15 Coffee break

**Oral Session 2: Material processing applications**
Chair: Nadeem A. Malik, King Fahd University of Petroleum and Minerals, Saudi Arabia

11:15 – 11:45 The influence of cold rolling on the pore morphology and flow resistivity of porous aluminum
Nicolas Lippitz, Institute for Materials – TU Braunschweig, Germany

11:45 – 12:10 Experimental research on internal convection heat transfer of supercritical pressure CO2 in porous media
Le Zhang, Tsinghua University, China

12:10 – 12:35 Micro-nano scales flowing simulation in shale gas
Boming Yu, Huazhong University of Science and Technology, China

**Oral Session 3: Experimental and measuring techniques**
Chair: Robert Mücke, IEK-1, Forschungszentrum Jülich, Germany

12:35 – 13:00 Experimental investigation of combined transpiration and jet cooling of sintered metal porous struts
Gan Huang, Tsinghua University, China

13:00 – 19:30 Lunch on your own / ad hoc sessions / free time
Monday, July 4, 2016 (continued)

19:30 – 21:30 Dinner

21:30 – 22:30 Technical discussion and social hour
07:00 – 09:00  Breakfast

**Oral Session 4: Combined heat and mass transfer in porous media**
**Chair:** Markus Nordlund, Philip Morris Products S.A., Switzerland

09:00 – 09:25  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

09:25 – 09:50  Numerical simulation of thermal energy storage with phase change material and aluminum foam
Oronzio Manca, Seconda Universita' degli Studi di Napoli, Italy

09:50 – 10:15  Combined effects of internal heat generation and viscous dissipation for double diffusive with Forchheimer fluid model
Nalinakshi Girish, Atria Institute of Technology, India

10:15 – 10:40  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

10:40 – 11:10  Coffee break

**Oral Session 5: Industrial and environmental heat transfer and flow in porous media**
**Chair:** Oronzio Manca, Seconda Universita' degli Studi di Napoli, Italy

11:10 - 11:35  Proposal of utilizing uni-directional porous copper for extremely high heat flux removal
Kazuhisa Yuki, Tokyo University of Science, Japan

11:35 - 12:00  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

12:00 - 12:25  Effects on the pore structure and permeability change by coke deposition during crude oil in-situ combustion
Qianghui Xu, Tsinghua University, China

12:25 – 12:50  Effect of the variable porosity on the heat transfer process in solar air receiver
Pei Wang, Hohai University, China
Tuesday, July 5, 2016 (continued)

12:50 – 14:45

**Poster session with light lunch**

1. **Gas hydrate inhibition and its unique thermodynamic behaviors within the Porous clay sediment**
   Yun-Ho Ahn, KAIST, South Korea

2. **Boiling heat transfer enhancement by nano-particles-assembled bi-porous layers**
   Kazuhisa Yuki, Tokyo University of Science-Yamaguchi, Japan

3. **Experiments of water’s effect on mechanical properties of shale rocks**
   Fuquan Song, Zhejiang Ocean University, China

4. **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

13:30 – 19:30

**ad hoc sessions / free time**

19:30

**Dinner on your own**
**Wednesday, July 6, 2016**

07:00 – 09:00 Breakfast

**Oral Session 6: Bio transport in porous media**
Chair: Kun Yang, School of Energy and Power Engineering, Huazhong University of Science and Technology, China

09:00 – 09:25 Effective transport properties of drug delivery systems: Porous granules and tablets
Frantisek Stepanek, University of Chemistry and Technology, Prague, Czech Republic

09:25 – 09:50 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

09:50 – 10:15 An innovative culture technique for microalgae using hollow fiber membranes
Yoshihiko Sano, Shizuoka University, Japan

10:15 – 10:40 Effect of Newtonian heating on bioconvection of nanofluid over stretching sheet with gyrotactic microorganisms
Aminreza Noghrehabadi, Shohadaye Hoveizeh University of Technology, Iran

10:40 - 11:10 Coffee break

**Oral Session 7: Advances in numerical techniques**
Chair: P.A. Dinesh, Ramaiah Institute of Technology, India

11:10 – 11:35 Direct numerical simulation of reactive flow through a fixed bed of catalyst particles
Abdelkader Hammouti, IFP Energies Nouvelles, France

11:35 – 12:00 Numerical investigation of the phase change in transpiration cooling with the VOF method
Xiao-Long Ouyang, Tsinghua University, China

12:00 – 12:25 A mini-review on the Fractal-Monte Carlo method and its applications in porous media
Boming Yu, Huazhong University of Science and Technology, China

12:25 – 19:00 Lunch on your own / ad hoc sessions/ free time

19:00 - 21:30 Reception and Conference Banquet
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<td>Breakfast</td>
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<td>Technical Discussions</td>
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<td>11:00 - 19:30</td>
<td>Excursion / lunch – Both on your own</td>
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<td>19:30 - 21:30</td>
<td>Dinner</td>
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<td>21:30 - 22:30</td>
<td>Technical discussion and social hour</td>
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Friday, July 8, 2016

08:00 - 09:00 Breakfast on your own

Departures