Program

5th International Conference on
Porous Media and Their Applications in Science, Engineering and Industry

An ECI Conference Series

June 22-27, 2014
Kona, Hawaii, USA

Chair

Kambiz Vafai
University of California, Riverside, CA USA

Co-Chairs

Adrian Bejan

Duke University, Durham, NC USA

Akira Nakayama

Shizuoka University, Japan

Oronzio Manca

Seconde Universita degli Studi Napoli, Italy

Engineering Conferences International
32 Broadway, Suite 314
New York, NY 10004, USA
Phone: 1 - 212 - 514 - 6760, Fax: 1 - 212 - 514 - 6030
www.engconfintl.org – info@engconfintl.org

Sheraton Kona Resort & Spa at Keauhou Bay
78-128 Ehukai St
Kailua-Kona, HI 96740
Tel: +1-808-930-4900

Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

Endorsed by

Sunday, June 22, 2014

17:00 – 19:00	Conference Check-in
18:00 – 19:00	Reception
19:00 – 20:30	Dinner
20:30 – 21:30	**Opening Keynote Talk - Challenges and prospects of hydrocarbons recovery from the worldwide shale oil, condensate, and gas reserves: Key issues, proper modeling, critical advancements, and impact of fracking technology** Faruk Civan, University of Oklahoma, USA

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, June 23, 2014

07:00 – 08:00	Breakfast
08:00 – 08:50	**Keynote – Nonlinear natural convection in porous media and the collapse of the wave function** Peter Vadasz, Northern Arizona University, USA
	ORAL SESSION 1: Natural and forced convection in porous media (I) Session Chair: **Faruk Civan**
08:50 – 09:15	**The multi-commodity heat hump dryer** Lorcelie B. Taclan, Adventist University of the Philippines, Philippines
09:15 – 09:40	**Sensitivity analysis of effective thermal conductivity of open-cell ceramic foams using a simplified model based on detailed structure** Miguel Mendes, TU Bergakademie Freiberg, Germany
09:40 – 10:05	**Thermal properties of highly porous fibrous ceramics** Jingjing Sun, Aerospace Research Institute of Materials and Processing Technology, Beijing, China
10:05 – 10:30	**Droplet impact and penetration on series of parallel tubes** Nasser Ashgriz, University of Toronto, Canada
10:30 – 11:00	Coffee Break
	ORAL SESSION 2: Material processing applications Session Chair: **Peixue Jiang**
11:00 – 11:25	**Fabrication and microstructural characterization of silica aerogel by aging additional pressurization** Xiaoyan Wang, Aerospace Research Institute of Material and Processing Technology, Beijing, China
11:25 – 11:50	**The preparation and properties of novel structural carbon foams derived from different mesophase pitches** Liqiong Yu, Aerospace Research Institute of Materials and Processing Technology, Beijing, China
11:50 – 12:15	**Effect of helium-3 formation on the thermal decomposition of uranium tritide particle beds** Ryan Keedy, Sandia National Laboratories, USA
12:15 – 12:40	**On the influences of the thermal boundary condition at porous-fluid interface upon the Nusselt number in a pipe partially filled by a porous material** Nader Karimi, University of Glasgow, Scotland
12:40 – 14:10	Lunch

Monday, June 23, 2014 (continued)

ORAL SESSION 3: Industrial and environmental heat transfer and flow in porous media (I)
Session Chair: **Peter Vadasz**

14:10 – 14:35	**An investigation of porous inserts in electronic coolings** Fatemeh Tavakkoli, University of California, Riverside, USA
14:35 – 15:00	**Improved permeability prediction for heterogeneous porous media by bundle-of-leaky-tubes with cross-flow model** Faruk Civan, The University of Oklahoma, USA
15:00 – 15:25	**Fate and transport of nanohybrids in subsurface media for oil field applications** Ben Shiau, The University of Oklahoma, USA
15:25 – 15:50	**Porous structures used as flameproof pressure relief elements a novel approach of flameless venting** Julia Hornig, Physikalisch-Technische Bundesanstalt (PTB), Germany
15:50 – 16:15	**Effective solid-to-fluid heat transfer coefficient in EGS reservoirs** Xiao-Long Ouyang, Tsinghua University, China
16:15– 16:40	**Particles migrating and plugging mechanism in loosen sandstone heavy oil reservoir and the strategy of production with moderate sanding** Yiting Xie, State Key Laboratory of Oil and Gas Reservoir Geology and Exploitation, China
16:40 – 19:30	*ad hoc* sessions / free time
19:30 – 21:00	Dinner
21:00 – 22:30	Poster Session (with beer and wine)

Tuesday, June 24, 2014

07:00 – 08:00	Breakfast
08:00 – 08:50	**Keynote Talk – Improvements on the local thermal non-equilibrium model in porous media** Pei-Xue Jiang, Tsinghua University, China
	ORAL SESSION 4: Natural and forced convection in porous media (II) Session Chair: **Kevin Anderson**
08:50 – 09:15	**Mixed convection in horizontal channels heated below with external heat losses on upper plate and partially filled with aluminum foam** Oronzio Manca, Dipartimento di Ingegneria Industriale e dell'Informazione, Seconda Università degli Studi di Napoli, Italy
09:15 – 09:40	**Mixed convection in a channel with an open cavity filled with porous media in local thermal non-equilibrium** Oronzio Manca, Dipartimento di Ingegneria Industriale e dell'Informazione, Seconda Università degli Studi di Napoli, Italy
9:40 – 10:05	**On the velocity distribution in a microscopic porous medium** Maciej Matyka, University of Wrocław, Poland
10:05 – 10:35	Coffee Break
10:35 – 11:00	**Miscible density driven convective mass transfer process analysis based on Entransy dissipation theory** Rui-Na Xu, Tsinghua University, China
	ORAL SESSION 5: Experimental and measuring techniques Session Chair: **Robin Gerlach**
11:00 – 11:25	**Experimental analysis of air vortex Impingement through porous screens** Fatemeh Hassanipour, University of Texas at Dallas, USA
11:25 – 11:50	**Experimental evaluation of wellbore cement- formation shear bond strength in presence of drilling fluid contamination** Mileva Radonjic, Louisiana State University, USA
11:50 – 12:15	**Effect of temperature dependent viscosity on natural convective boundary layer flow over a horizontal plate embedded in a nanofluid saturated porous medium** Shobha Bagai, University of Delhi, India
12:15 – 12:40	**Thermohydraulics of Porous Heat Exchangers: Full or Partial Blockage?** Kamel Hooman, University of Queensland, Australia
12:40 – 13:05	**Quantification of effect of convergence in porous media flow** Srinivas Pasupuleti, Indian School of Mines, India
13:05 – 14:35	Lunch

Tuesday, June 24, 2014 (continued)

ORAL SESSION 6: Bio transport in porous media
Session Chair: **Kamel Hooman**

14:35 – 15:00	**Pore scale modeling of the microbially induced CACO3 precipitation process** Robin Gerlach, Montana State University, USA
15:00 – 15:25	**Concentration of bioethanol and dehydration of organic solvents by porous membranes** Tadashi Uragami, Kansai University, Japan
15:25 – 15:50	**A model for magnetic drug targeting in a permeable microvessel with spherical porous carrier particles** Precious Sibanda, University of KwaZulu-Natal, South Africa
15:50 – 16:15	**Multilayer minichannel heat sinks: The effect of porosity scaling on pressure drop** Fatemeh Hassanipour, University of Texas at Dallas, USA
16:15 – 16:40	**Numerical simulation of pressure pulse decay experiment on crushed low permeability rocks considering Klinkenberg effect and gas absorption/desorption** Bo Zhou, Tsinghua University, China
16:40 – 17:05	**Fluid flows through unsaturated porous media: An alternative simulation procedure** Maria Martins-Costa, Universidade Federal Fluminense, Brazil
17:05 – 17:30	**Experimental study of water retention properties of a high performance concrete with small sliced samples** Qier Wu, Université Lille Nord de France, France
17:30– 19:30	*ad hoc* sessions / free time
19:30 – 21:00	Dinner
21:00 – 22:30	Poster session and social hour

Wednesday, June 25, 2014

07:00 – 08:00	Breakfast
08:00 – 08:50	**Keynote Talk – Biofilm-mediated mineral precipitation technology – from the microscale to the field-scale** Robin Gerlach, Montana State University, USA
	ORAL SESSION 7: Combined heat and mass transfer in porous media (I) Session Chair: **Fatemeh Hassanipour**
08:50 – 09:15	**Theoretical investigation of the influences of thermal boundary conditions upon the heat transfer characteristics in a channel partially filled by a porous material** Nader Karimi, University of Glasgow, Scotland
09:15 – 09:40	**HYDRA: Macroscopic modeling of hybrid ablative thermal protection system** Gregory Pinaud, Airbus Defense and Space, France
09:40 – 10:05	**Phase change with local thermal non-equilibrium in a two-phase mixture model** Franz Lindner, Universität der Bundeswehr München, Germany
10:05 – 10:35	Coffee Break
10:35 – 11:00	**Effect of variable porosity on composite heat transfer in a boundary layer flow** Puttabasavsetty Nagaraju, Vijaya College, India
11:00 – 11:25	**The use of expandable casing technology as a new remediation tool for micro-annular gas migration** Mileva Radonjic, Louisiana State University, USA
	ORAL SESSION 8: Particle transport and deformable porous bodies Session Chair: **Mileva Radonjic**
11:25– 11:50	**Studies on permeability properties and particle capture efficiencies of porous SiC ceramics processed by oxide bonding technique** Atanu Dey, Central Glass & Ceramic Research Institute, India
11:50 – 12:15	**MRI evidence of nanoparticles migration in drying porous media** Emmanuel Keita, Université Paris-Est, Laboratoire Navier, France
12:15 – 12:40	**Fractional diffusion model for transport through porous media** Nadeem Malik, King Fahd University of Petroleum and Minerals, Saudi Arabia
12:40 – 14:10	Lunch

Wednesday, June 25, 2014 (continued)

ORAL SESSION 9: Advances in numerical techniques (I)
Session Chair: **Akira Nakayama**

14:10 – 14:35	**Performance comparison of the finite-difference, practical-finite-analytic, differential-quadrature, and differential-cubature methods for solving porous media immiscible fluids transport** Faruk Civan, University of Oklahoma, USA
14:35 – 15:00	**Effects of non-Darcy flow and pore proximity on gas condensate production from nanopore unconventional resources** Jeffrey Callard, University of Oklahoma, USA
15:00 – 15:25	**Transport in groundwater aquifers: Simplifying models using natural stratigraphy** Robert McKibbin, Massey University, New Zealand
15:25 – 15:50	**Modeling and analysis of transport in the resting mammary glands** Ana Quezada, University of California, Riverside, USA
15:50 – 16:15	**CO_2 migration in the geological formation** Shujuan Wang, University of California, Riverside, USA
16:15 – 19:30	*ad hoc* sessions / free time
19:30	Dinner on own

Thursday June 26, 2014

07:00 – 08:00	Breakfast
08:00 – 08:50	**Keynote Talk – Novel convective heat transfer enhancement in channels and tubes filled with nanofluid-saturated metal foams** Akira Nakayama, Shizuoka University, Japan
	ORAL SESSION 10: Combined heat and mass transfer in porous media (Ⅱ) Session Chair: **Shirley Abelman**
08:50 – 09:15	**Three dimensional heat and mass transfer in capillary evaporator** Laetitia Mottet, Institut de Mécanique des Fluides de Toulouse, France
09:15 – 09:40	**Influence of thermal radiation from solid phase upon the local thermal non-equilibrium condition in a porous medium** Nader Karimi, University of Glasgow, Scotland
09:40 – 10:05	**Heat flow from a buried cylindrical tank partially submerged in groundwater** Robert McKibbin, Massey University, New Zealand
10:05 – 10:35	Coffee Break
10:35 – 11:00	**Investigation of transpiration cooling with local thermal non-equilibrium model: Effects of different thermal boundary conditions at the porous-fluid interface** Zheng Huang, Tsinghua University, China
	ORAL SESSION 11: Advanced mathematical approaches to the modeling of porous media Session Chair: **Nasser Ashgriz**
11:00 – 11:25	**Effective permeability upscaling from heterogenous to homogenous porous media** Mehmet Cicek, University of Oklahoma, USA
11:25 – 11:50	**Research of particles migrating mechanism in loosen sandstone reservoir and the strategy of moderate sanding** Zhaohui Chen, SWPU
11:50 – 12:15	**Pressure transient characteristics of multi-stage fractured horizontal wells in shale gas reservoirs with consideration of multiple mechanisms** Jingjing Guo, Southwest Petroleum University, China
12:15 – 13:45	Lunch

Thursday, June 26, 2014 (continued)

ORAL SESSION 12: Advances in numerical techniques (Ⅱ)
Session Chair: **Robert McKibbin**

14:10 – 14:35	**Modified Rhie-Chow / PISO algorithm for collocated variable finite porous media flow solvers** Markus Nordlund, Philip Morris Products SA, Switzerland
14:35 – 15:00	**Turbulence in porous media: Some fundamental questions addressed by DNS solutions** Marc-Florian Uth, Hamburg University of Technology, Germany
15:00 – 15:25	**Wall thickness optimization of a transpiration-cooled sharp leading edge at atmospheric re-entry** Christian Dittert, German Aerospace Center, Germany
15:25 – 15:50	**Numerical solutions of non-linear fractional transport models in unconventional hydrocarbon reservoirs using variational iteration method** Nadeem Malik, King Fahd University of Petroleum and Minerals, Saudi Arabia
15:50 – 16:15	**Comparison of volume-average simulation and pore-scale simulation of thermal radiation and natural convection in high temperature packed beds** Rui-Na Xu, Tsinghua University, China
16:15 – 16:40	**Onset of double diffusive reaction-convection in an anisotropic porous layer with internal heat source** Sravan Nayeka Gaikwad, Gulbarga University, India
16:40– 19:30	*ad hoc* sessions / free time
19:30 – 21:30	Banquet

Friday June 27, 2014

07:00 – 08:00	Breakfast
08:00 – 08:50	**Keynote Talk –From Unsaturated to Saturated Flows through Porous Media via Mixtures Theory** M.L. MARTINS-COSTA , Univerdidade Federal Fluminense
	ORAL SESSION 13: Industrial and environmental heat transfer and flow in porous media (Ⅱ) Session Chair: **Oronzio Manca**
08:50 – 09:15	**Use of liquid pressure-pulse decay permeameter in experimental evaluation of permeability in wellbore cement under geopressured geothermal conditions** Mileva Radonjic, Louisiana State University, USA
09:15 – 09:40	**Numerical Solution of Burgers' equation arising in Longitudinal Dispersion Phenomena in Fluid Flow through Porous Media by Crank-Nicolson Scheme** Ravindara Borana, Bhavan's R.A. College of Science, India
09:40 – 10:05	**Evaporation from a capillary tube: Experiment and modelization** Emmanuel Keita, Université Paris-Est,Laboratoire Navier, China
	Coffee Break
10:35 – 11:00	**Steady MHD flow of a Sisko fluid past a porous plate** Shirley Abelman, University of the Witwatersrand, Johannesburg. South Africa
11:00 – 11:25	**Experimental study for air cooling using membrane covered tray** Mohamed Ali, King Saud University, Saudi Arabia
11:25 – 12:00	Closing Remarks
12:00 – 13:30	Lunch
13:30	Departures

Poster List

#	Presenters	Title
1	Kajal Patel	An approximate solution of Fokker-Planck equation for one-dimensional groundwater recharge through porous media
2	Sonia Woudberg	Comparative analysis of geometric models for predicting the dynamic specific surface of foamlike media
3	Jianjun Liu	A new method based on the technology of micro-scanning imaging to evaluate the permeation parameters of the core
4	Jianjun Liu	Numerical analysis of injecting water inflowing into interlayer caused by damage of interlayer for B82 block of Daqing oil field
5	Kevin Anderson	Numerical simulation of 3-D free convection in porous media due to combined surface forced convection and internal heat generation
6	Kevin Anderson	Numerical study of forced air cooling of a heated porous foam pyramid array
7	Jianjun Liu	Improving the predictions of petrophysical transport behavior using three dimensional finite volume element model with micro-CT images
8	Kazuhisa Yuki	Application of nanoparticles-assembled bi-porous structures to power electronics cooling
9	Kazuhisa Yuki	Three-dimensional flow in a sphere-packed pipe by digital-holographic-ptv and numerical simulation
10	Tibor Müllner	Large-volume reconstruction of porous polymers for the simultaneous analysis of micron and submicron morphological features
11	Kristof Hormann	Reconstruction and morphological analysis of macroporous silica materials using confocal laser scanning microscopy
12	Kristof Hormann	From macropores to mesopores: Three-dimensional morphology of hierarchical porous solids
13	Anna Jansson	Visualizing water transport through polymer films in the ESEM
14	Charlotte Hamngren Blomqvist	Quantitative 3D nanoscale imaging for correlation between porous nanostructure and mass transport properties
15	Hae-Won Cheong	Preparation and characterization of impregnated lithium in porous metal foam on the performance of a thermal battery
16	Jung min Lee	High porosity metal foam cathode impregnated with liquid sulfur