

**Session 1 from 9:30 AM – 11:30 AM**

Room	Session
Stewart 214A	<b>CO2 Sequestration: experimentation, multi-scale modeling and simulation I</b> <i>Session Chair: Mohammad Piri</i> <i>Xinqian &amp; Zuleima</i> , Experimental Investigation of Carbon Dioxide Trapping due to Capillary Retention in Saline Aquifers <i>Saraji, Goual &amp; Piri</i> , Interfacial Tension and Dynamic Contact Angle for sc-CO2/Water/Mineral systems relevant to geological storage of CO2 <i>Alizadeh, Ioannidis &amp; Piri</i> , Recovery of Waterflood Residual Oil Using CO2- Saturated Brine Injection <i>Zhang, Oostrom, Wietsma &amp; Grate</i> , A Micromodel Study of Supercritical CO2 Imbibition and Drainage
Stewart 214B	<b>Nonlinear and Complex Processes in Porous Media I</b> <i>Session Chairs: Dionissios Hristopulos &amp; Didier Lasseux</i> <i>Noetinger</i> , Coupling between flow and permeability : is it possible to up-scale such flows? <i>Habisreutinger &amp; Lunati</i> , Complex interactions of fluids and granular media <i>Akkutlu &amp; Yortsos</i> , Nonlinear Dynamics of Combustion Front Propagation in Porous Media <i>Hristopulos</i> , Brittle fracture in porous media: ceramics, paper, and earthquakes
Stewart 214C	<b>Numerical modeling for flow in fractured and other heterogeneous porous media I</b> <i>Session Chair: Jean Roberts</i> <i>Berre, Sandve, Tambue &amp; Nordbotten</i> , A MPFA approach for simulation of fluid flow and heat transfer in fractured reservoirs <i>Fumagalli &amp; Scotti</i> , Reduced models for intersecting fractures in porous media with non-matching grids <i>Frih, Jaffre, Martin, Roberts &amp; Saada</i> , Modeling flow in fractured porous media with fractures as interfaces <i>de Dreuzy</i> , Upscaling transport in complex geological domains
Stewart 214D	<b>Mixing and reactive transport in natural and engineered porous media I</b> <i>Session Chairs: Tim Ginn &amp; Dave Benson</i> <i>Fernández-García, Sanchez-Vila &amp; Henri</i> , Modeling multicomponent reactive transport with particle tracking and smoothing techniques <i>Maunul Huber</i> , Pore-scale simulation of incompressible flow in fibrous porous media using Smoothed Particle Hydrodynamics (SPH) <i>Redden, Fox, Guo, Gebrehiwet, Henriksen</i> , Huang, Fujita & Zhang Control of the spatial and temporal distributions of mineral precipitates by the nature of reactant mixing in porous media
Stewart 218A	<b>Biological Porous Media I</b> <i>Session Chair: Dan Tartakovsky</i> <i>Cowin &amp; Cardoso</i> , Mixture theory-based poroelasticity as a model of interstitial tissue growth <i>Haider &amp; Hu</i> , Porous Mixture Models for Cartilage Regeneration in Cell-Seeded Scaffolds <i>Facchini, Bellin &amp; Toro</i> , On modeling transport of solutes across the Blood Brain Barrier
Stewart 218B	<b>Pore Scale Modeling</b>

	<p><b>Session Chair:</b> Maciej Haranczyk</p> <p><i>Arns &amp; Adler</i>, A fast Laplace solver approach to pore scale permeability</p> <p><i>Beyhaghi &amp; Pillai</i>, Experimental and Theoretical Validation of permeability obtained using the closure formulation for sintered polymer wicks</p> <p><i>de Prisco, Grader &amp; Tolke</i>, Computation of relative permeability functions in 3D digital rocks</p> <p><i>Ebigbo, Golfier &amp; Quintard</i>, Pore-scale modelling of biofilm activity in the underground storage of hydrogen</p>
Stewart 218C	<p><b>Pore-scale visualization of processes in porous media I</b></p> <p><b>Session Chairs:</b> Nikolaos Karadimitriou, S. M. Hassanizadeh, Laura Pyrak-Nolte</p> <p><i>Bernard, Combaret &amp; Plougonven</i>, Pore-scale visualization of processes in porous media</p> <p><i>Thovet &amp; Adler</i>, Grain reconstruction of porous media: Application to a Bentheim sandstone</p> <p><i>Crandall, Ahmadi, Ferer, Smith &amp; Bromhal</i>, Multiphase Flow in Fractured Porous Media</p> <p><i>Ma, Jiang, Wu, Tian &amp; Couples</i>, Representing characteristic attributes of pore structures of digital rocks for classification</p>

**Session 2 from 2:10 PM – 4:10 PM**

Room	Session
Stewart 214A	<p><b>CO2 Sequestration: experimentation, multi-scale modeling and simulation II</b></p> <p><b>Session Chair:</b> Mohammad Piri</p> <p><i>Akbarabadi &amp; Piri</i>, Relative permeability hysteresis and permanent capillary trapping characteristics of supercritical CO2/brine fluid systems: an experimental study at reservoir conditions</p> <p><i>Akbarabadi, Furtado, Marchesin, Pereira, Piri &amp; Rahunathan</i>, Permeability Hysteresis Effects in Geologic CO2Sequestration</p> <p><i>Marchesin, Rodriguez &amp; Bruining</i>, Vertical flow of supercritical CO2, water and oil in deep reservoirs</p> <p><i>Häberle &amp; Ehlers</i>, Carbon-dioxide storage: regarding phase transition processes and crack development in the cap-rock layer</p>
Stewart 214B	<p><b>Nonlinear and Complex Processes in Porous Media II</b></p> <p><b>Session Chairs:</b> Dionissios Hristopulos &amp; Didier Lasseux</p> <p><i>Hilpert, Glantz, Hsu &amp; Pellichero</i>, Effects of Dynamic Capillary Pressure on Two-phase Flow in Porous Media (withdrawn)</p> <p><i>Di Federico</i>, Analytical solutions and parametric uncertainty of non-Newtonian fluid flow in porous media</p> <p><i>Doster, Joekar-Niasar, Nordbotten &amp; Celia</i>, Trapping in two-phase flow in porous media</p> <p><i>Golfier &amp; Kone</i>, Experimental and numerical investigation of groundwater contaminant transport in the presence of biofilm</p>
Stewart 214C	<p><b>Numerical modeling for flow in fractured and other heterogeneous porous media II</b></p> <p><b>Session Chair:</b> Jean Roberts</p> <p><i>Maier, Schmid &amp; Geiger</i>, General dual-porosity modeling using the exact analytical solution for spontaneous imbibition</p>

	<p><i>Tyagi, Gimmi &amp; Churakov</i>, Multi-Scale Method for Up-Scaling Transport in Hierarchical Porous Media</p> <p><i>Mukhopadhyay &amp; Liu</i>, Transient Transport of Isotopic Tracers in Reactive Fluid-Rock Systems</p> <p><i>Wang &amp; Yao</i>, Pore-scale study of the fracture influence on fluid flow properties in heterogeneous carbonate media</p>
Stewart 214D	<p><b>Mixing and reactive transport in natural and engineered porous media II</b></p> <p>Session Chairs: <a href="#">Tim Ginn &amp; Dave Benson</a></p> <p><i>Bolster, Dentz &amp; Le Borgne</i>, Hyper-Mixing in Pure Shear Flows</p> <p><i>Benson, Ding, Paster &amp; Bolster</i>, On the Influence of Dimensions and Boundaries on the Governing Equation of Bimolecular Chemical Reactions</p> <p><i>Engdahl</i>, Multi-scale analysis of reactive transport and mixing measures in porous media</p> <p><i>Willmann, Carrera, Sanchez-Villa &amp; Dentz</i>, Upscaling Reactive Transport using Multi-Rate Mass Transfer</p>
Stewart 218A	<p><b>Biological Porous Media II</b></p> <p>Session Chair: <a href="#">Dan Tartakovsky</a></p> <p><i>Battiato, Intaglietta &amp; Tartakovsky</i>, Effects of Glycocalyx on Attenuation of Shear Stress on Endothelial Cells</p> <p><i>O'Malley &amp; Cushman</i>, Adaptive renormalization of stochastic dynamics with application to data assimilation and numerical modeling</p>
Stewart 218B	<p><b>Pore Scale Modeling</b></p> <p>Session Chair: <a href="#">Maciej Haranczyk</a></p> <p><i>Kumar, Hugo, Topin &amp; Tadriss</i>, Impact of geometrical parameters on thermo-hydraulic properties of casted open cell metal foam</p> <p><i>First, Gounaris, Wei &amp; Floudas</i>, Three-dimensional Characterization of Microporous Networks</p> <p><i>Haranczyk &amp; Martin</i>, Tools and Approaches for Discovery of Carbon Capture Materials</p> <p><i>Rahmani, Prodanovi, Bryant &amp; Huh</i>, Quasi-static analysis of a ferrofluid blob in a capillary tube</p>
Stewart 218C	<p><b>Pore-scale visualization of processes in porous media II</b></p> <p>Session Chairs: <a href="#">Nikolaos Karadimitriou</a>, <a href="#">S. M. Hassanizadeh</a>, <a href="#">Laura Pyrak-Nolte</a></p> <p><i>Chmielewski, Dufresne, Maltbie &amp; Westrick</i>, 3d Multimodality Imaging for Visualization of Fluid Flow in Consumer Products</p> <p><i>Werth, Boyd, Valocchi, Zhang, Hess, Oostrom &amp; Yoon</i>, Precipitation of carbonate minerals along a transverse mixing zone in a microfluidic pore network</p> <p><i>Timp, Nelson, Kurz &amp; Timp</i>, The Prospects for a Single Cell Secretome: Using a Nanopore for Both Analyte Detection and Cell Transfection</p>
Stewart 218D	<p><b>Thin Porous Media</b></p> <p>Session Chairs: <a href="#">Ken Comer</a></p> <p><i>Schunk &amp; Roberts</i>, Coupled Thin-Film Reynolds Equation and Poroelastic Media: Theoretical and Computational Approach using Finite Element Shells</p> <p><i>Bucher, Emami &amp; Tafreshi</i>, Modeling Superhydrophobic Surfaces Comprised of Randomly Deposited Fibers or Particles</p> <p><i>Tafreshi &amp; Bucher</i>, Modeling Transport Phenomena in Anisotropic Fibrous Media</p> <p><i>Riasi, Huang, Montemagno &amp; Yeghiazarian</i>, Pore Network Modeling of Drainage in Highly Porous, Nonwoven Fiber Materials</p>

**Session 3 from 4:35 PM – 6:35 PM**

Room	Session
Stewart 214A	<b>CO2 Sequestration: experimentation, multi-scale modeling and simulation III</b> <b>Session Chair:</b> Felipe Pereira <i>Pereira, Furtado &amp; Mendes</i> , Numerical Simulation of the Injection of Carbon Dioxide into Saline Aquifers <i>Talebian, Al-Khoury &amp; Sluys</i> , XFEM-Level set model for CO2 sequestration <i>Ovaysi &amp; Piri</i> , Direct pore-scale modeling of multi-component dispersion and ion transport in natural porous media <i>Botan, Rotenberg, Marry, Turq &amp; Noetinger</i> , Carbon dioxide in clay hydrates from classical molecular simulations
Stewart 214B	<b>Nonlinear and Complex Processes in Porous Media III</b> <b>Session Chairs:</b> Dionissios Hristopulos & Didier Lasseux <i>Axelsson</i> , A reformulation of the time-dependent Navier-Stokes equation for variable density and the numerical solution of coupled fluid flow porous media problems <i>Savatorova, Talonov, Vlasov &amp; Volkov-Bogorodsky</i> , Upscaling of Filtration in Rigid Porous Media: Investigation of Effective Permeability of Periodic Granular Medium <i>Correa &amp; Borges</i> , Computational Model for Buoyancy-Driven Flow Within Highly Heterogeneous Porous Media <i>Petrakis &amp; Hristopulos</i> , Statistics of burst avalanches in fiber bundle models and connections with earthquake dynamics
Stewart 214C	<b>Numerical modeling for flow in fractured and other heterogeneous porous media III</b> <b>Session Chair:</b> Jean Roberts <i>Thovert, Mourzenko &amp; Adler</i> , Permeability of isotropic and anisotropic fracture networks, from the percolation threshold to very large densities <i>Petrovitch, Pyrak-Nolte &amp; Nolte</i> , Hydromechanical Scaling of Field and Laboratory Single Fractures
Stewart 214D	<b>Mixing and reactive transport in natural and engineered porous media III</b> <b>Session Chairs:</b> Tim Ginn & Dave Benson <i>Neupauer &amp; Mays</i> , Chaotic Advection, Spreading, and Contaminant Degradation Reactions in Porous Media <i>Trefry, Metcalfe, Lester, Regenauer-Lieb, Hackl &amp; Yap</i> , Engineering scalar transport in porous media via chaotic advection <i>Oostrom, Zhang, Wietsma &amp; Hess</i> , Development of experimental pore-scale transverse mixing data sets for testing and verification of numerical models <i>Sanchez-Vila, Barahona-Palomo &amp; Fernandez-Garcia</i> , Facies reconstruction through the exploitation of a locally adaptive kernel regression: implications in risk evaluations
Stewart 218A	<b>Modeling Complexity: Targeted Tissue Drug Delivery</b>

	<p><b>Session Chairs:</b> Richard Magin &amp; Bies</p> <p><i>Dokoumetzidis &amp; Macheras</i>, The Changing Face of the Rate Concept in Biopharmaceutical Sciences: From Classical to Fractal and Finally to Fractional</p> <p><i>Wojciechowski</i>, Numerical Solution of a Nonlinear Volterra Partial Differential Equation Modeling a Controlled-Release Drug Delivery Device</p> <p><i>Wagner &amp; Ehlers</i>, Modelling of Drug Delivery via Infusion into Multiphasic Brain Tissue</p> <p><i>Wittum</i>, Penetration of Xenobiotics through Human Skin (<i>withdrawn</i>)</p>
Stewart 218B	<p><b>Pore Scale Modeling</b></p> <p><b>Session Chair:</b> Maciej Haranczyk</p> <p><i>Sun, Mueller, Metzger &amp; Tsotsas</i>, Investigation of lotion distribution in wet wipes by pore network model and X-ray micro tomography</p> <p><i>Tartakovsky, Kordilla &amp; Geyer</i>, SPH Model For Droplet Flow in a Fracture</p> <p><i>Yiotis, Salin, Tajer &amp; Yortsos</i>, Analytical solutions and Pore Network modeling of isothermal drying in porous media based on experimental studies</p> <p><i>Shaeri, Beyhaghi &amp; Pillai</i>, A Modified Hoshen-Kopelman Method for Cluster Labeling in Drying of Pore-Network Models</p>
Stewart 218C	<p><b>Pore-scale visualization of processes in porous media III</b></p> <p><b>Session Chairs:</b> Nikolaos Karadimitriou, S. M. Hassanizadeh, Laura Pyrak-Nolte</p> <p><i>Sheppard, Latham, Myers, Kingston, Varslot, Knackstedt, Wildenschild &amp; Andersson</i>, Imaging of in-situ and ex-situ drainage and imbibition experiments</p> <p><i>Karadimitriou, Hassanizadeh &amp; Kleingeld</i>, Two-phase flow experiments with PDMS micro-models; the quasi-static case</p> <p><i>Armstrong, Porter &amp; Wildenschild</i>, Measuring fluid-fluid interfacial curvatures using x-ray microtomography</p> <p><i>Sedighi-Gilani</i>, Neutron imaging of hygroscopic moisture transport in wood exposed to high temperature</p>
Stewart 218D	<p><b>Multiscale Non-Darcy Flow</b></p> <p><b>Session Chair:</b> Yucel Akkutlu</p> <p><i>Valdés-Parada, Aguilar-Madera, Goyeau &amp; Ochoa-Tapia</i>, Jump conditions and location of the dividing surface for Momentum transport between a fluid and a porous media</p> <p><i>Huang &amp; Yao</i>, Coupling Two-Phase Free Flow with Porous Flow: Theoretical Development for The Fluid-Porous Interface Conditions and Numerical Analysis</p> <p><i>Dukhan &amp; Musa</i>, Pressure Drop for Airflow through Disks of 20-ppi Metal Foam</p> <p><i>Akkutlu</i>, Multi-scale Discussions on Gas Storage and Transport in Organic-rich Shale</p>