3rd Br InterPore Conference on Porous Media:

PRELIMINARY PROGRAM

- 08:00-08:30 - **REGISTRATION AND COFFEE**
- 08:30-08:50 - **OPENING CEREMONY 3rd InterPore**

Plenary Lecture 1

Chair: Marcio Murad (LNCC)

- 08:50-9:50 – PL01 - **Michel Quintard** (IMFT). Dissolution of porous media and cavities: a multi-scale view.

Semi-Plenary Plenary Lectures 1, 2, 3 & 4

Poromechanics

Chair: Eduardo Gildin (Texas A&M University)

- 9:50-10:20 - SP 01 – **Marcelo Sánchez** (Texas A&M University). Enhanced Geothermal Systems: Challenges and Opportunities.
- 10:20-10:50 - SP 02 – **Fernando Duda** (COPPE). Large deformation and fluid permeation in polymer gels.
- 10:50-11:20 - SP 03 – **Leonardo Guimarães** (UFPE). Coupled Thermal-Hydro-Mechanical Modeling of Rocks Subjected to Dissolution and Precipitation of Minerals.
- 11:20-11:50-. SP 04 - **Roberto Quevedo** (TECGRAF). A Review of Alternative Hydro-Mechanical Coupling Strategies.

- 11:50-12:10 - **Coffee break**

Contributed Talks

Enhanced Oil Recovery Models

Chair: Adolfo Puime (UENF)

Auditorium A

- 12:10-12:30 - CT 01 – **Thiago Quinelato** (UFJF). Discretization of a model for two-phase flow with foam injection in porous media.
- 12:30-12:50 - CT 02 – **Viviane Klein** (UFRN). Computational Modeling for Polymer Injection: Application to Loss of Injectivity.
- 12.50-13:10 - CT 03 – **Felipe Apolinario** (UENF). Mathematical Modeling of Oil Displacement by Water Slugs Containing Two Dissolved Chemicals.

Contributed Talks

Pore-Scale Models

Chair: Ranena Ponce (PUC)

Auditorium B

- 12:10-12:30 - CT 04 – **Sidarta Lima** (UFRN). A New Multiscale Computational Model for Low Salinity Waterflooding in Clay Bearing Sandstones.
- 12:30-12:50 – CT 05 – **Paula Pitombeira Reis** (PUC). Capillary Network Model of Retrograde Gas Flow in Porous Media.
- 12:50-13:10 - CT 06 – **Ronaldo Giro** (IBM). Bridging the gap between microscopic and macroscopic fluid dynamics with molecular kinetic theory.

- 13:10-14:30 – **Lunch**

Plenary Lecture 2

Chair: Marcelo Sánchez (Texas A&M University)

- 14:30- 15:30 – PL02 - **Eduardo Gildin** (Texas A&M University). A Review and Some New Results on Reduced-Order Modeling for Coupled Flow and Geomechanics.

Semi-Plenary Lectures 5, 6 & 7

Multiphase Flows

Chair: Eduardo Abreu (UNICAMP)

- 15:30-16:00 - SP 05 – **Grigori Chapiro** (UFJF).   Combustion waves in porous media
- 16:00-16:30 - SP 06 – **Adolfo Puime** (UENF). Mathematical Modeling of Injectivity Tests for Enhanced Oil Recovery.
- 16:30-17:00 - SP 07 – **Hans Bruining** (Delft University). Constitutive relations for primary, secondary drainage and imbibition from percolation theory.

- 17:00-17:20 - **Coffee break**

Contributed Talks

Porous Media Flow and Conservation Laws

Chair: Eduardo Abreu (UNICAMP)

Auditorium A

- 17:20-17:40 - CT 07 – **Luara Souza** (UENF). Mathematical Modeling of Pressure Behavior in Two-phase Three-component Flows in Porous Media. states.

- 17:40-18:00 - CT 08 – **Amaury Alvarez** (UFRJ). Numerical solution of Partial Differential-Algebraic Equations (PDAEs) in Geochemical Modeling
- 18:00-18:20 - CT 09 – **Luis Fernando Lozano** (UFJF). Riemann problem solution for simple model describing foam flow in porous media
- 18:20-18:40 - CT 10 – **Arthur Santo** (UNICAMP). Numerical properties of the weak asymptotic method applied to the Lagrangian-Eulerian framework.
- 18:40-19:00 - CT 11 – **Pablo Castañeda** (ITAM). Three-phase flow for foam-oil displacements with multiple steady states

Contributed Talks

Carbonate Rocks

Chair: Carol Cazarin (Petrobras)

Auditorium B

- 17:20-17:40 - CT 12 – **Frederico Gomes** (PUC). Equivalent permeability of karst porous media using Brinkman's model.
- 17:40-18:00 - CT 13 – **Thomas de Oliveira** (CENPES). Impact of Physical Heterogeneity on Multispecies Reactive Transport in a Microporous Carbonate.
- 18:00-18:20 - CT 14 – **Alexandre Souza** (LASURF). Understanding the geochemical equilibrium between Pre-Salt carbonate analogues and CO_2-saturated brines: a theoretical and experimental study at reservoir conditions.
- 18:20-18:40 - CT 15 – **Aline Rocha** (LNCC). A Coupled 3D-1D Model For Flow In Karst-Carbonates Containing Conduits
- 18:40-19:00 - CT 16 **Paulo Couto** (UFRJ). Modelling flow and transport processes in carbonate rocks using an integrated pore-scale network approach.

Plenary Lecture 3

Chair: Hans Bruining (TU Delft)

- 19:00-20:00 – PL03 - **Dan Marchesin** (IMPA). Injection problems for systems of conservation laws.

- 20:00- 22:45 – **Welcome reception at LNCC hall**
- 22:45 - **Shuttle to Hotels**

Plenary Lecture 4

Chair: Eduardo Abreu (UNICAMP)

- 09:00-10:00 – PL04 - **Majid Hassanizadeh** (Utrecht University). Capillarity in porous media at different scales.

Semi-Plenary Lectures 8, 9 & 10

Data Assimilation and Uncertainty Quantification

Chair: Felipe Pereira (UT Dallas)

- 10:00-10:30 - SP 08 – **Alexandre Emerick** (Petrobras). Combining Deep Learning and Ensemble Smoother for Data Assimilation in Models of Geological Facies.
- 10:30-11:00 - SP 09 – **Marcio Borges** (LNCC). Adaptive McMC methods applied to the characterization of rock properties in flow in porous media.
- 11:00-11:30 - SP 10 – **Rafael Moraes** (Petrobras). Mutiscale gradient computation methods applied to subsurface data assimilation.

- 11:30-11:50 - **Coffee break**

Contributed Talks

Reservoir Modeling

Chair: Abelardo Barreto (PUC)

Auditorium A

- 11:50-12:10 - CT 17 – **Renan Vieira Bela** (PUC). Estimating Skin Zone Properties from Injectivity Tests Data.
- 12:10-12:30 - CT 18 – **João Debossam** (UERJ). On the Numerical Simulation of Two-phase Water-Gas Flow in Shale Gas Reservoir Including Slippage Effect.
- 12:30-12:50 - CT 19 – **Juan Diego Heringer** (UERJ). Numerical Simulation of Non-Isothermal Flow in a Heavy Oil Reservoir Including Wellbore-Reservoir Coupling.
- 12:50-13:10 - CT 20 – **Luana Cantagesso** (UENF). Saturation-Pressure relationship for transient multiphase flow in porous media.

Contributed Talks

Advanced Numerical Schemes for Porous Media Flows I

Chair: Sandra Malta (LNCC)

Auditorium B

- 11:50-12:10- CT 21 – **Stevens Paz** (USP). A velocity extrapolation strategy for IMPES in oil reservoir simulations.
- 12:10-12:30 – CT 22 – **Filipe de Paula** (UFJF). High order finite volume method to solve the two-phase flow with foam injection in porous media.
- 12:30-12:50 - CT 23 – **Josué Barroso**(LNCC). Augmented Lagrangian Method for Hydromechanical Coupling in Poroelastic Media with Non-linear Elastic Joints.
- 12:50-13:10 - CT 24 – **Diego Volpatto** (ESSS). Stabilized Dual Hybrid Mixed FEM for miscible displacement in double porosity/permeability porous media.

- 13:10-14:00 – **Lunch**

Plenary Lecture 5

Chair: Rafael Moraes (Petrobras)

- 14:00- 15:00 –PL05 - **Denis Voskov** (TU Delft). Operator-Based Linearization approach for flow and transport with equilibrium and kinetic reactions.

Semi-Plenary Lectures 11,12 & 13

Advanced Numerical Schemes for Porous Media Flows II

Chair: Sandra Malta (LNCC)

- 15:00-15:30 - SP 11 – **Philippe Devloo** (UNICAMP). On the Numerical Simulation of Discrete Fracture Networks.
- 15:30-16:00 - SP 12 – **Igor Mozolevski** (UFSC). Discontinuous Galerkin method for a single phase Darcy flow in fractured porous media.
- 16:00-16:30 - SP 13 – **Maicon Correa** (UNICAMP). A Numerical Study of the Total Compressibility in Three-Phase Immiscible Flow in Poroelastic Media.

- 16:30-17:00 - **Coffee break**

Contributed Talks

Pore-Scale Modeling and Upscaling

Chair: Sidarta Lima (UFRN)

Auditorium A

- 17:00-17:20 - CT 25 – **Monique Dali** (PUC). Flow through a channel with a permeable porous wall using Brinkman's model.
- 17:20-17:40 - CT 26 – **Rafael Ferrao** (PUC). Evaluation of Equivalent Permeability in 3D Vuggy Porous Media using Brinkman Model.
- 17:40-18:00 - CT 27 – **Sergio Ribeiro** (PUC). Analysis of Pore-Scale Flow Changes Associated with Selective Pore Blocking.

Contributed Talks

Experimental Methods

Chair: Ranena Ponce (PUC)

Auditorium B

- 17:00-17:20 - CT 28 – **Bruna Leopércio** (PUC). Designing gellan gum microcapsules for flow mobility control in porous media.
- 17:20-17:40 - CT 29 – **Nicolle Lima** (PUC). Foam Formation During Drainage of Surfactant Solution by Gas Injection.
- 17:40-18:00 - CT 30 – **Thiago Pereira** (PUC). Polymer Flooding in Sandstone: Adsorption and Oil Displacement.
- 18:00-18:20 - CT 31 – **Marcelo Coelho** (PUC). Comparison of the effects of capillary number on gas condensate relative permeability through rocks with different absolute permeabilities.

Plenary Lectures 6 & 7

Microscopic Flow in Fractures

Chair: Michel Quintard (IMFT)

- 18:20-19:20 – PL06 - **Didier Lasseux** (University of Bordeaux). Slightly compressible gas slip flow in a fracture: macroscopic model and simulations.
- 19:20-20:20 – PL07 - **Masa Prodanovic** (UT/Austin). Particulate suspension flow in rough fractures.

- 20:30-21:00 - **Meeting of the Brazilian Chapter of Interpore** (Auditorium B)

Plenary Lecture 8

Chair: Alexandre Madureira (LNCC)

- 09:00-10:00 – PL08 - **Frederic Valentin** (LNCC). Multiscale Hybrid-Mixed Finite Element Methods for Porous Media Flows: An Overview and Recent Results.

Semi-Plenary Lectures 14, 15 & 16

Multiscale Methods I

Chair: Maicon Correa (UNICAMP)

- 10:00-10:30 - SP 14 – **Marcus Sarkis** (WPI). Robust Model Reductions for Darcy Equations with Heterogeneous Permeabilities.
- 10:30-11:00 - SP 15 – **Fabricio Simeoni** (USP). The Multiscale Robin Coupled Method: overview and recent developments,
- 11:00-11:30 - SP 16 – **Alexandre Madureira** (LNCC). Spectral decomposition of finite elements for high contrast problems.

- 11:30-11:50 - **Coffee break**

Contributed Talks

Multiscale Methods II

Chair: Frederic Valentin (LNCC)

Auditorium A

- 11:50-12:10 - CT 32 – **Rafael Guiraldello** (USP). Velocity postprocessing strategies for multiscale mixed methods.
- 12:10-12:30 - CT 33 – **Alfredo Jaramillo** (USP). High Performance Computing of the Multiscale Robin Coupled Method for oil reservoir simulations.
- 12:30-12:50 - CT 34 – **Paola Ferraz** (UNICAMP). Multi-core implementation of a multiscale direct solver for flow in high-contrast formations.

Contributed Talks

Microscopic Imaging of Porous Media I

Chair: Masa Prodanovich (UT/Austin)

Auditorium B

- 11:50-12:10 – CT 35 – **Rodrigo Surmas** (Petrobras). Determination of Porosity and residual oil saturation using microtomography images.
- 12:10-12:30 - CT 36 – **Raphael Chalhub Ribeiro** (PUC). 3D Visualization of oil recovery by injection of a dispersion of soft microcapsule using confocal laser scanning microscopy.
- 12:30-12:50 - CT 37– **Rafael Augusto Alves** (ESSS). Improving efficiency and accuracy of pore network modelling: connecting PNM research with commercial applications.

- 12:50-14:00 - **Lunch**

Plenary Lecture 9

Chair: Grigori Chapiro (UFJF)

- 14:00- 15:00 – PL09 - **Pacelli Zita** (Delft University). Three-Dimensional Simulation of Density-Driven Natural Convection in Porous media for CO2 Geological Storage.

Semi-Plenary Lectures 17, 18 & 19

Waves in Porous Media

Chair: Grigori Chapiro (UFJF)

- 15:00-15:30 - SP 17 – **Alexei Mailybaev** (IMPA). Combustion in miscible displacement for high pressure air injection.
- 15:30-16:00 - SP 18– **André Novotny** (LNCC). Micro-Seismic Faults Reconstruction from Pointwise Wavefield Boundary Measurements.
- 16:00-16:30 – SP 19 – **Vanessa Simões** (Schlumberger). Measurement Integration for Reservoir Characterization.

- 16:30-17:00 - **Coffee break**

Contributed Talks

Stochastic Modelling and Upscaling

Chair: Marcio Borges (LNCC)

Auditorium A

- 17:00-17:20 - CT 38 – **Andrés Valdez** (UFJF). A study of uncertainty quantification and sensitivity analysis of a relative permeability model used to simulate two-phase flow in porous media.
- 17:20-17:40 - CT 39 – **Leandra Inácio de Paula** (UFRJ). Anisotropy Analysis of Hydraulic Conductivity In Soil
- 17:40-18:00 - CT 40 – **Victor Hugo** (UNICAMP). A Thermodynamic Approach for Adsorption in Porous Media.

Contributed Talks

Microscopic Imaging of Porous Media II

Chair: – Rodrigo Surmas (Petrobras)

Auditorium B

- 17:00-17:20 - CT 41 – **Débora do Nascimento** (PUC). Simultaneous visualization and quantification of immiscible displacement in 3D porous media by confocal microscopy.
- 17:20-17:40 – CT 42 – **Guilhermo López** (USP). Features analysis for determining pore network from X-ray microtomography images.
- 17:40-18:00 - CT 43 – **Haimon Alves** (UERJ). A μCT and TD-NMR approach to the probing of negative spaces in a bamboo sample.

Plenary Lecture 10

Chair: Majid Hassanizadeh (Utrecht University)

- 18:00-19:00 –PL10 - **Lilit Yeghiazarian** (University of Cincinnati). Emerging Technologies for Global Water Quality and Sustainability.

- 19:15-20:00 – **Shuttle for Dinner's Place**
- 20:00-23:30 – **Dinner 3rd BR InterPore**

Semi-Plenary Lectures 20, 21, 22 & 23

Complex Porous Media I

Chair: Marcio Carvalho (PUC)

- 09:00-09:30 – SP 20 – **Adriano dos Santos** (UFRN). Polymer retention: the role of particle and pore size distributions.
- 09:30-10:00 – SP 21 – **Wanderson Lambert** (UNIFAL). A two-scale relaxation analysis in two-phase flows with hysteresis: Riemann problem solutions and numerics
- 10:00-10:30 – SP 22 – **Celso Fernandez** (UFSC). Characterization of Multiscale Pore Systems by means of X-ray Tomography.
- 10:30-11:00 - SP 23 – **Giuseppe Romanazzi** (UNICAMP). Superconvergence of a finite difference method for solving parabolic-elliptic PDE systems, application in the numerical simulation of abnormal cell dynamics in the colon epithelium.

Contributed Talks

Petrophysics

Chair: Patricia Pereira (LNCC)

Auditorium A

- 11:00-11:20 - CT 44 – **Monica Costa** (Petrobras). Using computational rock physics to investigate the elastic properties of a sandstone reservoir.
- 11:20-11:40 - CT 45 – **Rodrigo Neumann** (IBM). Cloud-based Digital Petrophysics.
- 11:40-12:00 - CT 46 – **João Paulo Nunes** (Petrobras). A comparative study of elastic, single- and two-phase REV of porous rocks.

Contributed Talks

Complex Porous Media II

Chair: Giuseppe Romanazzi (UNICAMP)

Auditorium B

- 11:00-11:20 - CT 47 – **Daniel Alfaro** (UFRJ). An improved ultra weak variational method for the wave equation using a ray tracing technique.
- 11:20-11:40 - CT 48 – **Karl Igor Martins Guerra** (PUC-Rio). Formulation of a dynamical damping equation for geological porous media

Plenary Lectures 11

Complex Porous Media II

Chair: Marcio Murad (LNCC)

- 12:00-13:00 –PL11 - **Marcio Carvalho** (PUC). Microscale Flow of Complex Liquids through Porous Media.

- 13:00-13:10 – **Closure 3rd BR InterPore**
- 13:10-14:00 – **Lunch**
- 14:00 – **Shuttle to Rio City and Airport**