

TECHNICAL PROGRAMME

Monday 13 June 2022 – Paraninfo, UDC

08:00 Registration

08:20 Opening

08:30 EXPERIMENTAL ROCK PHYSICS (I)

Chair: Rune M. Holt

08:30 - Combined Geophysical and Petrographic Analysis of Carbonate-bearing Synthetic Sandstones Exposed to CO₂ Flow-through

Ismael H. Falcón-Suarez

National Oceanography Centre Southampton, UK

08:50 - Photoporomechanics

Ruben Juanes

Massachusetts Institute of Technology, USA

09:10 - Distribution of Physical Properties in Basalt Hosted Fault Zones

Bob Bamberg

University of Leicester, UK

09:30 - Wettability change in granular porous media impacts wave velocities - Experimental insights

Tobias Müller

China University of Petroleum (East China), China

09:50 Discussion

10:20 Break

10:50 EXPERIMENTAL ROCK PHYSICS (II)

Chair: Per Avseth

10:50 - Laboratory measurements with DAS: Fast and sensitive tool to obtain rock properties at seismic frequencies (online)

Maxim Lebedev

Curtin University, Australia

11:10 - Estimating in-situ static moduli of porous rocks from fibre-optic sensors and pressure-gauge measurements (online)

Boris Guverich

Curtin University, Australia

11:30 - Low-frequency measurements coupled with micro-CT; a new apparatus

Kim Sarah Mews

Norwegian University of Science and Technology (NTNU), Norway

11:50 - Effects of hydrogen on the capillary threshold pressure - First results from a new test device

Eberhard Jahns

Gesteinslabor Dr. Eberhard Jahns, Germany

12:10 Discussion

12:40 Lunch

14:10 EXPERIMENTAL ROCK PHYSICS (III)

Chair: Lucas Pimienta

14:10 - Static and dynamic bulk modulus measurements of dry and saturated pre-salt carbonates

Samuel Chapman

École Normal Supérieure, France

14:30 - Reducing uncertainty in shear wave picking of highly porous chalk

Ermis Proestakis

Technical University of Denmark (DTU), Denmark

14:50 - Dynamic versus static modulus in clays and mudstones in the North Sea

Lars Grande

Norwegian Geotechnical Institute (NGI), Norway

15:10 - Evolution of strain field and microstructure in polycrystalline ice using in situ experiments

Marco A. López Sánchez

Géosciences Montpellier, CNRS, France & Departamento de Geología, Universidad de Oviedo, Spain

15:30 Discussion & wrap-up

16:00 End day 1

16:10 A Coruña City Tour & 19:00 Ice breaker

Tuesday 14 June 2022 – Faculty of Law, UDC

08:30 MODELLING AND MULTISCALE APPLICATIONS (I)

Chair: Ida Lykke Fabricius

08:30 - Pragmatic estimation of full elastic anisotropy for TI shale from C33 only

Rune M. Holt

Norwegian University of Science and Technology (NTNU), Norway

08:50 - Upscaling of shale permeabilities from lab to basin scale 3D pressure modelling using a stochastic approach

Ane Elisabet Lothe

SINTEF Industry, Norway

09:10 - Parameter studies using geomechanical simulations of stress path for overburden of depleting reservoirs

Hong Yan

Norwegian University of Science and Technology (NTNU), Norway

09:30 - Deriving mineral moduli of the non-carbonate fraction in a marly chalk reservoir using petrophysical logging data and the Isoframe model

Leonardo Meireles

Technical University of Denmark (DTU), Denmark

09:50 Discussion

10:20 Break

10:50 MODELLING AND MULTISCALE APPLICATIONS (II)

Chair: Giorgos Papageorgiou

10:50 - Pore boundary deformation and the Biot coefficient: insights from a micromechanical mode

Tobias Müller

CICESE, Mexico

11:10 - Onset and propagation of fractures in deep shale reservoirs: a dynamic approach based in numerical modeling

Saipeng Huang

Northeast Petroleum University, China & Universitat de Barcelona, Spain

11:30 - Strain modeling in a marly chalk reservoir

Ida Lykke Fabricius

Technical University of Denmark (DTU), Denmark

11:50 - Rock physics modeling of increasing stress sensitivity in weakly to moderately cemented sandstone upon stress release

Jiaxin Yu

Norwegian University of Science and Technology (NTNU), Norway

12:10 Discussion

12:40 Lunch

14:10 POSTER SESSION

Chairs: Andrea Muñoz Ibáñez & Ismael H. Falcón Suárez

1: Influence of small axial stresses on the thermal conductivity of sandstones

Salsabyl Benlalam

Université de Pau et des Pays de l'Adour, France

2: Mechanical properties of strong lithologies in the sedimentary sequence of the Cantabrian Zone (N Iberia)

Sergio Llana Fúnez

University of Oviedo, Spain

3: The acoustic properties of carbonate rocks: Effects of stress state and comparison with Sun's extended Biot's theory

Bart A. Verberne

Shell Global Solutions International B.V, The Netherland

4: Proppant-rock interactions under confining conditions: A Hydromechanical experimental assessment

Miguel Herbón Penabad

Universidade da Coruña, Spain

5: Multiscale modeling of rock failure behavior around underground excavations

Shahrbanou Sayadi

Isfahan University of Technology, Iran

6: Discrimination of fluid pressure and saturation changes during geological CO₂ storage based on surface deformation data

Héctor Marín Moreno

Norwegian Geotechnical Institute (NGI), Norway

7: X-ray micro-CT imaging to aid rock physics model development for Enhanced Oil Recovery and CO₂ storage

Héctor Marín Moreno (on behalf of Luke Griffiths)

Norwegian Geotechnical Institute (NGI), Norway

8: Fluid discrimination using rock physics templates in carbonate reservoirs

Javad Sharifi

Ferdowsi University of Mashhad, Iran

15:30 CHALLENGING GASSMANN'S THEORY

Chair: Stephan Gelinsky

15:30 - The Logical Error in Gassmann Poroelasticity: Experimental Data

Leon Thomsen

University of Houston, USA

15:55 - Validation of Gassmann's equations via three-dimensional numerical solutions

Yury Alkhimenkov

University of Lausanne, Switzerland

16:20 Discussion & wrap-up

17:00 End day 2

Wednesday 15 June 2022 – Faculty of Law, UDC

09:00 COUPLED PHENOMENA AND ROCK PROPERTIES (I)

Chair: Héctor Marín Moreno

09:00 - From hydraulic and mechanical properties to hydromechanical coupling in porous rocks: The hidden role of the microstructure

Lucas Pimienta

Université de Pau et des Pays de l'Adour, France

09:20 - How carbonate cement reactions with carbonic acid influence waves speeds in sandstones?

Ludmila Adam

University of Auckland, New Zealand

09:40 - Contact line friction: overlooked mechanism for seismic attenuation and velocity dispersion at partial saturation

Alexander Rozhko

Equinor, Norway

10:00 - The characteristic frequency of squirt flow in porous rocks

Yury Alkhimenkov

University of Lausanne, Switzerland

10:20 Discussion

10:40 Break

11:10 COUPLED PHENOMENA AND ROCK PROPERTIES (II)

Chair: Tobias Müller

11:10 - Digital Rock Physics Applications for Porosity Fractionation and Flow Regime Determination in Carbonate Reservoirs [\(online\)](#)

Ankita Kukshal (on behalf of Ravi Sharma)

Indian Institute of Technology Roorkee, India

11:30 - Impact of noise on fracture compliance estimation from FWS data

Zhenya Zhou

University of Lausanne, Switzerland

11:50 - Influence of temperature on dynamic stiffness properties of high porosity North Sea chalk and the governing mechanism

Tobias Orlander

Technical University of Denmark (DTU), Denmark

12:10 Discussion

12:50 Lunch

15:00 End day 3

15:00 Half-day trip to Santiago de Compostela

Thursday 16 June 2022 – Faculty of Law, UDC

09:00 THE ENERGY TRANSITION CHALLENGE (I)

Chair: Ludmila Adam

09:00 - Experimental investigation of chemo- and bio-mechanical alterations of borehole geomaterials

Audrey Ougier-Simonin

British Geological Survey, UK

09:20 - Gas bubble dynamics during methane hydrate formation and its influence on geophysical properties of sediment using neural network assisted high resolution synchrotron imaging and rock physics modelling

Sourav Sahoo

National Oceanography Centre, Southampton, UK

09:40 - Dispersive rock physics as the key to successful seasonal hydrogen storage

Giorgos Papageorgiou

University of Edinburgh, Norway

10:00 - Vp/Vs sensitivity to rock physical properties and subsurface conditions: A case study from a geothermal-volcanic setting – The Nevado del Ruiz volcano, Colombia

Joaquín Pablo Aguilera Bustos

University of Auckland, New Zealand

10:20 Discussion

10:40 Break

11:10 THE ENERGY TRANSITION CHALLENGE (II)

Chair: Audrey Ougier-Simonin

11:10 - Geothermal inverse modeling using seismic and temperature data

Ran Bachrach

Schlumberger Geosolutions & REMS, USA

11:30 - Laboratory measurement of acoustic velocity and attenuation in partially saturated sand (online)

Hanif S. Sutiyoso

University of Southampton, UK

11:50 - Predicting well-log Thermal Conductivity from sonic velocities: a rock physics investigation

Olivia Collet

Université de Pau et des Pays de l'Adour, France

12:10 - 3D Carbonate Digital Rock Reconstruction Using Machine Learning

Yunyue E. Li
Purdue University, USA

12:30 Discussion

12:50 Lunch

14:10 ROCK PHYSICS TEMPLATES: ADVANCES AND APPLICATIONS

Chair: Arthur Cheng

14:10 - Rock physics modeling of depositional and compactional trends of heterolithic sand-shale mixtures

Per Avseth
Dig Science, Norway

14:30 - Seismic anisotropy in the Iberian Variscan slate belt: Lab determinations in slate samples versus seismic anisotropy from ambient noise interferometry

Sergio Llana Fúnez
University of Oviedo, Spain

14:50 - Wellbore Stability Using Integrated Insitu Stress and Associated Pore Pressure Distribution in Southern Onshore Basin in India ([online](#))

Ankita Kukshal
Indian Institute of Technology Roorkee, India

15:10 Discussion & wrap-up

16:00 End day 4

19:00 Workshop dinner

Friday 17 June 2022 – Faculty of Law, UDC

09:00 ADVANCED ROCK PHYSICS TOOLS

Chair: Ran Bachrach

09:00 - Petrophysical and mechanical properties of shale formations from digital rock analyses and laboratory testing of cutting sized samples

Catherine Ringstad
SINTEF, Norway

09:20 - Constrained Non-linear 4D AVO Inversion Method for Saturation-Pressure Changes Estimation

Nisar Ahmed
University of Stavenger, Norway

09:40 - Rock Physics-Based Approach to Automatic Facies Interpretation (Rock Physics Machine Learning Toolkit)

Marina Pervukhina

CSIRO & Ikon Science Ltd, Australia

10:00 - Solid/fluid substitution: theory versus experiment (online)

Boris Gurevich

Curtin University, Australia

10:20 Discussion

10:40 Break

11:10 Final discussion, awards and venue 7IWRP

12:50 Lunch

14:10 Visit to CITEEC laboratories (limited to 25 participants)