

Building 10, Room B102 (Amphitheater Elias Kyriakides)

Registrations: 07:45-18:00

08:20	Opening ceremony Welcome address by Prof. Panos Papanastasiou (<i>Conference Chair, University of Cyprus</i>) Welcome address by Prof. Marina Neophytou (<i>Dean of the Engineering School, University of Cyprus</i>) Welcome address by Prof. Klaus Regenauer-Lieb (<i>Steering Committee GeoProc</i>)
08:40	Keynote 1. Mechanics of Fluid-Driven Fracture: Recent Results Emmanuel Detournay <i>University of Minnesota, Minneapolis, Minnesota, USA</i> Chair: Euripides Papamichos (<i>University of Thessaloniki, Greece, SINTEF Norway</i>)
Session 1. THMC modelling Chairs: Joseph F Labuz (<i>Univ of Minnesota, USA</i>), Eleni Stavropoulou (<i>EPFL</i>)	
09:20	High-Temperature K-Feldspar Dissolution and Lithium Enrichment in the Cooper Basin: A THMC(E) Perspective Klaus Regenauer-Lieb¹, Yongqiang Chen¹, Manman Hu² ¹ <i>WA School of Mines: Minerals, Energy and Chemical Engineering, Curtin University, Perth 6102, Australia.</i> ² <i>Department of Civil Engineering, The University of Hong Kong, Hong Kong, China</i>
09:40	Deformation Modes of a Porous Limestone: Quantifying the Influence of Initial Porosity Distribution Catherine Doré-Ossipyan^{1,2}, Adriana Quacquarelli¹, Jean Sulem¹, Michel Bornert¹, Alexandre Dimanov² ¹ <i>Laboratoire Navier, École Nationale des Ponts et Chaussées, Institut Polytechnique de Paris, Univ. Gustave Eiffel, CNRS UMR 8205, Marne-la-Vallée, France</i> ² <i>Laboratoire de Mécanique des Solides, École Polytechnique, Institut Polytechnique de Paris, CNRS UMR 7649, Palaiseau, France</i>
10:00	FFT-based solver for computing the thermoporoelastic response of porous composites Maria Camila Olarte¹, Jean-Michel Pereira¹, Patrick Dangla¹ ¹ <i>Navier, ENPC, Institut Polytechnique de Paris, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France</i>
10:20	Coffee Break
10:50	Shear strength recovery of rock salt fractures following healing process Shihao Fu¹, Anne-Catherine Dieudonné¹, David Bruhn¹, Anne Pluymakers¹ ¹ <i>Department of Geoscience and Engineering, TU Delft, The Netherlands</i>
11:10	Chemo-Mechanical Couplings in a Numerical Twin Alexandre Sac-Morane^{1,2}, Hadrien Rattetz¹, Manolis Veveakis² ¹ <i>IMMC, UCLouvain, Louvain-la-Neuve, Belgium</i> ² <i>CEE, Duke University, Durham, NC, USA</i>
11:30	Stress versus damage-induced permeability anisotropy under true triaxial stress states in Etna Basalt Ashley Stanton-Yonge^{1,2}, David Healy², John Browning², Philip Meredith³ and Thomas Mitchell⁴ ¹ <i>University of Padua, Italy</i> ² <i>University College London, UK</i> ³ <i>Universidad Catolica de Chile</i> ⁴ <i>University of Leeds, UK</i>
11:50	Predicting the microstructural evolution of shear bands in crushable granular media Nicholas Anton Collins-Craft¹, Ioannis Stefanou², Jean Sulem¹, Itai Einav³ ¹ <i>Laboratoire Navier, École nationale des ponts et chaussées, Champs-sur-Marne, France</i> ² <i>IMSIA, École nationale supérieure de techniques avancées, Palaiseau, France</i> ³ <i>Particles and Grains Laboratory, University of Sydney, Sydney, Australia</i>
12:10	Spatiotemporal Evolution of Injection-Induced Seismicity in Fractured Rocks Iman Vaezi¹ and Qinghua Lei¹ ¹ <i>Department of Earth Sciences, Uppsala University, Uppsala, Sweden</i>
12:30	Accelerating Earthquake Simulations via Nonsmooth Mechanics and Reduced-Order Modeling David Riley¹ and Ioannis Stefanou¹ <i>IMSIA, CEA, CNRS, EDF, ENSTA Paris, Institut Polytechnique de Paris, Palaiseau, France</i>
12:50	Hysteresis and Strain Memory in Deformable Porous Media under External Stress Satyaki Kundu and Yaniv Edery* <i>Civil and Environmental Engineering, Technion – Israel Institute of Technology, Haifa, Israel</i>
13:10	Lunch
Session 2. CCS Chairs: Roar Egil Flatebø (<i>AkerBP, Norway</i>), Jean-Michel Pereira (<i>Ecole des Ponts Paris Tech</i>)	
14:30	Keynote 2. Artificially intelligent subsurface coupled modelling, an energy industry perspective Vincenzo De Gennaro <i>SLB New Energy Technology - New Energy Industrial Decarbonisation</i>
15:10	Geologic storage of carbon in serpentized ultramafics: advances and setbacks Pouyan Asem¹, Bojan Guzina¹, Joseph Labuz¹, Juerg Matter², John Rudnicki³, Vaughan Voller¹, Emmanuel Detournay¹ ¹ <i>Department of Civil, Environmental, and Geo- Engineering, University of Minnesota, MN 55455, USA</i> ² <i>School of Ocean and Earth Science, University of Southampton, SO14 3ZH,UK</i> ³ <i>Department of Civil and Environmental Engineering, Northwestern University, IL 60208,USA</i>
15:30	Introducing a novel scale for studying geological CO₂ storage Eleni Stavropoulou¹, Dario Sciandra¹, Lyesse Laloui¹ ¹ <i>Ecole Polytechnique Fédérale de Lausanne (EPFL), Laboratory for Soil Mechanics (LMS), EPFL-ENAC-LMS, Station 18, CH-1015 Lausanne, Switzerland</i>
15:50	Hydro-mechanical modelling of swelling in clayey host rocks for subsurface energy applications Michelangelo Cardin¹, Alessio Ferrari^{1,2} ¹ <i>Engineering Department, University of Palermo, Palermo, Italy</i> ² <i>EPFL, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland</i>
16:10	Influence of carbon dioxide on micro-cracking: insights from nanoscale investigation Fanyu Wu¹ and Manman Hu¹ ¹ <i>Department of Civil Engineering, The University of Hong Kong, Hong Kong, Hong Kong SAR</i>
16:30	Coffee Break
17:00	Hydro-Mechanical Coupled Simulation for Assessing Deep Seismic Risk in Geological CO₂ Storage Kenji Furui¹, Aya Katsuta¹, Satomi Kamada¹, Hung Vo Thanh² ¹ <i>Department of Earth Sciences, Resources and Environmental Engineering, Waseda University, Tokyo, Japan</i> ² <i>Waseda Research Institute for Science and Engineering, Waseda University, Tokyo, Japan</i>
17:20	Porosity-elasto-visco-plastic behaviour of claystone for deep radioactive waste disposal Junfeng Ren¹, Philipp Braun¹, Siavash Ghabezloo¹, Carlos Plúa², Minh-Ngoc Vu² ¹ <i>Laboratoire Navier, Champs-sur-Marne, France</i> ² <i>Andra, Châtenay-Malabry, France</i>
17:40	Sustainable exploitation of mafic rock quarry waste for carbon sequestration Ioannis Ioannou¹, Theodora Kyratsi², Ioannis Rigopoulos¹, Loucas Kyriakou¹ ¹ <i>Department of Civil and Environmental Engineering, University of Cyprus, Nicosia, Cyprus</i> ² <i>Department of Mechanical and Manufacturing Engineering, University of Cyprus, Nicosia, Cyprus</i>
18:00	Thermo-Hydro-Mechanical modeling for CCS geomechanical applications: a zero-thickness approach Adrià Pérez¹, José Alvarellos¹, Enric Ibañez¹, José María Segura¹, Daniel Garolera², Lucía Barandiaran² and Ignacio Carol³ ¹ <i>Repsol Technology Lab, Madrid</i> ² <i>DRACSYS, S.L., Barcelona</i> ³ <i>Department of Civil and Environmental Engineering, Technical University of Catalonia, Barcelona, Spain</i>
18:20	End of session – Conference reception (outdoor main entrance Engineering Building)



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Session 3. Geomechanics for Energy and the Environment Chairs: Ignacio Carol (UPC, Barcelona), Catherine Doré-Ossipyan (ENPC-CNRS, France)	
08:30	Keynote 3. Thermo-poro-elastoplastic Rock Response in Enhanced Geothermal Systems Nicolas Espinoza and Matthew McLean <i>Hildebrand Department of Petroleum and Geosystems Engineering, The University of Texas at Austin, Austin, USA</i>
09:10	Rock hydrothermal alteration and fluid composition controls fault frictional healing in the continental crust Rodrigo Gomila¹, Wei Feng¹, Barbara Cantucci², Alessandra Sciarra², Giulio Di Toro^{1,2} ¹ <i>Dipartimento di Geoscienze, Università degli Studi di Padova, Padua, Italy</i> ² <i>Sezione Roma 1, Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy</i>
09:30	Unique Lithium Genesis: Hydro-Mechano-Chemical Pathways in the Cooper Basin Yongqiang Chen¹, Klaus Regenauer-Lieb¹ ¹ <i>WA School of Mines: Minerals, Energy and Chemical Engineering, Curtin University, Perth 6102, Australia.</i>
09:50	Modeling water inflow and temperature variations around a freezing tunnel in fractured rock Jia-Jing Lin¹, Chuanyin Jiang¹, Chin-Fu Tsang^{1,2}, Auli Niemi¹, Patrik Vidstrand³, Qinghua Lei¹ ¹ <i>Department of Earth Sciences, Uppsala University, Uppsala, Sweden</i> ² <i>Lawrence Berkeley National Laboratory, Berkeley, USA</i> ³ <i>Rock Engineering Research Foundation, Stockholm, Sweden</i>
10:10	Coffee Break and Poster session Session 4: Posters
	Water-rock interaction experiments to assess environmental effects in the Geothermal Laboratory in the Crystalline Basement (GeoLaB) Harald Milsch, Fiorenza Deon, Maximilian Dietze, Ulrike Hoffert, Ingo Sass <i>GFZ Helmholtz Centre for Geosciences, Geoenergy, Potsdam, Germany</i>
	Effects of pore fluid properties on Fault Weakening and Thermo-Hydro-Mechanical Processes in the Groningen Gas Reservoir Chien-Cheng Hung¹, André R. Niemeijer¹ ¹ <i>Department of Earth Sciences, Utrecht University, Utrecht, The Netherlands</i>
	An experimental apparatus to investigate fluid-assisted long-term recovery of fractured rocks Michele Fondriest¹, Ismay Vénice Akker¹ ¹ <i>Department of Geosciences, University of Padova, Padova, Italy</i>
	Hydrogen-Induced Alterations in Clay Micromechanics: Assessing Caprock Integrity for Underground Storage P. Cheng¹, T. Mishra², C.P. Zhang³, J.M. Miocic¹ ¹ <i>Energy and Sustainability Research Institute Groningen, University of Groningen, Nijenborgh 6, 9747 AG, Groningen, The Netherlands</i> ² <i>Surface Technology and Tribology, Faculty of Engineering Technology, University of Twente, 7500 AE, Enschede, The Netherlands</i> ³ <i>State Key Laboratory of Coal Mine Disaster Dynamics and Control, School of Resources and Safety Engineering, Chongqing University, Chongqing, 400044, China</i>
	THM Investigation of Frost Heave in Freezing Soils Hoong Hao Yap¹, Federico Lattuada¹, Ferdinando Marinelli², Sebastia Olivella³ ¹ <i>Department of Engineering, University of Cambridge, Cambridge, United Kingdom</i> ² <i>Department of Civil, Architectural and Environmental Engineering, University of Naples Federico II, Naples, Italy</i> ³ <i>Department of Civil and Environmental Engineering, Universitat Politècnica de Catalunya, UPC Campus Nord, Barcelona, Spain</i>
	A mechanical melt localization instability in partially molten rock with a pressure-generating feedback loop Qingpei Sun^{1,2}, Klaus Regenauer-Lieb¹, Manman Hu² ¹ <i>WASM: Minerals, Energy and Chemical Engineering, Curtin University, Perth, Australia</i> ² <i>Department of Civil Engineering, The University of Hong Kong, Hong Kong</i>
11:00	Micromechanical analysis of Fluid injection in unconsolidated formations using the FEM with zero-thickness interfaces Daniel Garolera¹, Charalampos Konstantinou², Ignacio Carol³, Panos Papanastasiou² ¹ <i>DRACSYS, S.L., Barcelona, Spain.</i> ² <i>Department of Civil and Environmental Engineering, U. of Cyprus, Nicosia, Cyprus</i> ³ <i>PHAETHON Centre of Excellence, U. of Cyprus, Nicosia, Cyprus</i> ³ <i>Department of Civil and Environmental Engineering, UPC, Barcelona Spain</i>
11:20	Ground response during short-term borehole thermal energy storage operation Irfan Ahmad Shah¹, Prasenjit Basu¹, Santiram Chatterjee¹ ¹ <i>Dept. of Civil Engineering, Indian Institute of Technology Bombay, Mumbai, India</i>
11:40	Time-dependent constitutive model based on the damage evolution law Hossein Massoumi¹ and Mohammadreza Aghajanzadeh¹ ¹ <i>Department of Civil Engineering, Monash University, Melbourne, Australia</i>
12:00	Investigation of a thermal energy storage sand battery Imad El-Chiti¹, Shadi Najjar¹, Joseph Zeaiter², Salah Sadek¹, Siba Haidar¹, Clara El-Sayegh¹ ¹ <i>Department of Civil and Environmental Engineering, American University of Beirut, Beirut, Lebanon</i> ² <i>Baha and Walid Bassatne Department of Chemical Engineering and Advanced Energy, American University of Beirut, Beirut, Lebanon</i>
12:20	Group Photo
12:30	Lunch
13:30	Excursion to archaeological sites
19:30	Conference Dinner Host: Prof. Euripides Papamichos (Conference Chair, AU Thessaloniki, SINTEF)



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Session 5. Geoenergy exploration, development and production Chairs: Klaus Regenauer-Lieb (Curtin University, Australia), Manman Hu (The University of Hong Kong)	
08:30	Keynote 4. Geomechanics in extreme conditions: how do we model tightly coupled process across the scales? Manolis Veveakis Duke University, USA
09:10	Fracture closure in pure quartz sandstone at low stress and temperature Harald Milsch^{1,2} , Chaojie Cheng ^{1,2} , Renchao Lu ³ , Haibing Shao ³ , Olaf Kolditz ^{3,4} ¹ GFZ Helmholtz Centre for Geosciences, Geoenergy, Potsdam, Germany ² KIT Karlsruhe Institute of Technology, Applied Geosciences, Karlsruhe, Germany ³ Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany ⁴ Technical University Dresden, Dresden, Germany
09:30	The role fluid plays in crack interaction Jing Chen¹ and Manman Hu¹ ¹ Department of Civil Engineering, The University of Hong Kong, Hong Kong
09:50	A Fully Coupled XFEM Model for Simulating a Vertical Fluid-Driven Fracture Breaching Caprock in Anisotropic Layered Formation Ernestos Sarris^{1,2} , Elias Gravanis ³ and Loizos Papaloizou ⁴ ¹ School of Geology, Department of Mineralogy-Petrology-Economic Geology, Aristotle University of Thessaloniki (AUTH), Greece ² Department of Engineering, Oil and Gas Program, University of Nicosia, Nicosia, CY-1700, Cyprus ³ Department of Civil Engineering and Geomatics, Cyprus University of Technology Limassol, CY-3036, Cyprus ⁴ Department of Engineering, Civil and Environmental Engineering Program, University of Nicosia, Nicosia, CY-1700, Cyprus
10:10	Coffee Break
10:40	Stress-dependent permeability decline in a chalk reservoir Euripides Papamichos^{1,2} , Michalis Kattis ³ ¹ Aristotle University of Thessaloniki, Greece ² SINTEF Industry, Trondheim, Norway ³ NTNU Norwegian University of Science and Technology, Trondheim, Norway
11:00	Coupled effect of hydrate saturation and confinement pressure on geomechanical response of gas hydrate bearing sediments Mahima S Rao¹ , Sahil Wani ¹ , Ramesh Kannan Kandasami¹ ¹ Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India
11:20	Acid-assisted subcritical crack propagation in carbonate rocks considering chemical ductillization Xiaojie Tang^{1,2} and Manman Hu² ¹ College of Civil Aviation, Nanjing University of Aeronautics and Astronautics, China ² Department of Civil Engineering, The University of Hong Kong, Hong Kong
11:40	Fluid flow and hydraulic fracturing in soft sands Charalampos Konstantinou^{1,2} and Panos Papanastasiou^{1,2} ¹ Department of Civil and Environmental Engineering, University of Cyprus, Cyprus ² PHAETHON Centre of Excellence, U of Cyprus, Nicosia, Cyprus
12:00	Numerical Investigation on the Influence of Acid-Insoluble Minerals in Acid Wormholing in Carbonates Kenji Furui¹ , Keita Yoshioka ² ¹ Department of Earth Sciences, Resources and Environmental Engineering, Waseda, University, Tokyo, Japan ² Department Geoenergy, Montanuniversität Leoben, Austria
12:20	Time-dependent thermo-viscoplastic deviatoric destressing of salt caprocks Renato Poli¹ , Maria-Aikaterini Nikolinakou ² , D. Nicolas Espinoza ¹ , Kamy Sepehrnoori ¹ ¹ Department of Petroleum and Geosystems Engineering, University of Texas at Austin, Austin, United States ² Bureau of Economic Geology, University of Texas at Austin, Austin, United States
12:40	Impact of Boundary Conditions for Plants in Present and Future M. S. Maddah Sadatiah^{1,2} , A. Tsoampousi ¹ , A. Paschalis^{3,1} ¹ Civil and Environmental Engineering, Imperial College London, London, UK ² Science and Solutions for a Changing Planet DTP, London, UK ³ Civil and Environmental Engineering, University of Cyprus, Nicosia, Cyprus
13:00	A simple 1D model for simulating volume changes in clays caused by variations of the moisture content Dimitrios Loukidis¹ , Georgia Lazarou ¹ , Ploutarchos Tzampoglou ¹ , Thrasivoulos Stylianou ¹ ¹ Department of Civil & Environmental Engineering, University of Cyprus, Nicosia, Cyprus
13:20	Lunch
Session 6. Hydrogen Chairs: Christine Detournay (ITASCA, USA), Yaniv Edery (Technion, Israel)	
14:30	Keynote 5. The future is green (hydrogen): THMC challenges for temporary subsurface hydrogen storage in depleted reservoirs and salt caverns Suzanne Hangx High Pressure and Temperature Laboratory, Department of Earth Sciences, Faculty of Geosciences, Utrecht University, Utrecht, the Netherlands
15:10	Numerical modeling of hydrogen seep in Fairy Circles Christine Detournay¹ , Martin Schöpfer ^{2,3} , Gabor Tari ⁴ ¹ Itasca Consulting Group, Minneapolis, Minnesota, USA ² University of Vienna, Austria ³ NiMBUC Geoscience, Vienna, Austria ⁴ OMV Exploration & Production, Vienna, Austria
15:30	Operational parameters assessment for a prospective pilot demonstration of underground hydrogen storage at Ketzin, Germany Mrityunjay Singh¹ , Anna-Maria Eckel ¹ , Cornelia Schmidt-Hattenberger ¹ , Juliane Kummerow ¹ , Lea Döpp ^{1,2} , Maria Belen Febbo ¹ , Marton Pal Farkas ¹ , Peter Pilz ^{1,2} , Wisdom David, Ingo Sass ^{1,2} ¹ Section 4.3 Geoenergy GFZ Helmholtz Center for Geosciences Department, Potsdam, Germany ² Institute of Applied Geosciences, Technical University Darmstadt, Darmstadt, Germany
15:50	A data-driven analysis for the changes in hydraulic properties of rocks under the presence of hydrogen Eftychia Christodoulou¹ , Charalampos Konstantinou ^{1,2} , Panos Papanastasiou ^{1,2} ¹ Department of Civil and Environmental Engineering, U of Cyprus, Nicosia, Cyprus ² PHAETHON Centre of Excellence, U of Cyprus, Nicosia, Cyprus
16:10	Coffee Break
17:00	Hydro-mechanical behaviour of carbonate reservoir rocks under cyclic hydrostatic loading for hydrogen storage application Zhaochen Xu¹ , Philipp Braun ¹ , Jean Sulem ¹ ¹ Navier, Ecole Nationale des Ponts et Chaussées, Institut Polytechnique de Paris, Univ Gustave Eiffel, CNRS, Marne-la-Vallée, France
17:20	Stress-induced non-Fickian transport in 3D fractured rock Chuanyin Jiang and Qinghua Lei Department of Earth Sciences, Uppsala University, Uppsala, Sweden
17:40	Injection-induced deformation in porous media: the coupling between formation heterogeneity, flow, and strain types Yaniv Edery , Shaimaa Sulieman, Martin Stolar, Evgeny Shavelzon, and Arnold Bachrach Technion, Israel Institute of Technology
18:00	Applicability of equations of state across a range of pressure and temperature conditions for underground hydrogen storage Konstantinos Charalampous^{1,2} , Charalampos Konstantinou ^{1,2} , Panos Papanastasiou ^{1,2} ¹ Department of Civil and Environmental Engineering, University of Cyprus, Cyprus ² PHAETHON Centre of Excellence, U of Cyprus, Nicosia, Cyprus
18:20	Conference Closure



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Registrations: 08:30-12:30

Workshop on Underground Hydrogen Storage (UHS) Workshop Chair: Dr Charalampos Konstantinou <i>Sponsored by Phaethon Centre of Excellence</i>	
09:00	Introduction & Icebreaker (Welcome and agenda overview)
09:15	Mini lecture – Introduction to Green Hydrogen <u>Panos Papanastasiou</u> ^{1,2} ¹ Department of Civil and Environmental Engineering, U of Cyprus, Nicosia, Cyprus ² PHAETHON Centre of Excellence, U of Cyprus, Nicosia, Cyprus
09:45	Mini lecture – Hydrogen geological storage <u>Suzanne Hangx</u> <i>High Pressure and Temperature Laboratory, Department of Earth Sciences, Faculty of Geosciences, Utrecht University, Utrecht, the Netherlands</i>
10:15	Coffee break
10:45	Case Study Challenge – “Storage or Not?” Task: assess feasibility of geological sites using provided data (rock type, depth, integrity, cost, etc.). Deliverable: “Go / No-Go” decision with 2-minute justification per group.
11:15	Mini lecture – The reservoir engineering perspective- depleted gas reservoirs <u>Charalampos Konstantinou</u> ^{1,2} ¹ Department of Civil and Environmental Engineering, University of Cyprus, Cyprus ² PHAETHON Centre of Excellence, U of Cyprus, Nicosia, Cyprus
11:45	Mini lecture – Hydrogen Storage in Bedded Salt: Challenges and Opportunities for Hydrogen Salt Caverns in the US Permian Basin <u>Nicolas Espinoza</u> <i>Hildebrand Department of Petroleum and Geosystems Engineering, The University of Texas at Austin, Austin, USA</i>
12:15	Mini lecture- Pressurized flow deformation and the role of effective stress <u>Yaniv Eder</u> <i>Civil and Environmental Engineering, Technion – Israel Institute of Technology, Haifa, Israel</i>
12:45	Wrap-Up Summary of key takeaways. Invite participants to stay connected or contribute to an open-access white paper or shared database (optional). Quick feedback poll.
13:00	Workshop Closure

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