

Tuesday

September 13



Sanna Mustonen
Project Manager, Posiva Solutions
Oy, Finland

Caroline Darcel
Project Engineer, Itasca Consultants
s.a.s, France

All times are EEST (Eastern European Summer Time)

Venue: Kaleva
Chair: Lauri Uotinen

9:00 **WELCOME**

9:15 **KEYNOTE SESSION**

KEYNOTE 1 - SANNA MUSTONEN

ONKALO® - THE GAME CHANGER IN NUCLEAR ENERGY

KEYNOTE 2 - CAROLINE DARCEL

ROCK MECHANICS AND DFN MODELS IN THE SWEDISH NUCLEAR WASTE
DISPOSAL PROGRAM

10:45 **BREAK, EXHIBITION, NETWORKING & POSTER SESSION** EXHIBITION AREA

Venue: Kaleva

Lumituuli

Palaver

Takka

11:15

SESSION 1

SESSION 2

SESSION 3

SESSION 4

**RECENT ADVANCES IN ROCK
MECHANICS RESEARCH 1**

**FIELD AND LABORATORY
INVESTIGATIONS 1**

MODELLING OF ROCK 1

MECHANICS OF ROCK JOINTS 1

Chair: Charlie Li

Risto Kiuru

Arturo Rubio Ruiz

Mikael Rinne

11:15	Micromechanical characterisation of overburden shales in the Horn River Basin through nanoindentation Dr. Tom Charlton, Newcastle University, United Kingdom	Degradation of fracture characteristics on Coconino sandstone due to water content Prof. Tae Young Ko, Kangwon National University, Republic of Korea	Numerical modelling of rock fragmentation for TBM based on peridynamics Dr. Yuanbai Li, Tongji University, China	Joint behavior during shear process using an innovative equivalent geomaterial and 3D printing technology Abi Aad Emilio, Université de Lorraine, France
11:30	Experimental investigation of the effect of thermal cycling on the thermomechanical properties of three rock varieties for high temperature thermal energy storage Katharina Meta Neumann, Ruhr-University Bochum, Germany	Measuring the hydraulic transmissivity of a rock joint under varying normal load Lars Jacobsson, RISE Research Institutes of Sweden, Sweden	Validation of a Continuum-based Weak Zone Joint Model for Simulating Anisotropic Rock Mass Strength Ryn Ziebarth, Dalhousie University, Canada	Effect of roughness and pore pressure on shear behavior of rock joint under true triaxial loading conditions Dr. Daisuke Asahina, Geological survey of Japan, AIST, Japan
11:45	The exploration of force chains in bonded granular materials: A numerical study Min Zhang, TU freiberg Geotechnical institute, Germany	Evaluating face stability in mountain tunnel excavation by inclination monitoring at the tunnel crown - Atoda tunnel case study Dr. Kazuo Sakai, Taisei Corporation, Japan	Weakening of tensile strength of granitic rock by HV-HF-AC actuation of piezoelectric properties of Quartz: a 3D numerical study Dr. Timo Saksala, Tampere University, Finland	A multi-scale roughness shear joint model using wear theory Min Gao, University of New South Wales, Australia
12:00	Why an indirect estimate of the unjacketed pore modulus may not work Dr. Ali Tarokh, University of Minnesota, USA	A novel method for automated trace discontinuity mapping at the Kemano hydroelectric tunnels in Western Canada Josephine Morgenroth, RockMass Technologies, Canada Samantha Taylor, Hatch Ltd., Canada	Improving Rock Pillar Stability Guidelines Through Detailed Numerical Investigation Evan Dressel, Queen's University, Canada	Evaluation of progressive damage of discontinuity asperities due to shearing by means photogrammetric survey Dr. Maria Teresa Carriero, Polytechnic of Turin, Italy
12:15	A new approach to reduce blasting-induced vibration in tunnel blasting by utilizing the initiation time scatter of detonator Youngmin Yoon, Seoul National University, Republic of Korea	Assessment of static performance of welded mesh along mesh overlap used at Kiirunavaara mine Dr. Ping Zhang, Luleå University of Technology, Sweden	Visco-elastic constitutive law to simulate large creep deformations using particle based simulation approach Miao Zhang, TU freiberg Geotechnical institute, Germany	Toppling of a rock block resting on a rough surface Jingyun Gui, Chang'An University, China
12:30	Assessment of risk of Global slope failure along the right bank of Koteswar Dam reservoir: An integration of Geomatic and Geotechnical approaches Anil Kumar Padoni, THDC India Limited, India			

12:45 **LUNCH, EXHIBITION, NETWORKING & POSTER SESSION** EXHIBITION AREA

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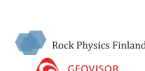


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SITOWISE

Venue:	Kaleva	Lumituuli	Palaver	Takka
13:45	SESSION 5	SESSION 6	SESSION 7	SESSION 8
	RECENT ADVANCES IN ROCK MECHANICS RESEARCH 2	ROCK MASS CHARACTERIZATION 1	MODELLING OF ROCK 2	FIELD AND LABORATORY INVESTIGATIONS 2 & ROCK STRESS MEASUREMENT 1
Chair:	Ping Zhang	Ki-Bok Min	Timo Saksala	Fredrik Johansson
13:45	Early warning of overbreaks in tunnels Manuel Entfellner , Implenia Österreich GmbH, Austria	Application of the rockfall activity rate system (RoARs) Prof. Michael Olsen , Oregon State University, USA	Modelling of progressive failure mechanism of mine pillars Dr. Giuseppe Cammarata , Bentley Systems, Italy	Consideration of the mechanical behaviour and the influence on ground of vertical pre-reinforcement Tomohisa Amemiya , Tokyo metropolitan university, Japan
14:00	Probabilistic characterization of correlation between two rock properties: a data-driven approach Dr. Adeyemi Aladejare , University of Oulu, Finland	Method to obtain 3D point clouds of tunnels using smartphone LiDAR and comparison to photogrammetry Masoud Torkan , Aalto University, Finland	An advanced constitutive model for transversely isotropic rock - Evaluation of two different regularization approaches Thomas Mader , University of Innsbruck, Austria	Fibre Spray Concrete: Testing and Performance Criteria Benoit De Rivaz , Bekaert, France
14:15	Energy Release Resulting from Sudden Excavation Shape Changes during Two-sided Strainbursts Dr. Fedilberto Gonzalez , Queen's University, Canada	A geotechnical evaluation of the Cumba Pit Slope Failure, Dominican Republic Neil Bar , Gecko Geotechnics, Australia	Piezoelectric excitation of quartz in granite for improved drillability Arturo Rubio Ruiz , Tampere University, Finland	Experiences and preliminary results of geophysical methods on historical statues Dr. Federico Vagnon , Politecnico di Torino, Italy
14:30	Numerical and laboratory investigations of thermally induced fractures in rock salt Feline Koerner , Institute for Geotechnical Engineering, Germany	Rapid tunnel scanning using a 360-degree camera and SfM photogrammetry Dr. Mateusz Janiszewski , Aalto University, Finland	A new phase-field mixed-mode failure model for rock fracture and rock slope stability analysis Dr. Yunteng Wang , University of Natural Resources and Life Sciences, Austria	Effect of layer orientation on behaviour of 3D-printed rock specimens in indirect tensile testing Weiye Yang , University of Adelaide, Australia
14:45	Determination of elastic constants of a transversely isotropic rock from a single-orientation core using strip load test and artificial neural network Prof. Ki-Bok Min , Seoul National University, Republic of Korea	Estimating the Hydraulic Conductivity of jointed rock mass using Genetic Programming Prof. Murat Karakus , The University of Adelaide, Australia	A weakening-healing law to simulate stick-slip behavior of rock joint and the associated seismicity Dr. Qingsheng Bai , TU Bergakademie Freiberg, Germany	A methodology for road cutting design guidelines Ellen Robson , Newcastle University, United Kingdom
15:00		Remote mapping and characterization of geological rock-mass features employing advanced data analytics and artificial intelligence. Dr. Mathias Smesnik , AFRY Austria GmbH, Austria	Automatic Extraction of Rockfall Source based on Terrain Analysis Map Using Support Vector Machine Naoko Sakamoto , Okayama University, Japan	

15:15

COFFEE, EXHIBITION, NETWORKING & POSTER SESSION

EXHIBITION AREA

15:45	SESSION 9	SESSION 10	SESSION 11	SESSION 12
	FIELD AND LABORATORY INVESTIGATIONS 3	ROCK MASS CHARACTERIZATION 2	ROCK STRESS MEASUREMENTS 2	ROCK DRILLING
Chair:	Pekka Särkkä	Mateusz Janiszewski	Topias Siren	Mahdi Saadati
15:45	Dynamic compressive behaviour of Rewa shale through SHPB tests Venkatesh M Deshpande , Indian Institute of Technology, India	Geotechnical assessment of rock masses in metallic mineral deposits, a view on the “hidden” issues in open-pit design Elena Angelova , Faculty of civil engineering - Skopje, North Macedonia	Monitoring of rock stress change in deep mine using displacement measurements Dr. Lauri Uotinen , Aalto University, Finland	Drilling Boreholes in Sulphureous Groundwater Areas: Elements of Some Case Studies in Portugal Prof. Luis Manuel Ferreira-Gomes , Univesity of Beira Interior - Covilhã, Portugal
16:00	Evaluation of the Performance of the ISRM Suggested Methods for Measuring Density and Porosity when Applied to Low-Porosity Rocks Risto Kiuru , Aalto University, Finland	Blominmäki - Underground Wastewater Treatment Plant Jari Haapala , AFRY Finland Oy, Finland	Use of flow-back and pressure rebound data improves the minimum stress estimation in a tight clastone formation Christophe de Lesquen , Andra, France	Prediction of Pilot Hole Drilling Performance of Raise Boring Machines based on Raise Inclination and Rock Properties Prof. Hanifi Copur , Istanbul Technical University, Turkey
16:15	Influence of Temperature and Deviatoric Stress on Creep Behavior of Rock Salt Prof. Khalid Alshibli , University of Tennessee, USA	Klaukkala Mt132 bypass: The use of photogrammetric models in engineering geological analyses for excavation and reinforcement design in a BIM environment. Lassi Hatakka , Kalliosuunnittelu Oy Rockplan Ltd, Finland	A Bayesian regression analysis of in situ stress using overcoring data Prof. John P. Harrison , University of Toronto, Canada	Remotely Operated Submersible Drilling Rig for Offshore Rock Investigations Martin Heredia Bilbao , Geociencias y Exploraciones Maritimas (GEM), Spain
16:30	Study of size effects on the peak and residual strength of intact and artificially fissured granite samples Manuel Alejandro González Fernández , University of Vigo, Spain	The challenge of characterization of rock mass in karstic zones case study of a tunnel failure in Jerusalem, ISRAEL Moshe Levin , Geotope-Levin Geological consultants, Israel	Using cavity contraction creep displacements to identify principal stress boundaries in competent rock Yasmin Byrne , Cambridge Insitu Ltd, United Kingdom	Predicting the geological condition beyond the tunnel excavation face using MSP monitoring data and LSTM algorithm Je-Kyum Lee , Hanyang University, Republic of Korea
16:45	Laboratory-scale Rockburst Physical Model Testing Using a True-Triaxial Cell Doandy Yonathan Wibisono , Colorado School of Mines, USA	Potential applications of deep learning in automatic rock joint trace mapping in a rock mass Jessica Kayi Chiu , Norwegian Geotechnical Institute, Norway	An investigation on relations between energy dissipation and dynamic compressive strength of Kemi-Peridotite at high strain rates Toochukwu Ozoji , University of Oulu, Finland	
17:00	Hybrid InSARTrac for Monitoring Interglacial Movement Patterns Christoph Zambanini , Graz University of Technology, Austria	Effects of uncertainties on block volume estimation Prof. Gessica Umili , University of Turin, Italy	Discrete Element Method Simulation of Borehole Breakout Based on the Strain Energy Concept Zizhuo Xiang , University of New South Wales, Australia	

19:00

DINNER

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Wednesday

September 14

Venue: Kaleva,
Chair: Lauri Uotinen

9:00 KEYNOTE SESSION

KEYNOTE 3 - MICHAEL DI GIOVINAZZO

PRACTICAL APPLICATION OF ROCK ENGINEERING TECHNIQUES IN MINE PLANNING AND OPERATIONS – FROM CHARACTERISATION TO IMPLEMENTATION

KEYNOTE 4 - JOHN HARRISON

IS EUROCODE 7 THE FUTURE OF ROCK ENGINEERING?



Michael Di Giovino

Principal Consultant - Mining Geomechanics Engineer at SRK Consulting, Member Australasian Institute of Mining and Metallurgy, AusIMM, Finland



John Harrison

W.M. Keck Chair of Engineering Rock Mechanics Lassonde Institute of Mining Dept. of Civil & Mineral Engineering University of Toronto, Canada

10:30 BREAK, EXHIBITION, NETWORKING, POSTER SESSION EXHIBITION AREA

Venue: Kaleva

Lumituuli

Palaver

Takka

11:00

SESSION 13

SESSION 14

SESSION 15

SESSION 16

FIELD AND LABORATORY INVESTIGATIONS 4

ROCK MASS CHARACTERIZATION 3

CASE STUDIES

ROCK ENGINEERING

Chair: Risto Kiuru

Mateusz Janiszewski

Hyung-Mok Kim

Ignacio Perez Rey

11:00	An approach to estimate influence region of field investigation sampling points, investigation zone in civil infrastructure projects and brief review of existing field investigation process. Naval Singh, Atkins Sverige AB, Sweden	Definition of Structural Domains Using Acoustic Borehole Image Televiewer Data in Minera Los Frailes Mining Site, Sevilla, Spain Martín Heredia Bilbao, Geociencias y Exploraciones Marítimas (GEM), Spain	Rock engineering challenges in Lyyra (city block of science and economy), Helsinki, Finland Ulla Sipola, Sitowise Oy, Jesse Ström, Rock Mechanics Consulting Finland Oy (RMCF), Terhi Seppälä, Sitowise Oy, Finland	Impact identification on flexible rockfall barriers: on site test of a wireless monitoring system Prof. Andrea Segalini, Università di Parma, Italy
11:15	The pressure dependent elastic anisotropy of Grimsel granite and Bukov paragneiss Dr. Ali Aminzadeh, Institute of Geology of the Czech Academy of Sciences, Czech Republic	Assessment of the creep behavior of siltstone for the Snowy 2.0 hydropower station using multistage uniaxial creep tests Samer Abou Kheir & Andrea Brogiato, Tractebel, France	Managing geotechnical risk in high-uncertainty environments Iñaki García Castro, SRK Consulting, United Kingdom	The Effect of Notches on Breakdown Pressure during Hydraulic Fracturing at various stress regimes Ben Powlay, The University of Adelaide, Australia
11:30	Laboratory block model tests simulating rock anchoring in rock mass Bjarte Grindheim, Norwegian University of Science and Technology (NTNU), Norway	Interpreting ultrasonic pulse velocities and elastic properties of lac du bonnet granite under compression Mark McDonald, Queen's University, Canada	Mechanical and physical characterization mapping of evaporitic rocks from Abu Dhabi city and its surroundings Prof. Hasan Arman, United Arab Emirates University, United Arab Emirates	Coupled Thermo-Mechanical Study of Crack Initiation Stress Threshold in Porous Sandstone Dr. Mehdi Serati, University of Queensland, Australia
11:45	Experimental Device for the Determination of Fracture Toughness at High Pressure Prof. Jordi Delgado Martin, University of A Coruña, Spain	3D slope stability analysis of a limestone quarry expansion in Northern Italy Dr. Daniele Martinelli, Politecnico di Torino, Italy	High-speed train induced vibration measurements in fresh tunnel shotcrete layer Mikael Dahlström, Sweco, Finland	Excavation of road tunnels with zero... negative rock cover Jukka Salminen, AFRY Finland Oy
12:00	Tensile strength of anisotropic rocks from enhanced Brazilian laboratory testing and data analysis protocols Timothy Packulak, Queen's University, Canada	The Karavanke Tunnel – 30 years later Julija Fux, IRGO Consulting d.o.o., Slovenia	Cavern Thermal Energy Storage – The future of heating cities Teemu Routa, AFRY Finland Oy, Finland	A preliminary study of hydro-mechanical properties for bentonite-sand mixture Prof. Tomoyoshi Nishimura, Ashikaga University, Japan
12:15	Is soft rock also non-abrasive rock? An evaluation from lab testing campaigns Dr. Markus Kaspar, TU Graz, Austria	Cross-scale rockmass characterization by high resolution seismic imaging around tunnels Dr. Calin Cosma, Vibrometric, Finland	Investigation, numerical model, and monitoring for Follo line - a metro project in Oslo Dr. Nghia Trinh, SINTEF, Norway	Identifying parameters with high impact on the swelling of clay-sulfate rocks using coupled HM modeling and machine learning approaches Dr. Reza Taherdangkoo, TU Bergakademie Freiberg, Germany

12:30 LUNCH, EXHIBITION, NETWORKING & POSTER SESSION EXHIBITION AREA

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SITOWISE

Venue:	Kaleva	Lumituuli	Palaver	Takka
13:30	SESSION 17	SESSION 18	SESSION 19	SESSION 20
Chair:	GEOLOGICAL DISPOSAL OF SPENT NUCLEAR FUEL 1 Erik Johansson	ROCK SUPPORT 1 Daniele Martinelli	JOINTED ROCK MASS BEHAVIOUR Leandro Alejano	GEOPHYSICS IN ROCK MECHANICS Timo Saksala
13:30	Clay–rock fracturing risk assessment under high gas pressures in repository systems Dr. Mostafa Mollaali , Helmholtz Centre for Environmental Research, UFZ, Leipzig, Germany	Simulation of wire mesh bearing capacity using the distinct element method (DEM) Rodrigo Winderholler , Rock Mechanics Consulting Finland, Finland	Detection of geometric properties of discontinuities on the Špičunak rock slope (Croatia) using high-resolution 3D Point Cloud generated from Terrestrial Laser Scanning Hrvoje Lukačić , University of Zagreb, Croatia	Analysis of the Permeability Change Resulting from Active Mineral Precipitation in Pores of Rocks by 3D-DEM Arkin Eldan , Kumamoto University, Japan
13:45	Numerical Approach to Evaluate the Influence of Water Saturation on the Strength of Neogene Tuff in Utsunomiya city, Japan Neranjana Ranaweera , Saitama University, Japan	A Multimodel Bayesian Reliability Analysis for a Rock Slope to Counter Data Insufficiency Akshay Kumar , Research Scholar at Indian Institute of Technology Kanpur, India	Explicit numerical models for the prediction of plastic and weakening rockmass behaviour around a circular tunnel in isotropic and anisotropic stress conditions Caitlin Fischer , Queen's University, Canada	Some thoughts on rock slope stability issues in Mars Prof. Ömer Aydan , University of the Ryukyus, Japan
14:00	Estimation of site-specific disposal spacings of high-level radioactive waste repository in South Korea based on geothermal gradient and rock mass properties. Dr. Kwang-Il Kim , Korea Atomic Energy Research Institute, Republic of Korea	Stability analysis of tunnel composite liner using convergence-confinement method and support capacity diagram – A case study of the Notog railway tunnel in Indonesia Dr. Simon Prasetyo , Institut Teknologi Bandung, Indonesia	The rock mass and the development of joints during the tunnel excavation Prof. Wagdi Y , Central University of Venezuela, Venezuela	Development and verification of a long distance survey ahead of the tunnel face using excavation blasting as seismic source Dr. Masahito Yamagami , Taisei Corporation, Japan
14:15	Effects of initial stress and spalling strength on spalling around deposition holes and tunnels Dr. Bruno Figueiredo , Itasca Consultants AB, Sweden	The effectiveness of epoxy coating for preventing microbially induced corrosion of rock bolts Dr. Hamed Lamei Ramandi , School of Minerals and Energy Resources Engineering, UNSW Sydney, Australia	Influence of Geological Conditions on the Design and Construction of the Carlberg Main Tunnel. A case study in large railway tunnel in Moss (Norway), with low rock overburden in an urban area near deposits of sensitivity material. Francisco Planells Valero , Acciona Ingenieria, Spain	Experimental study on the effect of changes in pore water pH on friction coefficient of rock Hinako Hosono , Nihon University, Japan
14:30	Analysis and determination of the stress field at the Olkiluoto site Dr. Bruno Figueiredo , Itasca Consultants AB, Sweden	Design of falling rock preventive countermeasure based on three-dimensional simulation Hiroaki Kitauchi , Okayama University, Japan	Blominmäki wastewater treatment plant's sewage tunnels: Challenging connection of a vertical shaft to the existing operating offshore tunnel. Ioannis Konstantas , Kalliosuunnittelu Oy Rockplan, Finland	Application of the shear-tensile source model to acoustic emissions induced by uniaxial loading of Westerly granite Dr. Matej Petruzalek , Institute of Geology of the Czech Academy of Sciences, v.v.i., Czech Republic
14:45	Experimental hydraulic fracturing of CO ₂ claystone through thermal pressurization Dr. Philipp Braun , Ecole des Ponts ParisTech, CNRS, France	Cost-effectiveness of road slope stabilisation Ellen Robson , Newcastle University, United Kingdom	An issue in the current definition of the factor of safety for rock slopes and suggestions for improvement Prof. Charlie Chunlin Li , Norwegian University of Science and Technology (NTNU), Norway	Monitoring Fracture Saturation using Transportable Acoustic Sources and a Neural Network Differential Autoencoder Prof. David Nolte , Purdue University, USA

15:00 COFFEE, EXHIBITION, NETWORKING & POSTER SESSION EXHIBITION AREA

15:30	SESSION 21	SESSION 22	SESSION 23	SESSION 24
Chair:	GEOLOGICAL DISPOSAL OF SPENT NUCLEAR FUEL 2 Erik Johansson	ROCK SUPPORT 2 Daniele Martinelli	FIELD AND LABORATORY INVESTIGATIONS 5 Gessica Umili	ROCK ENGINEERING AND MINING EDUCATION Pekka Särkkä
15:30	TOUGH-3DEC: a three-dimensional discontinuum-based simulator for coupled thermo-hydro-mechanical analysis Dr. Saeha Kwon , Korea Atomic Energy Research Institute, Republic of Korea	Rational Design Concept for Inverted Arch Structure for Mountain Tunnel Takuto Natsume , Tokyo metropolitan university, Japan	Terrafame Slope Stability monitoring: the integration between GNSS, ground-based and satellite InSAR Aki Ullgren , Terrafame Oy, Finland	The Allegory of the Rock Engineering Cave Dr. Davide Elmo , University of British Columbia, Canada
15:45	An interpretation of the fracture open fraction distribution in Forsmark (Sweden) as the result of fracture reactivation by fluid overpressures Dr. Philippe Davy , Univ Rennes, CNRS, Geosciences Rennes, France	Laboratory study of the behaviour of grouted cable bolts under static and dynamic axial loading Sina Anzanpour , University of Wollongong, Australia	Experimental study on fracture processes of granite cylinders with different decoupling conditions Yang Qiao , University of Oulu, Finland	Data Preparation for Machine Learning in Rock Engineering Beverly Yang , University of British Columbia, Canada
16:00	Understanding and predicting stress fluctuations induced by multiscale fracture networks in naturally fractured rocks Dr. Caroline Darcel , Itasca Consultants s.a.s., France	An empirical review of the effect of pre-support cablebolt installation on overbreak in Long Hole Open Stopes (LHOS) at Tara Mines Marta Diaz Losas , Tara Mines, New Boliden, Ireland	Experimental assessment of dynamic loading response of grouted non-persistent joint rock Sachin Kumar , Indian Institute of Technology Kanpur, India	An example of digital field training for a diversity-friendly (and pandemic-proof) field education in geoenengineering disciplines Julia Godlewska , Ruhr-University Bochum, Germany
16:15	Analysis of Fault reactivation and surface ground behavior around the geological repository of HLW Eunjin Seo , Seoul National University, Republic of Korea	Tunneling in heterogeneous ground: an update of the PBE code accounting for the uncertainty in estimates of block quantities from site investigations Dr. Maria Lia Napoli , Politecnico di Torino, Italy		Comparison of different methods to characterise the abrasivity potential and mechanical properties of carbonates with respect to its relevance for practical purposes in excavation technologies Moritz Aderhold , Ruhr-University Bochum, Germany

16:45 CLOSING SESSION

Chair: Lauri Uotinen

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Posters

A brief review of the effect of wildfires on rockfall occurrence
Dr. Ignacio Pérez-Rey, Laboratorio de Geotecnia, CEDEX, Spain

A Methodology for the Analysis of Tunnel Intersections Using Two-dimensional Numerical Modeling
Dr. Davide Elmo, University of British Columbia, Canada

A new experimental device developed to study the creeping behavior of a rock joint under shear stress
Sophie Jung, Ecole Nationale des ponts et chaussées, France

A New Explanation of Loading Rate Effect on Rock Compressive Strength
Dr. Jun Zhu, Chinese Academy of Sciences (CAS), China

A Numerical Investigation on the Effect of Screen Size on the Sand Production Issue in the Oil Wells
Prof. Hyung-Mok Kim, Sejong University, Repblic of Korea

A numerical study on THM coupled behavior in the high-level radioactive waste disposal system
Dr. Taehyun Kim, Korea Atomic Energy Research Institute, Republic of Korea

A review on the application of cohesive zone model in hydraulic fracturing
Dr. Xuejiao Li, China University of Petroleum, China

A study on the characteristics of deep bedrock of Korea's representative rock types for HLW geological disposal
Dr. Dae-Sung Cheon, Korea Institute of Geoscience and Mineral Resources, Republic of Korea

An experimental study on division of fracture ligament and evolution of fracture process zone in sandstone
Yang Qiao, University of Oulu, Finland

Application of DInSAR for monitoring slopes around a dam basin in Japan
Yukiko Shoji, Electric Power Development Co., Ltd., Japan

Application of Seismic Sensors on Measurement While Drilling for Real-time Rock Property Detection
Dr. Manoj Khanal, Commonwealth Scientific and Industrial Research Organization, Australia

A refined evaluation method for the stress field of the Chang 73 shale oil reservoir of northern Shaanxi
Prof. Bing Hou, China University of Petroleum, China

Assessing the tunnel stability in brittle rocks based on strain bursting assessment
Dr. Chrysothemis Paraskevopoulou, University of Leeds, United Kingdom

Biaxial Loading of Brazilian Disc Samples
Dr. Mehdi Serati, The University of Queensland, Australia

Characterisation of Fine Particles Generated at Draw Points During Sub-Level Cave Mining for Assessment of Mud Inrush Hazard
Dr. Matthew Musolino, Oz Minerals, Australia

Close-range photogrammetry for rock mass characterization and risk assessment
Dr. Mateusz Janiszewski, Fractuscan Ltd, Finland

Design of pin-on-disk type abrasion testing machine for wear assessment of rock cutting tools
Mun-Gyu Kim, Kyungpook National University, Republic of Korea

Effect of anisotropic creep on the convergence of deep drifts in Callovo-Oxfordian claystone
Sophie Jung, Ecole Nationale des ponts et chaussées, France

Effect of anisotropy of fracture surface on fluid flow
Masoud Torkan, Aalto University, Finland

Effect of anisotropy on the hydro-mechanical coupled behavior of a metamorphic rock mass
Prof. Meng-Chia Weng, National Yang Ming Chiao Tung University, Taiwan

Empirical mode decomposition approach to simplify the fracture roughness for numerical models
Masoud Torkan, Aalto University, Finland

Estimation of indentation force of chisel in rock cutting-plitting method by scaled model tests
Sang-Hwa Yu, Hocang Engineering

Evaluation of displacement prediction method for mountain tunnels showing time-dependence characteristics
Makoto Uda, Tekken Corporation, Japan

Evaluation of surface roughness of rock-like joints using close range photogrammetry method
Masoud Torkan, Aalto University, Finland

Experimental study of aging-induced cementation effect on permeability property of bentonites
Daichi Ito, Waseda University, Japan

Experimental study of frictional resistance influences on tunnel face stability
Ryo Kawanoue, Saitama University, Japan

Fluid flow of various configurations in a rock-proppant-system
Lucas Conrad Witte, Ruhr University Bochum, Germany

Geomechanical characterization and analysis of the influence of durability tests on metabasalts
Dr. Eduardo Marques, Federal University of Viçosa, Brazil

Geometrical aspects in the consideration of actual opposed surface along shearing direction in rock joints
Dr. Diego-José Guerrero-Miguel, DinRock Group. University of Oviedo, Spain

Geotechnical Characterization of an Amphibolite from Baixada Santista – Sp, Brazil
Dr. Eduardo Marques, Federal University of Viçosa, Brazil

Identifying the "unidentifiable" contributors to large-scale instability experienced at a UG2 mine along the Western Limb of the Bushveld Complex
Shaune Liebenberg, Sibanyestillwater, South Africa

Instrumental response of borehole tensor strainmeters for oblique-incident seismic waves
Prof. Jiayong Tian, National Institute of Natural Hazards, Ministry of Emergency Management, China

Intact rock deformation bimodularity: an experimental study
Dr. Mauro Muñiz-Menéndez, Laboratorio de Geotecnia, Spain

Interpretation of changing pore pressure on heated unsaturated/saturated bentonite-sand mixture
Prof. Tomoyoshi Nishimura, Ashikaga University, Japan

Management of contaminated water at the Sulkavuori Wastewater Treatment Plant during the excavation phase
Cassandra af Hällström, Kalliosuunnittelu Oy Rockplan Ltd, Finland

Morphological and physical-mechanical characterization of a syenogranite weathering profile developed on tropical climate
Dr. Eduardo Marques, Federal University of Viçosa, Brazil

Numerical simulation of rock cutting performace of a 130t Roadheader
Dr. Jung-Woo Cho, Korea Institute of Industrial Technology, Republic of Korea

Prediction of Blast Vibration Coefficients of Rockmass for the Unknown Cases from the Vibration Records
Dr. Myung Kyu Song, Hyundai E&C, Republic of Korea

Predicting rockburst damage scale in seismically active mines using a classifier ensemble approach
Dr. Amoussou Adoko, Nazarbayev University, Kazakhstan

Riskcoast: a south european approach for coastal landslide hazard: presentation and French results
Dr. Muriel Gasc, cerema, France

Static and Dynamic Stability of Rock Boulders on Slopes
Prof. Ömer Aydan, University of the Ryukyus, Japan

Synergies between Heat- and Stress-Induced Spalling Theory Applied to Rock and Concrete in Tunnel Applications
Dr. Mehdi Serati, The University of Queensland, Australia

The Influence of Roof Lithology on the Fracture Propagation of Horizontal Well Multistage Fracturing in the Roof of Broken Soft Coal Seams
Dr. Xuejiao Li, China University of Petroleum, China

The relict landslide in bimsoils in downtown Genova, Italy: a new modeling approach
Prof. Monica Barbero, Politecnico di Torino, Italy

Thermally induced shear reactivation of critically-stressed smooth and rough granite fractures
Changlun Sun, Korea institute of civil engineering and building technology, Republic of Korea

Use of a thermoplastic resin to generate rock surface impressions and geometrically accurate replicas
Dr. Mai Sawada, Kyoto University, Japan

Validation of the Crack Mode-Changing Stress in Circular Tunnels Under Generalized Triaxial Tensile Stress States
Dr. Mehdi Serati, The University of Queensland, Australia

Verification of Spalling Tensile Strength of Rocks using 3D GPGPU-accelerated Hybrid FEM/DEM
Dr. Gyeongjo Min, Jeonbuk National University, Republic of Korea

Vertical Well Assisted Hydraulic Fracturing in Mudstone Interlayer of Terrestrial Ultra-heavy Oil Reservoir
Qiqi Wang, China university of Petroleum, China

Virtual reality learning system for remote rock mass mapping
Dr. Mateusz Janiszewski, Aalto University, Finland

Vulnerability Assessment of Different Types of Building Structures to Debris Flow Events
Tanja Miteva, HEIG-VD, Switzerland

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