

**International Conference on Coupled Processes
in Fractured Geological Media: Observation,
Modeling, and Application**

Invitation

The International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application invites you to Seoul, Korea, November 11-13, 2020. The conference, in succession of the 1st one in Wuhan, China in 2018, will focus on new and exciting advances in all areas of coupled processes associated with fractured geological media, including numerical methods, in-situ tests, lab experiments and applications to different subsurface engineering activities. The CouFrac2020 consists of oral and poster presentations, a panel discussion on nuclear waste disposal, keynote presentations and special sessions of emerging young scientists. Selected papers will be submitted for inclusion in special issue of 'Geomechanics for Energy and the Environment' journal. For further detail information, please visit the Conference website (<http://www.coufrac2020.org>). We look forward to meeting you in Seoul.

Chair of the Conference,
Jonny Rutqvist (LBNL)

Co-Chairs of the Conference,
Antonio Rinaldi (ETH Zürich),
Hideaki Yasubara (Ehime University)

Chairs of Local Organizing Committee,
Ki-Bok Min (SNU),
Eui-Seob Park (KIGAM)

CONTACT INFORMATION

Prof. Hyung-Mok Kim (Sejong University)
Secretary General of the Conference
E-mail: hmkim@sejong.ac.kr

Dr. Linmao Xie (SNU)
Co-Secretary General of the Conference
E-mail: xielinmao@snu.ac.kr

Website <http://www.coufrac2020.org>

CALL FOR PAPERS

Every subject area of coupled thermal-hydro-mechanical-chemical (THMC) processes in fractured geological media are invited to submit.

VENUE

Global Education Center for Engineers (GECE) Convention, Seoul National University, Seoul, Korea

IMPORTANT DATES

- **May 15**, Deadline for Abstract Submission & Chin-Fu Tsang Coupled Processes Award Nomination
- **June 1**, Notification to Authors on Acceptance
- **September 1**, Deadline for Extended Abstract Submission & Early Registration

REGISTRATION FEE

- Registration **before Sept. 1, 2020** (ISRM Delegate / Non-ISRM Delegate / Student): \$500 / \$600 / \$250
- Registration **after Sept. 1, 2020** (ISRM Delegate / Non-ISRM Delegate / Student): \$600 / \$720 / \$300

PUBLICATION

Selected papers will be published in a special issue of 'Geomechanics for Energy and the Environment' after a review.

TENTATIVE PROGRAM

- **November 11 (Wed)** : Keynote lectures, General sessions, Panel discussion and Reception
- **November 12 (Thu)** : Keynote and Chin-Fu Tsang Award lectures, General sessions, and Banquet
- **November 13 (Fri)** : Plenary Sessions of Emerging Scientists, Keynote lectures, General sessions

KEYNOTE SPEAKERS



Inga Berre
(U. of Bergen)

Mathematical and numerical modeling of coupled subsurface dynamics due to fluid injection in fractured formations



Francois Cornet
(U. of Strasbourg)

Effective stresses and the development of large scale failure in rock masses



Tomasz Hueckel
(Duke U.)

Phenomenological versus mechanism modeling of multiphysics coupling in fracturing geomaterials



Takatoshi Ito
(Tohoku U.)

A breakthrough in rock stress measurement applicable deep and high temperature environment



Chun'an Tang
(Dalian U. of Technology)

TOUGH-RFPA:
A coupled thermal-hydro-mechanical rock failure process analysis simulator



Ki-Bok Min
(Seoul National U.)

Ove Stephansson memorial lecture:
Outstanding issues in coupled process for engineering fractured rock mass at depth



**International Conference on Coupled Processes in Fractured Geological Media:
Observation, Modeling, and Application**

PANEL DISCUSSION

Past, current and future of coupled processes in fractured rock: Nuclear waste disposal research as the main driver for research and development on coupled processes in fractured rocks over the past 40 years



Host
Jonny Rutqvist
(LBNL)



Gilles Armand
(ANDRA)



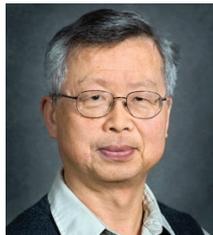
Jens Birkholzer
(LBNL)



Diego Mas Ivars
(SKB)



Haeryong Jung
(KORAD)



Chin-Fu Tsang
(Uppsala U.)



Ju Wang
(Beijing Research Institute of Uranium Geology)

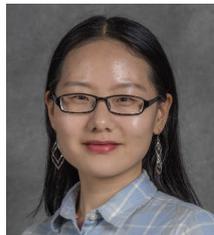


Hideaki Yasuhara
(Ehime U.)

PLENARY SESSION FOR EMERGING SCIENTISTS



Kyung Won Chang
(SNL)
Multiphysics-based assessment of geological hazards associated with subsurface energy activities



Mengsu Hu
(LBNL)
Modeling coupled processes in fractured media at multiple scales



Takuya Ishibashi
(AIST)
Static / Dynamic characteristics of permeability structure within the fractured rocks



Peter K Kang
(U. of Minnesota)
Predicting fluid flow and reactive transport in fracture media across scales



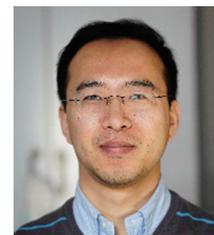
Yusuke Mukuhira
(Tohoku U.)
The physics of induced seismicity discovered by geomechanics and microseismic analysis



Jung-Wook Park
(KIGAM)
Continuum and discontinuum approaches for modeling thermal, hydrological and mechanical processes in rock



Fengshou Zhang
(Tongji U.)
Modeling hydraulic fracturing complexity in naturally fractured rock masses: challenge and opportunity



Zhihong Zhao
(Tsinghua U.)
Coupled stress / damage-flow-heat / solute transport processes in rock fractures

CHIN-FU TSANG COUPLED PROCESSES AWARD

The Award was established to recognize outstanding contribution of an early career geoscientist to THMC coupled processes in fractured geological media. The winner will be presented a certificate as well as a honorarium to support his/her travel to the Conference. An award lecture by the recipient will be given during the Conference. For more details on nomination, please see the Conference website.

SHORT COURSES

Two days short courses on 9th (Mon) and 10th (Tue)

- **CrunchFlow / CrunchClay**, Carl I. Steefel (LBNL) & Christophe Tournassat (BRGM)
- **Reservoir geomechanics**, Maurice B. Dusseault (U. of Waterloo)



International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application

SPECIAL SESSIONS

- **Scientific machine learning applications for coupled processes in the subsurface**
- Conveners: Hongkyu Yoon(SNL), Hoonyoung Jeong (SNU)
- **Development of coupled processes and their validation in nuclear wastes disposal (DECOVALEX)**
- Conveners: Alexander Bond (Quintessa Ltd), Changsoo Lee (KAERI)

SESSIONS

- **Coupled Thermo-Hydro-Mechanical-Chemical (THMC) processes in single fractures**
- Conveners: Zhihong Zhao, Yuedu Chen
- **Advances in computation of coupled processes in fractured media across scales: numerical modeling and machine learning**
- Conveners: Mengsu Hu, Adriana Paluszny, Pania Newell, Shaojun Li, Laura Blanco Martin
- **Mechanics of induced seismicity: managing complexity from lab to field scale**
- Conveners: Víctor Vilarrasa, Roman Makhnenko, Francesco Parisio, Qi Li
- **Coupled multiphysics during coal gas and shale gas extraction**
- Convener: Wancheng Zhu
- **Numerical modelling of long term THM coupled processes in fractured hard rock**
- Convener: Diego Mas Ivars
- **Coupled THM hard rock fracture behaviour – laboratory experiments and numerical modelling**
- Convener: Diego Mas Ivars
- **Coupled THM field experiments in fractured hard rock**
- Conveners: Diego Mas Ivars, Shaojun Li, Jeoung Seok Yoon
- **Advances in fluid injection induced shear slips on natural fractures**
- Conveners: Fengshou Zhang, Li Zhuang, Takuya Ishibashi

- **Mechanics of Hydraulic Fracturing in Naturally Fractured Reservoirs**
- Conveners: Fengshou Zhang, Li Zhuang, Takuya Ishibashi
- **Coupled seismo-thermo-hydro-mechanical-chemical processes in natural fracture networks: from field observation to numerical simulation**
- Conveners: Qinghua Lei, Jeoung Seok Yoon
- **Long term behavior of fractured geological media under coupled THMC environment**
- Convener: Pengzhi Pan
- **Experimental Studies for Fracture Characterization of Rock across Scales**
- Convener: Pania Newell
- **THMC coupling in geological CO2 storage: from lab to the field scale**
- Conveners: Roman Makhnenko, Víctor Vilarrasa, Laura Blanco Martin
- **Numerical modelling of coupled thermo-hydro-mechanical processes in fractured rocks**
- Convener: Bruno Figueiredo
- **Numerical modelling of coupled thermo-hydro-mechanical processes associated with hydraulically induced fracture propagation**
- Convener: Bruno Figueiredo
- **Numerical modelling of the interaction of coupled thermo-hydro-mechanical processes and complex geological settings and heterogeneities**
- Convener: Bruno Figueiredo
- **Understanding Individual and Coupled Processes through Geo-architected Materials across Scales**
- Convener: Pania Newell
- **Advances in discontinuum-based simulation of coupled processes during rock progressive failure**
- Convener: Andrea Lisjak
- **THMC coupling in clays**
- Conveners: Christophe Tournassat, Carl I. Steefel
- **Enhanced Geothermal Systems (EGS)**
- Conveners: Hannes Hofmann & Günter Zimmermann

INTERNATIONAL SCIENTIFIC ADVISORY COMMITTEE

- Ömer Aydan**
University of the Ryukyus
- Jens Birkholzer**
Lawrence Berkeley National Laboratory
- Patrick Dobson**
Lawrence Berkeley National Laboratory
- Maurice B. Dusseault**
University of Waterloo
- Derek Elsworth**
Pennsylvania State University
- Xia-Ting Feng**
Chinese Academy of Sciences
- Yves Guglielmi**
Lawrence Berkeley National Laboratory
- Manchao He**
China University of Mining & Technology
- Takatoshi Ito**
Tohoku University
- Seokwon Jeon**
Seoul National University
- Lanru Jing**
KTH Royal Institute of Technology
- Olaf Kolditz**
Helmholtz Centre for Environmental Research (UFZ)
- Suseno Kramadibrata**
ISRM Vice President for Asia
- Jishan Liu**
University of Western Australia
- Joseph Morris**
Lawrence Livermore National Laboratory
- Yuzo Ohnishi**
Kansai University
- Laura J. Pyrak-Nolte**
Purdue University
- Yang Qiang**
Tsinghua University
- Patrick Selvadurai**
McGill University
- Serge Shapiro**
Free University of Berlin
- Baotang Shen**
Commonwealth Scientific and Industrial Research Organisation
- Carl Steefel**
Lawrence Berkeley National Laboratory
- Chun'an Tang**
Dalian University of Technology
- Chin-Fu Tsang**
Lawrence Berkeley National Laboratory
- Arno Zang**
GFZ German Research Centre for Geosciences
- Dongxiao Zhang**
Peking University
- Robert Zimmerman**
Imperial College London

**International Conference on Coupled Processes in Fractured Geological Media:
Observation, Modeling, and Application**

ORGANIZING COMMITTEE

- Jonny Rutqvist**
Lawrence Berkeley National Laboratory (Chair)
- Ki-Bok Min**
Seoul National University (Co-Chair)
- Antonio Pio Rinaldi**
ETH Zürich (Co-Chair)
- Hideaki Yasuhara**
Ehime University (Co-Chair)
- Hyung-Mok Kim**
Sejong University (Secretary General)
- Laura Blanco-Martin**
Mines ParisTech
- Bruno Figueiredo**
Itasca Stockholm
- Hannes Hofmann**
GFZ German Research Centre For Geosciences
- Mengsu Hu**
Lawrence Berkeley National Laboratory
- Diego Mas Ivars**
Swedish Nuclear Fuel & Waste Management Company
- Changsoo Lee**
Korea Atomic Energy Research Institute
- Qinghua Lei**
ETH Zürich
- Qi Li**
Institute of Rock and Soil Mechanics, CAS
- Shaohun Li**
Institute of Rock and Soil Mechanics, CAS
- Weiguo Liang**
Taiyuan University of Technology
- Andrea Lisjak**
Geomechanica Inc
- Roman Makhnenko**
University of Illinois at Urbana-Champaign
- Pania Newell**
University of Utah
- Adriana Paluszny**
Imperial College London
- Pengzhi Pan**
Institute of Rock and Soil Mechanics, CAS
- Francesco Parisio**
Technische Universität Bergakademie Freiberg
- Xuhai Tang**
Wuhan University
- Victor Vilarrasa**
Spanish National Research Council
- Sheng-Qi Yang**
China University of Mining and Technology
- Jeoungseok Yoon**
Helmholtz Centre Potsdam
- Fengshou Zhang**
Tongji University
- Zhihong Zhao**
Tsinghua University
- Wancheng Zhu**
Northeastern University
- Günter Zimmermann**
GFZ German Research Centre for Geosciences

LOCAL ORGANIZING COMMITTEE

- Ki-Bok Min**
SNU (Chair)
- Eui-Seob Park**
KIGAM (Co-Chair)
- Yong-Bok Jung**
KIGAM (Associate Chair)
- Kwang Yeom Kim**
Korea Maritime & Ocean University (Associate Chair)
- Changsoo Lee**
KAERI (Associate Chair)
- Hyu-Soung Shin**
KICT (Associate Chair)
- Hyung-Mok Kim**
Sejong University (Secretary General)
- Linmao Xie**
SNU (Co-Secretary General)
- Chandong Chang**
Chungnam National University
- Dae Sung Cheon**
KIGAM
- JungWoo Cho**
Korea Institute of Industrial Technology
- Gyu Hyun Go**
Kumoh National Institute of Technology
- Hoonyoung Jeong**
Seoul National University
- Hyunwoo Kim**
KIGAM
- Kunhwui Kim**
Geologica Geothermal Group
- Sangki Kwon**
Inha University
- Dae Sung Lee**
Dong-A University
- JaeWon Lee**
Korea Atomic Energy Research Institute
- Youn-Kyou Lee**
Kunsan National University
- Bona Park**
Korea Institute of Nuclear Safety
- Chan-Hee Park**
KIGAM
- JungWook Park**
KIGAM
- Jae-Joon Song**
Seoul National University
- Jeoung Seok Yoon**
DynaFrax UG
- Tae Sup Yun**
Yonsei University
- Li Zhuang**
KICT

ORGANIZED BY

-  **SEOUL NATIONAL UNIVERSITY**
-  **BERKELEY LAB**
Lawrence Berkeley National Laboratory
-  **中国科学院**
CHINESE ACADEMY OF SCIENCES
-  **KIGAM** Korea Institute of Geoscience and Mineral Resources
-  **KAERI** Korea Atomic Energy Research Institute
-  **KICT** KOREA INSTITUTE OF CIVIL ENGINEERING and BUILDING TECHNOLOGY
-  **KSRM** KOREAN SOCIETY FOR ROCK MECHANICS

SPONSORED BY

-  **DynaFrax** Experts in Dynamics of Rock Fractures for GeoCoupledProcess Modelling and GeoHazardRisk Analysis
-  **ALTSOFT** Multiphysics Simulation

