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INTERPORE News

Issue #05, 5 March 2020

Dear InterPore friends,

Strange times, these days! Our modus operandi is meeting each other for fruitful discussions, yet the spread of the novel coronavirus is requiring us to do exactly the opposite. Fortunately, China is seeing a decline of the virus, and hopefully, the rest of the world will soon follow suit, so we can look forward to our rescheduled InterPore2020 meeting.




Meanwhile, we also have online means for fruitful discussions and exchange of information (despite the "world wide web" also not being virus-free...). We're happy to report here on a successful kick-off meeting of the Spanish InterPore chapter, as well as a new chapter in the making in Greece with its kick-off meeting already scheduled.

In addition, we have some nice publication highlights and newly available research positions. All worth spending the next few minutes on.

Enjoy reading!

Matthijs de Winter Editor-in-Chief, *InterPore News*

Content

-  [InterPore2020: Update on the coronavirus](#)
-  [Spanish Chapter Kick-off report](#)
-  [The Hellenic National Chapter of InterPore Kick-off meeting](#)
-  [InterPore Benelux Chapter Handbook](#)
-  [InterPore In Journals](#)
-  [Mineral Fabric as a Hidden Variable in Fracture Formation in Layered Media](#)
-  [Compressible-Gas Invasion into Liquid-Saturated Porous Media: Application to Polymer-Electrolyte-Membrane Electrolyzers](#)
-  [Research Positions](#)
-  [InterPore Calendar](#)
-  [Imprint](#)





InterPore2020: Update on the coronavirus

As the rest of the world begins to grapple with the novel coronavirus outbreak, the health and safety of InterPore2020 participants continues to be our number one priority. We are continuing to monitor the situation in Qingdao and are pleased to see an encouraging trend in China. Since the outbreak, the Chinese government has taken strict prevention and control measures to effectively curb the spread of the disease. At present, the epidemic control situation across the country shows a positive trend, with the number of confirmed new cases decreasing nationwide. For several consecutive days, the number of confirmed new cases in Shandong Province, where Qingdao is located, has been 0 (from the official website of Health Commission of Shandong Province). At the same time, in order to ensure economic and social development, all regions are carrying out the resumption of work and production in an orderly way, and daily work and life are gradually returning on track. In addition, emerging coronavirus pneumonia outbreaks are listed by World Health Organization (WHO) as a public health emergency of international concern (PHEIC). You can check the situation of your country and region in real time through the [WHO website](#).

While we understand there is a feeling of uncertainty for what lies ahead, InterPore is continuing its preparation for the rescheduled annual conference, to be held **31 August - 03 September**. We're happy with the decline of confirmed cases in China and will continue to closely monitor the situation throughout the world. We are optimistic that we will be able to welcome you to an interesting, enjoyable and safe conference later this year.

The InterPore Team

Spanish Chapter Kick-off report

The Kick-off Meeting of the Spanish InterPore Chapter was held at the Institute of Environmental Assessment and Water Research (IDAEA-CSIC) in Barcelona on January 28, 2020. The list of participants comprises 30 researchers from academia and industry. The meeting was sponsored by



the IDAEA, and through the Severo-Ochoa program of excellence.

The meeting established the Spanish InterPore Chapter as a platform for interdisciplinary porous media research, and exchange between academia and industry in Spain. A scientific meeting consisting of 4 different sessions preceded the round table discussion and formation of the steering committee. The meeting was opened by the director of IDAEA-CSIC, Teresa Moreno. After this, Marco Dentz (IDAEA-CSIC) gave a short introduction on the steps leading up to this meeting, before

Michel Quintard (IMFT Toulouse, InterPore) gave a presentation on the InterPore Society and the role of the national chapters. The opening session was followed by a keynote lecture of Michel Quintard. The scientific program was organized in 4 blocks on (i) Hydrogeology, (ii) Geotechnics and Geoenergy, (iii) Geoenergy and Geological Storage, (iv) Industrial Porous Media, with a total of 8 talks of 30 minutes each. The detailed program can be found [here](#).

Participating institutions included: AMPHOS21, CIMNE, Institute of Environmental Assessment and Water Research, IGME, Imperial College London, Universitat de Barcelona, Universidad Carlos III de Madrid, Universidad Complutense Madrid, Universitat Politècnica de Catalunya, Universidad Politècnica de Madrid, and Universidad Politècnica de Valencia.




The meeting was concluded with a round table discussion on the future of the chapter, and the formation of the [Steering and Advisory Committees](#).

The Hellenic National Chapter of InterPore Kick-off meeting

A national chapter of InterPore has been newly founded in Greece: the Hellenic National InterPore Chapter (HNIC). Details and committee members related to the formation can be found in [this document](#).

Hellas (Greece) is home to a significant number of scientists and engineers who are active in the research and study of porous media systems either from the perspective of material structure or from the perspective of physical/chemical processes taking place in-situ.

The scope in forming the HNIC is as follows:

-  to cooperate and coordinate with other National Chapters and the InterPore parent organization towards enhancing knowledge exchange and R&D synergies;
-  to interact with industry on a local and international basis;
-  to attract young researchers from local academic and research institutions as well as scientists and engineers from the domestic and international industry.

The **HNIC Kick-off Meeting** has already been planned for **14-16 May 2020** at the [NCSR Demokritos](#).

The HNIC Kick-off Meeting is held as a parallel event by the 8th Panhellenic Symposium of Porous Materials. An impression of the PSPM can be found [here](#).

InterPore Benelux Chapter Handbook

The Steering Committee of the InterPore Benelux chapter is proud to present the first version of the "Handbook of Fluid-Porous Media Interactions." The project's target is to facilitate and inspire collaborations between the different groups within their chapter. The handbook is considered a living document, which periodically will be updated with new information and with new research groups. Therefore, you are warmly recommended to share your opinions, suggestions, and your new contributions.

The handbook can be found [here](#).

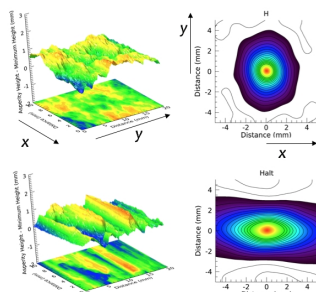
We encourage other chapters to create similar documents. Contact your National Chapter Steering Committee to get involved!



INTERPORE In Journals

Mineral Fabric as a Hidden Variable in Fracture Formation in Layered Media

Liyang Jiang, Hongkyu Yoon, Antonio Bobet, and Laura J. Pyrak-Nolte



Two longstanding goals in subsurface science are to induce fractures with a desired geometry and to adaptively control the interstitial geometry of existing fractures in response to changing subsurface conditions. Here, we demonstrate that microscopic mineral fabric and structure interact with macroscopic strain fields to generate emergent meso-scale geometries of induced fractures. These geometries define preferential directions of flow. Using additively manufactured rock, we demonstrate that highly conductive flow paths can be formed in tensile fractures by creating corrugated surfaces. Generation, suppression and enhancement of corrugations depend on the relative orientation between mineral fabric and

layering. These insights into the role of micro-scale structure on macro-scale flow provide a new method for designing subsurface strategies to maximize potential production or to inhibit flow.

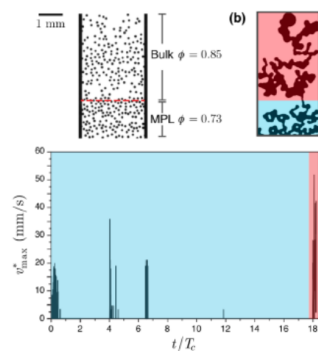
Published in Scientific Reports.

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Compressible-Gas Invasion into Liquid-Saturated Porous Media: Application to Polymer-Electrolyte-Membrane Electrolyzers

Chunghyuk Lee, Benzhong Zhao, Rami Abouatallah, Rainey Wang, and Aimy Bazylak



Understanding gas transport in liquid saturated porous media is crucial for reducing mass transport related inefficiencies in polymer electrolyte-membrane (PEM) electrolyzers. While incompressible fluid-fluid displacement in porous media has been studied extensively, transport behavior with high compressibility effects remains poorly understood. Here, we investigate the impact of compressibility on gas transport in porous media via experiments in patterned micromodels. Macroscopically, we find that the displacement pattern follows the classical transition from capillary to viscous fingering as capillary number increases, despite the compressed state of the injected gas. Microscopically (i.e., pore scale), we find that the displacement occurs via discrete bursts in the form of Haines jumps. We demonstrate that in the presence of compressibility, the pore throat size exerts fundamental control over

the burst velocity. Furthermore, we show that the inclusion of a thin, low-porosity region with small pore throats at the inlet of the micromodel increases the burst velocity of gas into the bulk of the micromodel, leading to significantly reduced gas saturation in the bulk. Our work provides a mechanistic explanation of the previously reported performance improvement due to the addition of microporous layers in PEM electrolyzers.

Published in *Physical Rev. Applied*



Corresponding author: Aimy Bazylak

InterPore Members, do you want to promote your publication to the community? If so, please submit your highlight to newsletter@InterPore.org. Note that we will not review the entries nor does InterPore endorse the published work. Furthermore, we publish on a “submitted first, published first” basis. The highlighted publication should be no older than 6 months (available online).

The highlight should be short and contain an illustration. Please note that we offer this opportunity exclusively to InterPore members. If you would like to become a member, please have a look [here](#).



RESEARCH Positions

-  PhD position in modeling of the behavior of a fractured porous medium submitted to gas pressurization, Ecole des Ponts ParisTech, Paris, France
-  PhD position in THM modeling of claystone from the molecular scale, Ecole des Ponts ParisTech, Paris, France



INTERPORE Calendar

Date	Event
14-16 May 2020	The Hellenic National InterPore Chapter meeting.
30 August - 4 September 2020	The 12th annual InterPore meeting (Qingdao, China)
1-2 October 2020	The German Chapter meeting (Stuttgart, Germany)
26-28 October 2020	The French Chapter meeting (Strasbourg, France) (Flyer)
2 November 2020	The Benelux Chapter meeting (Enschede, The Netherlands)
23-25 November 2020	The Australian Chapter meeting (Perth, Australia)
31 May - 3 June 2021	The 13th annual InterPore meeting (Edinburgh, UK)
15-21 May 2022	The 14th annual InterPore meeting (USA)



Imprint

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Articles and news items on the study and characterization of porous media,
especially when relevant to other types of porous media,
are welcomed for publication in this newsletter, issued twice a month.

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