

Digital Rock Petrophysics Industrial Affiliates Program (DRP IAP)

Center for Subsurface Engineering and the Environment (CSEE)

The University of Texas at Austin

Annual Review and Tutorials November 2021: AGENDA

PI Maša Prodanović, masha@utexas.edu

We appreciate your understanding in accommodating different time zones and the virtual meeting in “slow motion”. The times are stated in 24-hour format.

Session	Time in Austin	Time in Rio	Time in Tokyo
Research review RR1 (details below)	7-8:30, Tue, Nov 9	10-11:30, Tue, Nov 9	22-23:30, Tue, Nov 9
Research review RR2 (details below)	17:00-18:30, Wed, Nov 10	20:00-21:30, Wed, Nov 10	8:00-9:30, Thu, Nov 11
Tutorial T1 (details below)	7:00-10:00, Tue, Nov 16	10:00-13:00, Tue, Nov 16	22:00, Tue, Nov 16 -1:00 on 17th
Tutorial T2 (details below)	17:00-20:00, Wed, Nov 17	20:00-23:00, Wed, Nov 17	8:00-11:00, Thu, Nov 18

Research Review sessions: Approx. 15-min talks followed by 5-min discussion

RR1, Nov 9, 2021

1. **Prof. Maša Prodanović:** Welcome (10 min)
2. **Prof. Maša Prodanović:** Digital Rocks Portal Updates
3. **Javier Estrada Santos:** Hierarchical multi-scale convolutional neural network for efficient processing of big volumetric tensors
4. **Bernard Chang:** Improving Prediction of Electrical Properties in Heterogeneous Porous Media
5. **Alex Gigliotti:** Two-Phase Flow in Texturally Equilibrated Porous Media
6. Open Discussion

RR2, Nov 10 (or Nov 11 depending on time zone), 2021

7. **Dr. Chris Landry:** Process-based modeling workflow of carbonate-rich mudrocks
8. **Anu Radhakrishnan:** Experimental measurement of foam rheology in rough fractures

9. **Dr. Chris Landry:** Permeability study of rough and partially cemented fractures
10. **Dr. Pallabi Samaddar:** Comprehensive analysis of dynamic gas surface sorption in mesoporous silica
11. (Maybe) Wenhui Song: Stress sensitivity of relative permeability in microfractures

Tutorials: Approx 2.5-3 hours with breaks

T1, Nov 16, 2021

“Deep learning for flow prediction in heterogeneous porous media”, Javier Santos, Bernard Chang & Prof. Maša Prodanović

Join us for the tutorial [on the latest deep learning paper](#) for predicting transport properties in porous media using convolutional neural networks. This is a hands-on expansion on presentations by Prodanovic, Santos and Chang in RR1. We will include a brief introduction to the deep learning terminology.

We will work in [Google Colab](#) (web-browser-based Python environment) and all of the code/data required for the workshop will be distributed this way); all you need for registering for Google Colab is a [Gmail](#) address.

T2, Nov 17 (or Nov 18 depending on the time zone)

“Introduction to grayscale image processing and segmentation for quantification of SEM images of unconventional and related modeling”, Dr. Chris Landry & Prof. Maša Prodanović

Join us for a hands-on session expanding on the presentation by Dr. Landry in RR2. We will include a review session on characterization and modeling approaches.

Data and all code will be provided for all exercises, however you are expected to have access to the computing environment MATLAB and its image processing toolbox. Basic familiarity with the MATLAB programming environment should be enough, as we will walk you through all of the steps. If you do not have access to it, please download a 30-day trial license from [MathWorks website](#).