Workshop:

Exploring Dynamic Properties of Earth and Planetary materials Using Neutrons and X-Ray Methods

May 21-23, 2024, in Grenoble

The integration of beamline technologies and rock deformation experiments can facilitate the investigation of the feedback between evolving mechanical properties, deformation textures, and deformation mechanisms, leading to much more robust extrapolation of lab-based rheological models to Earth and other planets.
The NSF-funded Research Coordination Network (RCN) "In Situ Studies of Rock Deformation" (ISRD) aims at developing novel methods that exploit the beamline capabilities, enabling the next generation of rock deformation experiments, wherein samples can be examined while they are deforming.

The 4th ISRD-RCN workshop, hosted by the Institut Laue Langevin (ILL) and the University of Grenoble Alpes will take place *in-person* at ILL/ESRF campus on **May 21-23, 2024**. This workshop will focus on neutron and X-ray scattering and imaging as well as their applications in studying the dynamic properties of earth and planetary materials.

The **registration is open and completely free**, as it is supported by the sponsors of the program. You can register **before April the 15th** at this link https://workshops.ill.fr/event/432/.

We expect additional presentations on measurement needs from participants and emerging techniques. Participants will also visit ESRF and ILL to discuss with beamline scientists and other participants about potential beamline experiments. All participants will be partially supported to attend the workshop, the level of support will depend on fund availability.

Program:

Time	Activity	Presenter(s)
Tuesday 21st May:		
08:30 – 09:00	Arrival, registration	
09:00 – 09:30	Introduction	
09:30 – 10:30	Fluid flow in rocks in 4D: from images to processes	**Francois Renard,** University of Oslo & University Grenoble Alpes
10:30 – 11:00	Coffee	
11:00 – 12:00	4D synchrotron microtomography with Heitt Mjolnir for the in situ study of reacting and deforming rocks	**Damien Freitas,** University of Manchester
12:00 – 13:30	Lunch	
13:30 – 14:30	Advanced image analysis to elucidate coupled problems in porous media	**Peter Moonen**, Université de Pau et des Pays de l'Adour (UPPA)
14:30 – 15:30	In-situ rock deformation experiments in the LVP at P61B, PETRA III (DESY)	**Robert Farla**, DESI (Deutsches Elektronen-Synchrotron)
15:30 – 16:00	Coffee	
16:00 – 16:30	Poster talks	
16:30 – 18:00:	Posters, part 1	
19:00 – onwards	Dinner	
Wednesday 22nd May:		
08:30 – 09:30	Neutron, X-ray and SEM imaging of complex fluid movement through rock	**Helen Lewis,** Heriot-Watt University
09:30 – 10:30	Probing fluid behavior in rock nanopores under dynamic pressure conditions using small-angle neutron scattering	**Chelsea Wren Neil,** Los Alamos National Laboratory
10:30 – 11:00	Coffee	
11:00 – 12:00	Neutron diffraction experiments under high-pressure and high-temperature conditions at J-PARC: hydrogenation of iron and its implications for density deficits in the Earth's core	**Hiroyuki Kagi,** University of Tokyo
12:00 – 13:30	Lunch	
13:30 – 17:00	ESRF / ILL tours	
17:00 – 18:30	Posters, part 2	
19:00 – onwards	Banquet	
Thursday 23rd May:		
08:30 – 09:30	Multiscale observations of deformation in porous rocks based on full field measurements	**Pierre Besuelle,** Université Grenoble Alpes
09:30 – 10:30	SPAM: Open-source software for studying volume deformations and correlations for mechanics applications around X-ray and Neutron tomography	**Olga Stamati,** Université Grenoble Alpes
10:30 – 11:00	Coffee	
11:00 – 12:00	Simultaneous neutron and X-ray tomography at NeXT-Grenoble to explore coupled processes in porous media	**Alessandro Tengattini,** Université Grenoble Alpes, Institut Laue-Langevin
12:00 – onwards	Lunch/depart	

Workshop Organizing CommitteeISRD-RCN

Alessandro Tengattini, Chair
Daniel Hussey, Co-Chair,
Wenlu Zhu, Co-Chair,
Bratislav Lukic, Co-Chair