

Exploring Dynamic Properties of Earth and Planetary Materials Using Neutron and X-Ray Methods

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” (ISRDCN) 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 ISRDCN-RCN workshop, hosted by *the Institut Laue Langevin (ILL)* and *the University of Grenoble Alpes* will take place in-person at [ILL/ESRF campus](https://www.esrf.eu/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 list of speakers includes:

Damien Freitas (*University of Manchester*): “4D Synchrotron triaxial apparatus at TOMCAT”
Olga Stamati (*ESRF*): “SPAM: a software tool for studying volume deformations and correlations”
Robert Farla (*DESY*): “PETRA III and the bespoke large volume press”
Helen Lewis (*Heriot-Watt University*): “Neutron and X-ray studies of fluid flow in reservoirs”
Peter Moonen (*University of Pau*): “Geological H-storage, a multidisciplinary study”
Francois Renard (*ESRF/University of Oslo*): “Fluid flow in rocks in 4D: from images to processes”
Chelsea Neil (*Los Alamos National Lab*): “Porosity studies of shale gas recovery and H₂ storage”
Hiroyuki Kagi (*University of Tokyo*): “High pressure geoscience enabled by PLANET”
Pierre Bésuelle, (*UGA*), “Failure prediction, strain localization from full field analyses”
Alessandro Tengattini, (*UGA/ILL*), “Geomechanical studies enabled by NeXT-Grenoble”

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.

Please mark your calendar. We will put up the workshop registration page shortly on the ISRDCN website (<https://www.isrdcn.org>).

Alessandro Tengattini, Chair, ISRDCN-RCN NeXT Workshop Organizing Committee
Daniel Hussey, Co-Chair, ISRDCN-RCN NeXT Workshop Organizing Committee
Wenlu Zhu, Co-Chair, ISRDCN-RCN NeXT Workshop Organizing Committee