

The use of Neutrons and Photons in Earth Sciences

A Workshop held at the Department of Earth Sciences, Uppsala University

9.00 – 17.00, Tuesday May 8, 2018

Venue:

Norrland I (Gm118)
Department of Earth Sciences, Geocentrum
Villavägen 16
752 36 Uppsala

The purpose of the workshop is to convey the research potential of neutrons (spallation sources) and photons (synchrotron radiation) to geoscientists at Uppsala University. This potential is largely underexploited at the department today and, considering current developments especially at the Swedish National Synchrotron Laboratory (MAX IV) and the upcoming European Spallation Source (ESS), we would like to increase our readiness, and illustrate the capabilities of these facilities. The target audience consists mainly in PhD students and researchers from the Department of Earth Sciences at Uppsala University (Geocentrum). We expect about 25 participants across fields of mineralogy & petrology, geophysics, paleo-biology, hydrology, meteorology, glaciology, and physical geography. If possibility arises we will expand the workshop to include participants in other departments at Uppsala University, and regionally.

An effective way to accomplish the workshop goals is to present case studies across diverse fields (e.g. environmental sciences, geology, geophysics, climate research) where application of synchrotron and neutron radiation generate data that are required to answer research questions. The chosen examples exemplifies the spectrum of techniques applied at the large-scale facilities (diffraction, scattering, imaging, spectroscopy), presented by world-leading scientists in their respective fields. There will also be a possibility to interact directly with the workshop presenters through open discussions and question periods. The goal is to increase awareness of the workshop participants in the applications of neutrons and photons in geosciences, so that they can apply these techniques to their own research questions.

The workshop is open for 25 participants, and feel free to **register by contacting Bjarne Almqvist (bjarne.almqvist@geo.uu.se) or Peter Lazor (peter.lazor@geo.uu.se), no later than April 20**. There is no registration fee for the workshop, and lunch is included in the participation if you have previously registered.

The workshop is sponsored by the Centre for Neutron Scattering (<http://www.neutronscattering.uu.se/>) and the Centre for Photon Science (<http://www.photonscience.uu.se/>).

Invited speakers:

Dr. Lawrence Anovitz – Oak Ridge National Laboratory

Dr. Stephen Hall – Lund University

Prof. Martin King – Royal Holloway, University of London

Dr. Zuzana Konopkova - European X-Ray Free-Electron Laser Facility, Hamburg

Prof. Ingmar Persson - Swedish University of Agricultural Sciences

Dr. Guoyin Shen - Carnegie Institution of Washington

Program schedule

8.30 – 9.00 Meeting at the entrance to Department of Earth Sciences. Coffee and tea

9.00 Workshop starts – Brief introduction and welcome by the workshop organizers and by representatives from the centres of Neutron Scattering and Photon Science.

9.20 Dr. Stephen Hall – Lund University: *Investigating the Mechanics and Hydro-mechanics of Geomaterials with X-rays and Neutrons*

10.00 Dr. Lawrence Anovitz – Oak Ridge National Laboratory: *Characterization and Analysis of Porosity and Pore Structures using Scattering Techniques (preliminary title).*

10.40 coffee break

11.00 Prof. Martin King (Royal Holloway, University of London): *The oxidation of Organic Matter in the Atmosphere: Studying Reactions at Air-Water-Mineral Interfaces that may Effect Modern Climate Change*

11.40 Open discussion and question period

12.30 Lunch

14.00 Prof. Ingmar Persson - Swedish University of Agricultural Sciences, Uppsala: *What can MAX IV do for Geo and Soil Sciences, and some examples of this*

14.40 Dr. Guoyin Shen - Carnegie Institution of Washington: *Synchrotron X-rays: a Key to Probing Earth's and Planetary Interiors*

15.20 Coffee break

15.40 Dr. Zuzana Konopkova - European X-Ray Free-Electron Laser Facility, Hamburg: *Studying Deep Planetary Interiors using Synchrotron Radiation and Free Electron Laser Techniques*

16.20 Panel discussion

17.00-18.30 Poster session with snacks and beverages

19.00 Dinner downtown. Please contact us if you are interested to join. The dinner is not included in the registration, but you are welcome to you join!