

LIAG seminar, Spring 2021

Lecture series with discussion

The presentations take place every two weeks, on Tuesdays at 10 a.m. and consist of a 30-minute lecture followed by a discussion (max. one hour in total). The presentations are held in German or in English.

Participation online via Webex or Skype on the LIAG website. Please write an email to presse@leibniz-liag.de

February 16 **Luminescence and ESR dating of active faults**

Sumiko Tsukamoto

Presentation about how these dating methods are used to date active faults directly and indirectly, by showing examples from Japan and Dinarides. Intention is to let you think what other geophysical tools we have would further help, in line of the new research concept that LIAG is developing. *(Englisch)*

March 2 **Anisotropic properties of rocks**

Matthias Halisch und Christian Zeeden

Anisotropic properties of rocks are relevant for geoscience and geophysics from macro- (landscape) to microscopic (grain/pore) scales. Here the scientists present possibilities of an enhanced investigative workflow for the anisotropy of rock samples in the LIAG laboratories, namely joint interpretation of the anisotropy of the magnetic susceptibility (AMS) and μ -CT based image data and analysis. We place the value of such data in the context of geophysical research, and give an example of a latest in-house project.

March 16 **custEM 1.0 – An open-source tool for arbitrary 3D electromagnetic modeling**

Raphael Rochlitz

After five years of development, custEM has become a tool for arbitrary 3D geoelectromagnetic simulations. The presentation gives insights about the fields of application and the value of open-source developments for cooperation.

March 30 **ESR dating of sediments from archaeological sites in Zambia**

Marcus Richter & Sumiko Tsukamoto

The talk will be about how ESR dating is used to date stone tool sites that are beyond the age limit of luminescence dating techniques. We show that the combined approach of luminescence and ESR dating is a powerful tool for establishing a chronology of sites covering a wide age range in the Quaternary. *(Englisch)*

April 13 **NMR for Hydrogeophysics**

Mike Müller-Petke, Thomas Hiller, Nico Skibbe, Thomas Günther & Stephan Costabel

The presentation gives insights into the latest NMR developments and results of the two research projects COMET and MoreSpin. While COMET covers the joint inversion of NMR with ERT data for detailed investigations of groundwater systems, within the MoreSpin project a new NMR soil moisture content sensor is developed and first field data can be presented.

- April 27** **Long-term monitoring with Saltwater Monitoring System (SAMOS)**
Michael Grinat, Mathias Ronczka, Dieter Epping, Vitali Kipke & Robert Meyer
The measurements and results at the locations Borkum (CLIWAT I & II), Spiekeroog, Abickhufe and Münsterdorf are discussed.
- Mai 11** **First insights into analyses of geophysical data of Prees-2 borehole (England) as part of the ICDP JET-Project**
Katharina Leu
The objective of the JET-Project is to obtain a complete and continuous sedimentary archive of the 25 million years of the Early Jurassic. We will log analysis carried out by LIAG contributes to interpretations with respect to lithological characterization of sediments, paleoclimatic history, sedimentary facies and cycles.
- Mai 25** **Results from the DFG project 'REGROUP' (Reconstructing precipitation patterns in Europe from topsoil properties)**
Christian Zeeden
A test about if we can quantify (palaeo-)precipitation, temperature and aridity by applying room- and high-temperature rock magnetic and colorimetric data of recent topsoils in a narrow precipitation range between ~535 mm/a and 585 mm/a from the Middle Danube Basin (Serbia). Results show that we can quantify precipitation by rock magnetic properties well.
- June 8** **Applied Borehole Geophysics to detect Paleoclimate Signals in Lacustrine Deposits: An Update from the ICDP MexiDrill Project**
Mehrdad Sardar Abadi
Results from several borehole geophysics tools including gamma-ray, magnetic susceptibility, focused electric, sonic and caliper to detect and describe regular cyclic environmental processes from the potential disruption and distortion processes from a lacustrine record in tropical North America. *(Englisch)*
- June 22** **Towards extending luminescence dating using VSL and IR-RF signals**
Neda Rahimzadeh & Gwynlyn Buchanan
The main aim of the presented study is to compare the application of the novel dating methods in both quartz; VSL, and K-feldspar; IR-RF, in an attempt to extend the dating range of quartz and overcome the fading problem of the feldspar. The reliability of used methods are evaluated against the independent age framework from Luochuan (Chinese loess plateau). *(Englisch)*
- July 6** **Current standing of the Counter-IED 3 project: Ground-penetrating radar based landmine and IED detection – Experimental vs. simulated data**
Sam Stadler, Stephan Schennen & Jan Igel
The CIED3 project encompasses studies in the realm of finding buried landmines and IEDs (improvised explosive devices) with GPR. Notably, we perform measurements and numerical simulations of scenarios with different soils, GPR antennas and buried objects. The influence of the physical soil properties, soil heterogeneity, antenna height and inclination are examined.

July 20

**Shear wave seismics as a tool for localization of areas at risk of geohazards in
Schleswig-Holstein**

Rebekka Mecking

The presentation demonstrate the possibilities to derive an estimate of geohazards due to subsidence from shear-wave seismic measurements using the Quickborn region in Schleswig-Holstein as an example. A combination of reflection seismic evaluation, borehole measurements and waveform inversion will improve the understanding of subsidence processes and identify characteristic features of earthquake-prone areas.