

INVITATION TO THE PHD-COLLOQUIUM OF THE FACULTY OF GEOSCIENCE

Date: 14th December 2023 at 16:00
Room: IA 02/445
Zoom: 622 2558 7199, passcode: 325131
Moderator: Roman Fritz

16:10 to 16:30 Theresa Reinersmann

– Different nutritional controls of microbial activity in flow paths vs. matric soil

16:35 to 16:55 Maria Dias

– The experimental determination of diffusion rates in orthopyroxene and implications for diffusion chronometry

17:00 to 17:20 Ulrich Schildberg

– Mining Company Towns-Case Study Longyearbyen/Svalbard

17:25 to 17:45 Mounir Azzam

– Spatial empowerment through real estate development strategies in the context of urban renewal of devastated areas

All interested parties are kindly invited to attend in the colloquium.



Join on Zoom via the QR-Code:

LIST OF ABSTRACTS

Theresa Reinersmann

Substrate and nutrient supplies for soil microorganisms in subsoils are often linked to preferential flow pathways or root channels causing hotspots of microbial activities along these input pathways. The lack of substrate and nutrient input in the adjacent matric soil is hypothesized to limit microbial activity. Soil samples from the flow path and matric soil were amended with different treatments (based on C and N). CO₂ respiration was determined, and DNA analysis was performed to detect differences in nutritional controls between preferential flow pathways and matric soil and in the composition of the microbial community. Results show different nutrient limitations of preferential flow paths and matric soil and indicate different microbial community compositions.

Maria Dias

Diffusion modelling is a growing field in geosciences, owing to the broad spectrum of interest in petrological studies. Among other applications, it allows to determine time information in magmatic systems, such as magma mixing events, cooling rates or crystal residence times in magma chambers. To do so, it is desirable to have a comprehensive data set of experimentally determined diffusion coefficients, measured as a function of the relevant thermodynamic conditions. Both the experimental determination of diffusion coefficients, as well as the determination of time scales from diffusion modeling ("diffusion chronometry"), rely on the measurement of concentration profiles or maps in minerals with concentration gradients. Together with an appropriate diffusion model, it is then possible to determine timescales (or diffusion coefficients) by fitting modelled diffusion profiles to measured compositional gradients. The application of diffusion data for pyroxene is promising for several reasons but regardless of the numerous advantages and the wide range of applications for diffusion data in pyroxene, there is a lack of comprehensive experimental data for the relevant thermodynamic and compositional parameters. We experimentally determined the diffusion rates of Fe-Mg, Li and REE for orthopyroxene along the [001] axis as a function of T , X_{Fe} , $f\text{O}_2$ and to a certain extent, the presence of trivalent impurities in the crystal lattice over the temperature range of 950-1100 °C and $\log f\text{O}_2$ between -7 and -11 Pa.

Ulrich Schildberg

Company Towns are a special expression of industrial settlements. They are founded and managed by a company for a special purpose, e.g. mining. Mining Company Towns are bound to the site of the resource e.g. coal or iron ore. As these resources are very often situated in peripheral and uninhabited regions it is necessary to attract workers from abroad and support them with houses. Most mining Company Towns are path-dependent, as they are dependent on a special industry and so they are in a "lock in", it is hard to get out, when mining ends. The mining towns on the remote Norwegian island Spitzbergen are a good example for this.

Mounir Azzam

In a world of increasing hazards, the consequences are frustrating. Urban renewal in devastated areas is a complex process that shapes cities and determines the future. Real estate, a pillar of community stability, is vulnerable to disasters, leading to spatial disruption due to factors like land loss, societal collapse, and population changes from refugee movements. This affects property and exacerbates spatial imbalances. The lack of practical criteria for sustainable living irrespective of location is a problem. This dissertation aims to empower spatial development through real estate strategies in the context of urban renewal. It emphasizes the need to address emerging challenges in urban renewal by integrating mitigation and adaptation principles in pre- and post-disaster phases to create safer and less vulnerable societies. It includes three chapters: (1) a review of real estate challenges and innovations in devastated areas, (2) the development of a real estate valuation framework for post-disaster recovery using the Damascus metropolitan area as a case study, (3) and the exploration of real estate strategies, including CIM technology, for smart recovery, and utilization of 3D datasets representing war-related attributes to support sustainable property valuation efforts.