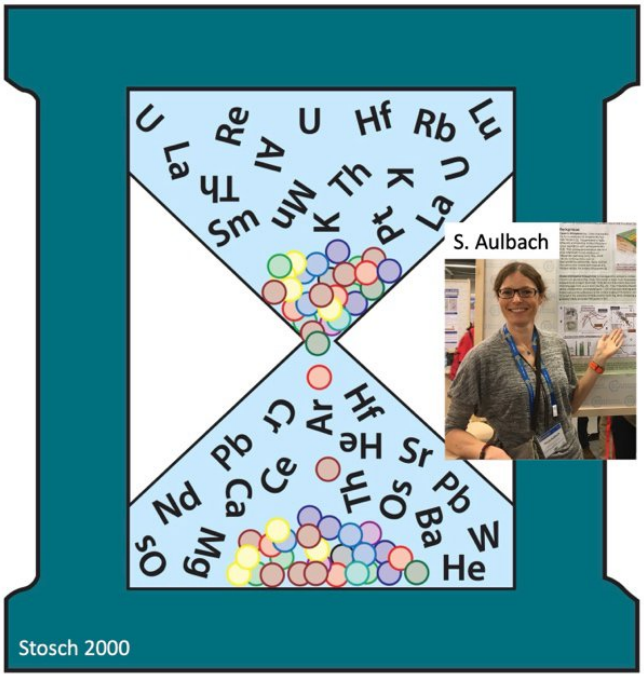
280100 VO Geological applications of radiogenic, volatile and metal stable isotopes and trace elements

3.00 ECTS Block Course April 2024

The Isotopic and Geochemical Toolbox in Geoscience



The isotopic and geochemical characterization of geological materials is a fundamental tool in Earth and Planetary Science, and a fast-moving field. Continued rapid advances in laboratory and analytical techniques have allowed to obtain elemental and isotopic information across the periodic table with ever-increasing precision and accuracy, enabling the analysis of ever-smaller sample volumes at high spatial resolution. This lecture series will recapitulate the basics of the discipline, review sample preparation and instrumentation and their limitations, and highlight the varied uses of radiogenic, volatile and metal stable isotope ratios in combination with trace elements to address specific problems in planetary evolution, geochronology, and Earth systems science with illustrations from recent case studies.

The aims of this course are to (1) familiarise students with some of the major outstanding questions regarding **solid Earth** and its interaction with the **ocean-atmosphere system** through time, and (2) raise their awareness as to the challenges, opportunities and future directions of applying **high- and low-temperature element and isotope geochemistry** to address these questions.

Sonja Aulbach is Heisenberg fellow at Goethe University Frankfurt, recipient of the 2021 Paul W. Gast Lecture and Co-Editor-in-Chief of Chemical Geology. Her main research interests are in the origin, modification and destruction of continental lithosphere in the context of the physicochemical evolution of terrestrial reservoirs, volatile cycling and geodynamics through time, which she continues to address using the geochemist's toolbox.

If interested, please sign in!

First unit: Mo 08.04. 16:00-19:00 Felix-Machatschki-Seminarraum Mineralogie 2B284 2.OG UZA II