Active and fossil magmatic-hydrothermal systems from Azores Islands to European Variscan Belt and Eastern Carpathians

Prof. Dr. Hab. Iuliu Bobos, University of Porto

This talk explores the role of active and fossil magmatic – hydrothermal systems for the economic geology. These systems are sensitive indicators of post-magmatic conditions, making them essential for reconstructing thermal history and fluid pathways with emphasizes on the understanding the chemical transfer, mineralogical reactions, recycling of chemical elements and the mineralization processes. These processes may provide challenging topics of the broad qualitative questions related to near-surface Earth processes.

Over the past decade, analytical techniques (e.g., X-ray diffraction, high-resolution transmission electron microscopy, secondary-ion mass spectroscopy, laser-ablation mass spectroscopy, etc.) have also advanced and offered a new vision for scientists in mineralogy and geochemistry, making data available with an unparalleled analytical and spatial resolution.

In this way, stable ($\delta^{18}O$, δD), light ($\delta^{7}Li$; $\delta^{11}B$), and radiogenic isotope (e.g., U-Pb) ratios are potentially powerful tracers of fluid–mineral interactions and dating, while thermo-barometer indicators based on fine mineralogical compositions are appropriate probes to reconstruct pro- and retrograde mineralogical reactions.

Presentation will cover recent advance studies obtained on the active hydrothermal system from Furnas (Azores Islands), magmatic-hydrothermal systems from the French Central and Central Iberian Massifs, and the fossil hydrothermal system from Harghita Bãi (E-Carpathians), including topics related to HFSE and REE in acid-sulfate alteration envelope, W (Sn) and Li ores, nucleation and growth of illite minerals and, organic and inorganic fluids circulation in fossil hydrothermal systems.

Suggested literature:

Bobos, I., et al. (2024) **Ore Geology Reviews, 168 (106013),** https://doi.org/10.1016/j.oregeorev.2024.106013 3

Bobos, I. (2023) **Geological Magazine 160(2) https://**doi.org/10.1017/S0016756822000851

Bobos, I. et al. (2022) **Minerals** *12*(1),24; https://doi.org/10.3390/min12010024

Bobos, I., Gomes, C. (2021) **Minerals**, 11, 335. https://doi.org/10.3390/min11040335

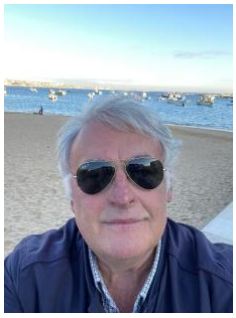
Bobos, I. (2019) **Clay Minerals**, 54, 1, 27-40, https://doi.org/10.1180/clm.2019.4

Bobos, I., Williams, L.B. (2017) **Chemical Geology,** 473, 22-38. https://doi.org/10.1016/j.chemgeo.2017.10.005

Bobos, I., Eberl, D.D (2013) **Clays and Clay Minerals,** 61, 375-391. https://doi.org/10.1346/CCMN. 2013.0610415

Bobos I. (2012) **American Mineralogist,** 97, 962-982. https://doi.org/10.2138/am.2012.3801

Bobos I. et al. (2007). **Clays and Clay Minerals**, 57, 3, 296-304. https://doi.org/10.1346/CCMN.2007.0550306



About speaker: Iuliu Bobos (Prof. Dr. Hab.), University of Porto
Chair: Crystallography and Mineralogy, Geological Resources, Biogeochemistry.
Director: PhD school (2014-2018); MsC course (2016-2020).
Research: Low-temperature mineralogy and geochemistry
Conducted: 6 PhD thesis defended and 3 post-doc in Bio-, Environmental and Experimental Geochemistry, Low-grade metamorphism, and Economic Geology (W, Sn, Li, U and Pb,Zn ores); 25 MsC. defended; 3 ongoing PhD thesis.
Editor: Discover Minerals, Springer Verlag; Minerals, MDPI Basel; Frontiers in Earth Sciences.
Professional Honors and Fellowships: NATO Fellowship; Professor Invité: Université "Louis Pasteur" Strasbourg, France; Aveiro University, Arizona State University at Tempe; U.S. Geological Survey-Denver.
Membership: Mineralogical Society; Mineralogical Society of America; Geochemical Society; Clay Minerals Society; Society of Geology Applied to Mineral Deposits.
Awards: Romanian Academy Prizes in 1999 and 2017.