Thursday 5 May 2022

Onsite: h.16 - Aula Ruffini *Dipartimento di Scienze della Terra, Torino*
Remote: via webex at this LINK

Seminars of geology

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Making sense of mineral trace-element data: Common pitfalls in statistical analysis and how to avoid them

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Over recent years, mineral trace-element compositions have become increasingly important tools in geological research. This is largely due to the advent of rapid and affordable laser ablation-ICP-MS analyses. However, while much new data is being collected and published, relatively little work has been done to develop general guidelines for the statistical treatment of mineral trace-element data. Several features of the data require careful consideration during evaluation to avoid biased results – and these are often not considered appropriately. In particular, the generally hierarchical structure of the data and its compositional nature require attention to generate meaningful and robust results. This seminar will give a general overview of the special features of mineral trace-element data and how they can be treated in statistical analyses. This will be illustrated with some relevant examples from ore geology.

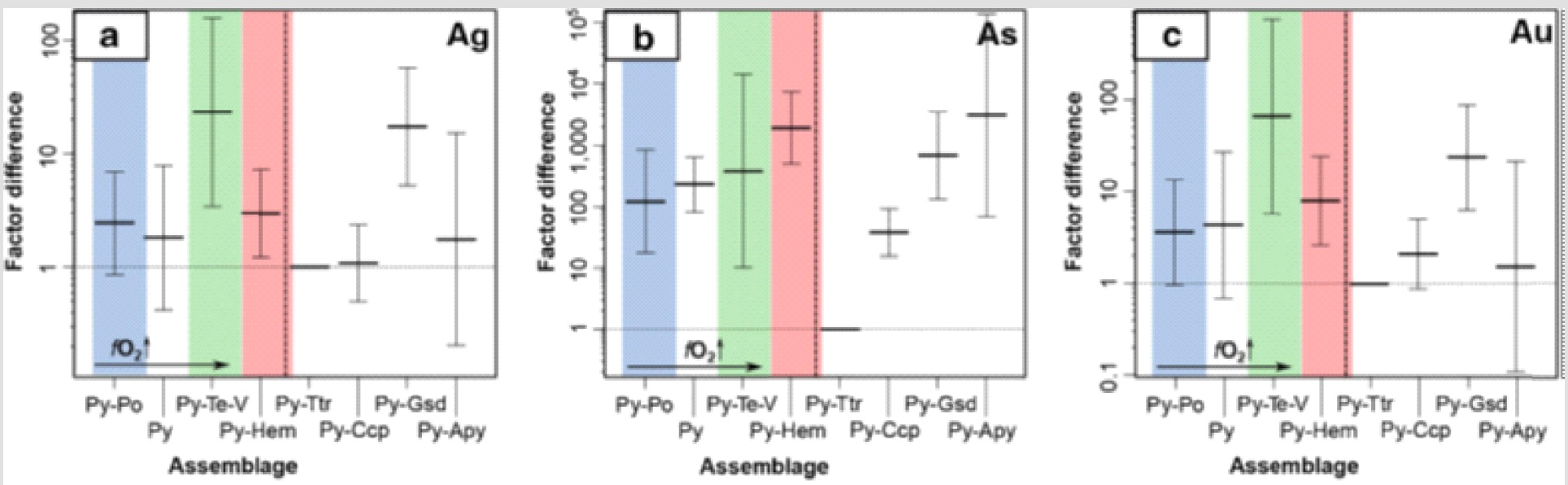

Figure: *Mean factor differences in Ag, As, and Au concentrations between pyrite samples from different mineral assemblages in the Kalgoorlie district, Western Australia, including 95% confidence intervals. The assemblage Py-Ttr is the reference assemblage, and therefore, has no associated uncertainties. Abbreviations: Py – pyrite, Po – pyrrhotite, Te – tellurides, V – vanadium, Ttr – tetraedrite, Ccp – chalcopyrite, Gsd – gersdorffite, Apy – arsenopyrite. Reproduced from Godefroy-Rodriguez et al. (2020).*

The Speaker

Max Frenzel leads the Geometallurgy and Economic Geology Group at the Helmholtz-Institute Freiberg for Resource Technology. He obtained an M.Sci. from the University of Cambridge in 2012, followed by a Ph.D. from TU Bergakademie Freiberg in 2016, and a postdoctoral position at the University of Adelaide in 2017-18. His research focusses on different aspects of the mineralogy, geochemistry, texture, and genesis of base-metal ores and how these affect mineral processing operations. He also works on the modelling of metal supply chains to better understand future availability issues.