Special Issue

AI-Based GIS for Pinpointing Mineral Deposits

Message from the Guest Editors

Dear colleagues, With a dwindling in the number of grassroots exploration opportunities, modern-day exploration campaigns are mostly focused on exploring deep-seated, blind, or even covered mineral deposits. Artificial intelligence (AI)-based techniques can help in extracting the subtle patterns in geoscientific data that are linked to the mineralization of the type being sought. In essence, two- and three-dimensional geochemical, geological, and geophysical signatures should be considered for mineral exploration. In addition, individual surveys only reveal limited information on mineralization. Developing an AI-aided 4D-geographical information system (GIS), namely a system enabling the analysis, visualization, and integration of 2D- and 3D-based big data, is required to discover deep-seated mineral deposits. This Special Issue seeks to cover this knowledge gap by collecting papers on the following topics:

- Machine- and deep-learning-based geochemical and geophysical pattern recognition for mineral exploration
- Machine- and deep-learning-based mineral prospectivity mapping (MPM)
- Novel algorithms for MPM
- Quantification of uncertainty in 2D/3D-based MPM

Guest Editors

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Deadline for manuscript submissions

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About the Journal

Message from the Editor-in-Chief

Minerals welcomes submissions that report basic and applied research in mineralogy. Research areas of traditional interest are mineral deposits, mining, mineral processing and environmental mineralogy. The journal footprint also includes novel uses of elemental and isotopic analyses of minerals for petrology, geochronology and thermochronology, thermobarometry, ore genesis and sedimentary provenance. Contributions are encouraged in emerging research areas such as applications of quantitative mineralogy to the oil and gas, manufacturing, forensic science, climate change, geohazard and health sectors.

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 18.2 days after submission; acceptance to publication is undertaken in 2.6 days (median values for papers published in this journal in the first half of 2025).

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