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Pursuing Big Science Questions with Information-rich Minerals

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Durable and information-rich, minerals offer direct, solid glimpses of eons of planetary transformation. Using important mineral and geochemical data resources such as the RRUFF Project (rruff.info), the IMA list of mineral species (rruff.info/ima), the Mineral Evolution Database (MED; rruff.info/Evolution), the Mineral Properties Database (odr.io/MPD), Mindat (mindat.org), EarthChem (earthchem.org), and the Astromaterials Data System (Astromat.org) and data "rescued" from scientific literature, provides researchers with unique data problems such as High-dimensional, Heterogeneous data or in some cases small or sparse data.

In this presentation, we explore the big science questions that can be answered using mineral and geochemical data resources. These questions show how key mineral data is to advancing our understanding of the planetary bodies in our solar system and the role our planet's geosphere played in the origin and evolution of life.

Additionally, we also highlight the data science methods, algorithmic innovations, and the socio-technical aspects of these interdisciplinary explorations.