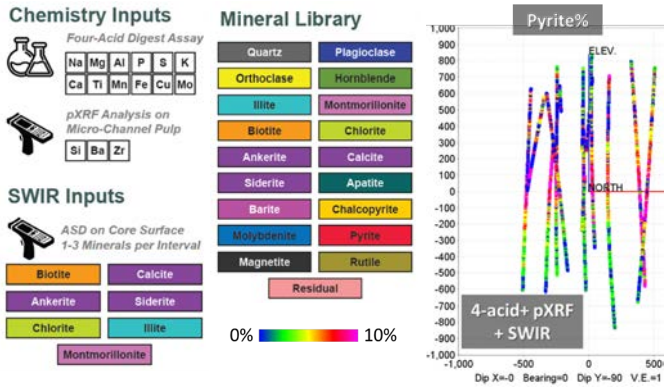
mdru Mineral Deposit Research Unit

SCIENCE. EXPLORATION. DISCOVERY.

Technology, Research and Development

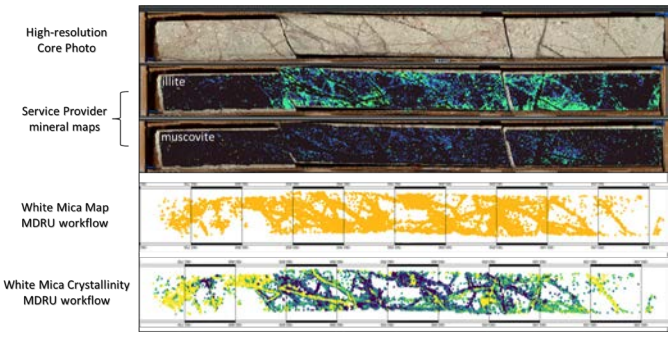
MDRU is advancing the next generation of detailed ore body models for exploration and mining by integrating emerging technologies and innovative methods to transform geoscience data into robust, holistic, and **quantified ore body knowledge.**

Dynamic Calculated Mineralogy



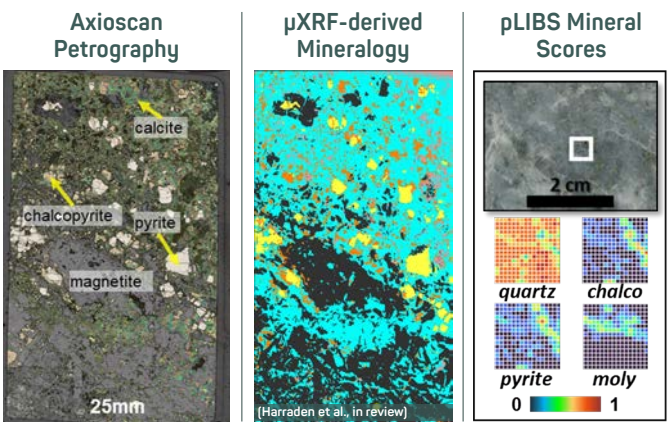
Integrating geochemical inputs, geological constraints, and spectral data with a dynamic mineral library converts multi-element chemical data into robust, domain-informed mineralogy.

Hyperspectral Cube Interpretation



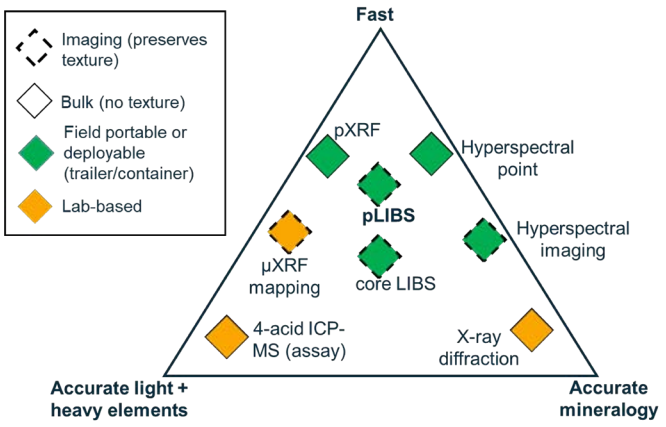
Develop open-source methods that empower users to analyze, interpret, and generate outputs tailored to evolving industry needs and research goals.

Integrating Emerging Technologies



Digital petrography (Axioscan) and mathematical approaches applied to chemical imaging (µXRF, pLIBS) enable rapid, multi-scale mineral mapping.

Ecosystem of Sensing



No single method provides a complete mineral system picture – multi-data integration is key.

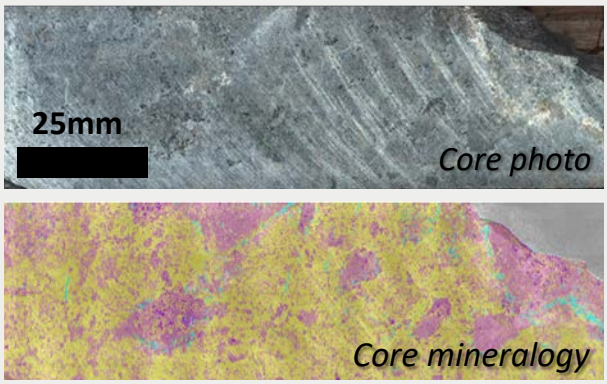
mdru Mineral Deposit Research Unit

SCIENCE. EXPLORATION. DISCOVERY.

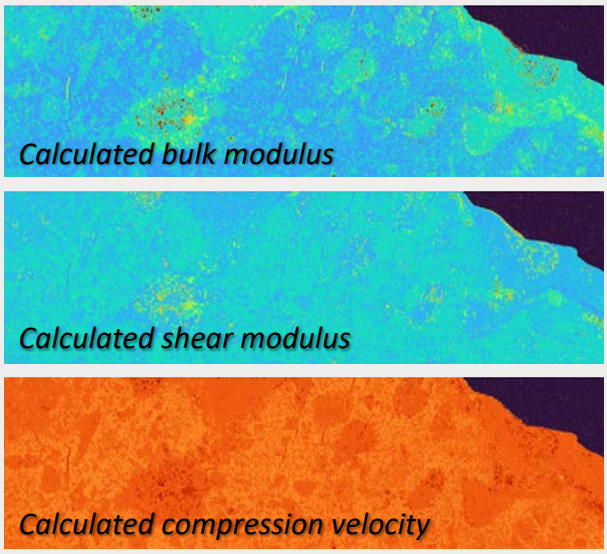
UBC

Future Project: Transforming Geoscience Data into Actionable Orebody Knowledge

From Geology...



...to Engineering Parameters



The Challenge

Despite the vast volumes of geoscience data collected, there is a **lack of effective integration** and coordination between exploration, engineering, and finance teams. Data management struggles to handle large, complex datasets, leading to information that is often **not communicated at actionable scales** or transformed into meaningful orebody knowledge.

The Opportunity

By de-siloing data and integrating diverse geoscience datasets, we can leverage emerging technologies and AI to develop innovative workflows that transform complex data into actionable orebody knowledge. Integrating high-fidelity chemical and mineralogical datasets across scales, this project will seek to quantify geological variability, enhance deposit-scale understanding, and develop quantitative predictive tools for key engineering parameters—ultimately ***unlocking new and improved mineral deposit knowledge.***

Project Objectives

- ***Integrate diverse geoscience datasets across scales*** (microns to kilometers) to develop quantitative, predictive tools for engineering parameters.
- ***Combine geological, geophysical, and geochemical data outputs*** to generate new exploration insights and innovative tools for the mining industry.
- ***Develop tools that transform integrated geoscience data into quantified, actionable orebody knowledge*** (with quantified uncertainty) at the appropriate scales, usable by geologists and engineers, through collaboration with researchers and industry experts across the mining value chain.

We Are Seeking Industry Collaborators To Help Shape The Research Scope

Interested? Please contact us for more information.

Shaun Barker: sbarker@eoas.ubc.ca · **Cassady Harraden:** charraden@eoas.ubc.ca