Energy, Structures, Metals, and Fluids: A Mineral Systems Study of Cu ± Au Mineralization in the Kiruna Mining District

Leslie Logan
Division of Geosciences and Environmental Engineering
Ore Geology

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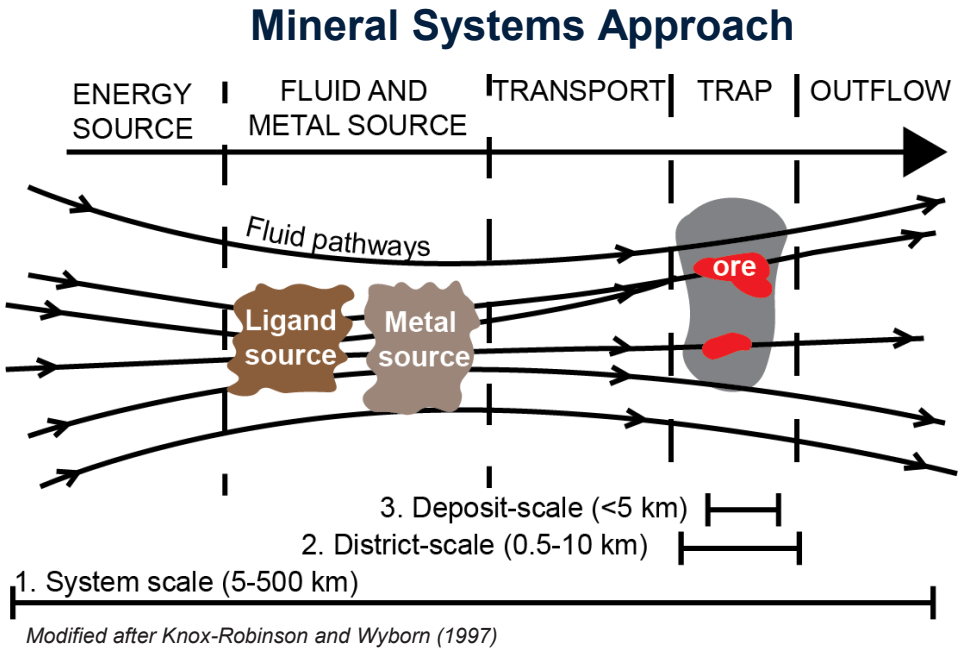
Approach to Study

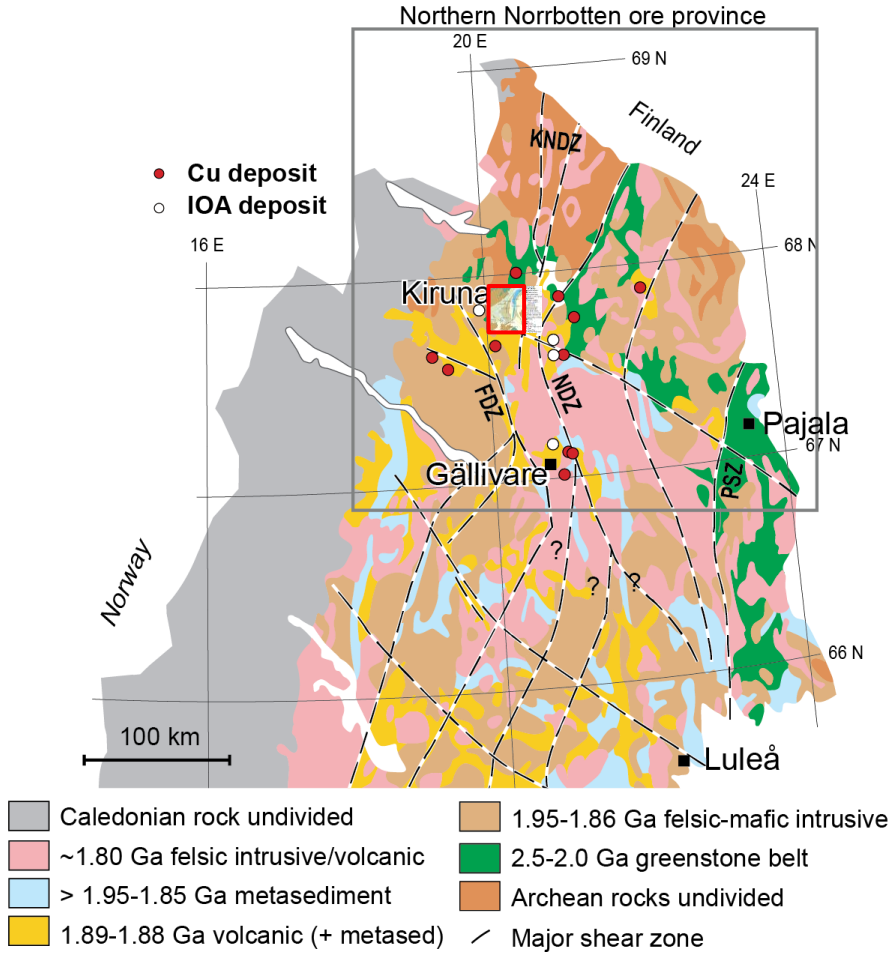


Modified after Knox-Robinson and Wyborn (1997)

Pahtohavare epigenetic Cu ± Au

Motivation

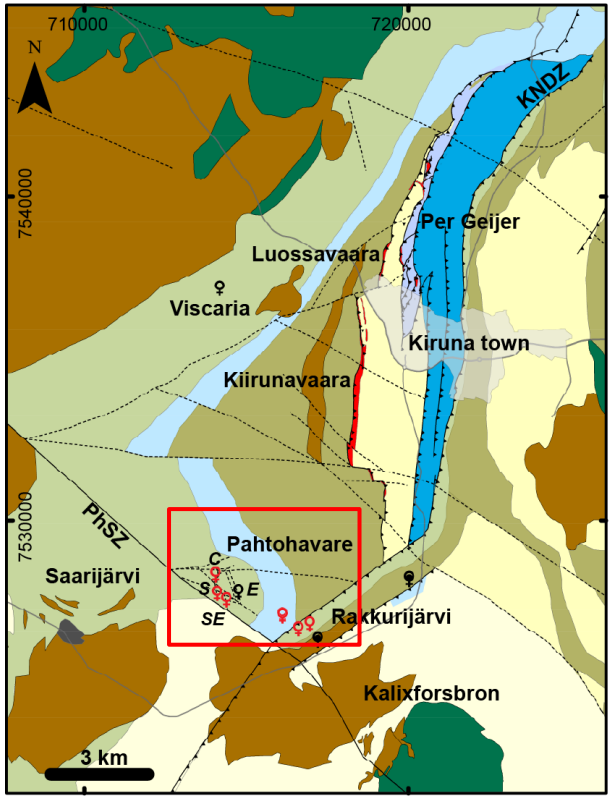
IOCG – province + IOA deposits



Modified after Weihed and Williams (2005), Bauer et al. (2021), and Bauer and Andersson (2023)

Motivation

Kiruna mining district → famous for giant Kiirunavaara IOA



Igneous rocks (~1.89-1.86 Ga)
- Granite-syenite
- Gabbro-monz.

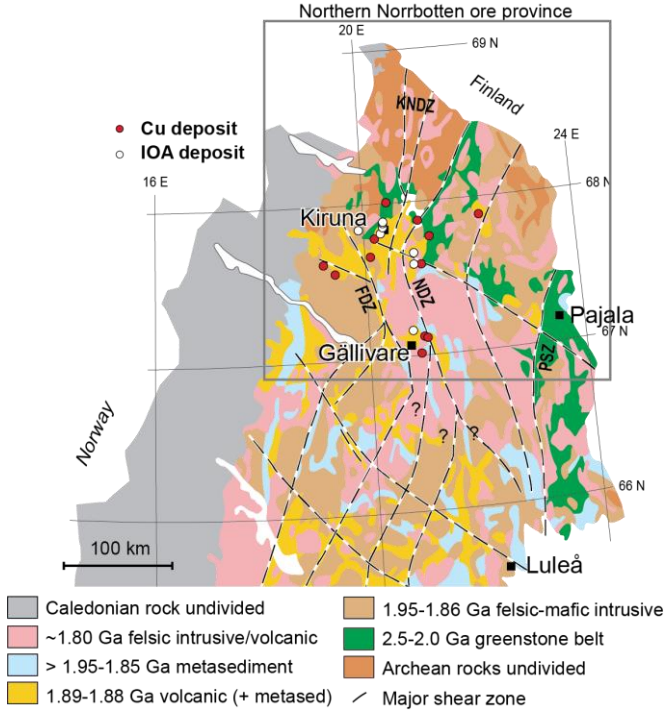
Supracrustal rocks

Orosirian (~1.89-1.85 Ga)
- Quartzite
- Basalt, rhyolite, brecc., conglom., graywacke
- Rhyodacite
- Trachyandesite
- Conglomerate
- Andesite, Basalt

Rhyacian (~2.5-2.1 Ga)
- Basalt, andesite, tuff

Archean rocks (>2.6 Ga)
- Granite

Other
- IOA ore
- Cu (Fe ± Au)
- Cu (Fe ± Zn) / Fe-ox.
- Fault
- Shear zone
- Reverse shear zone

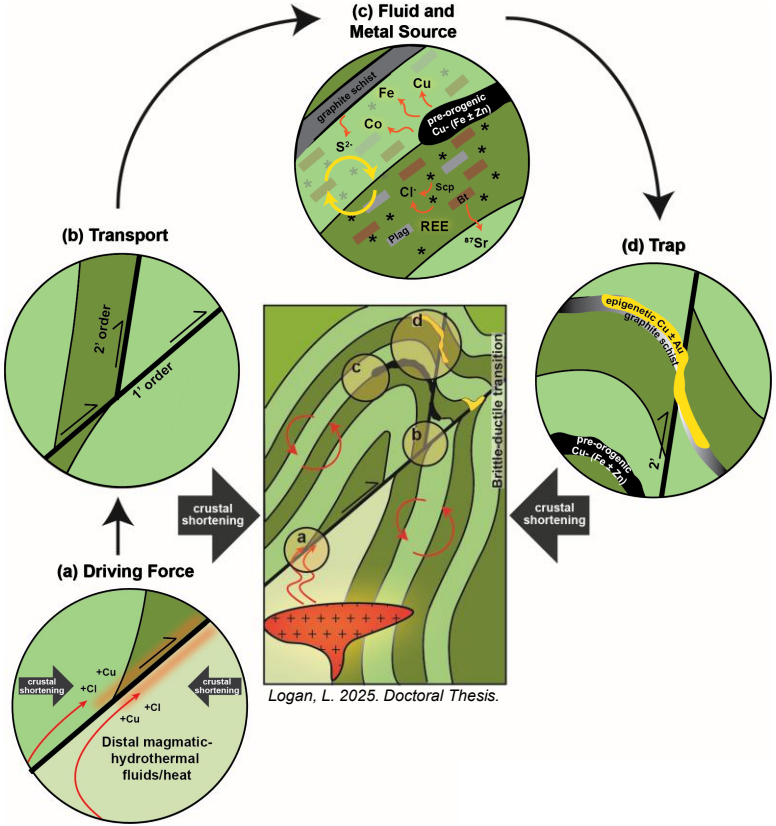


Research question:

Correlation between IOCG and IOA?

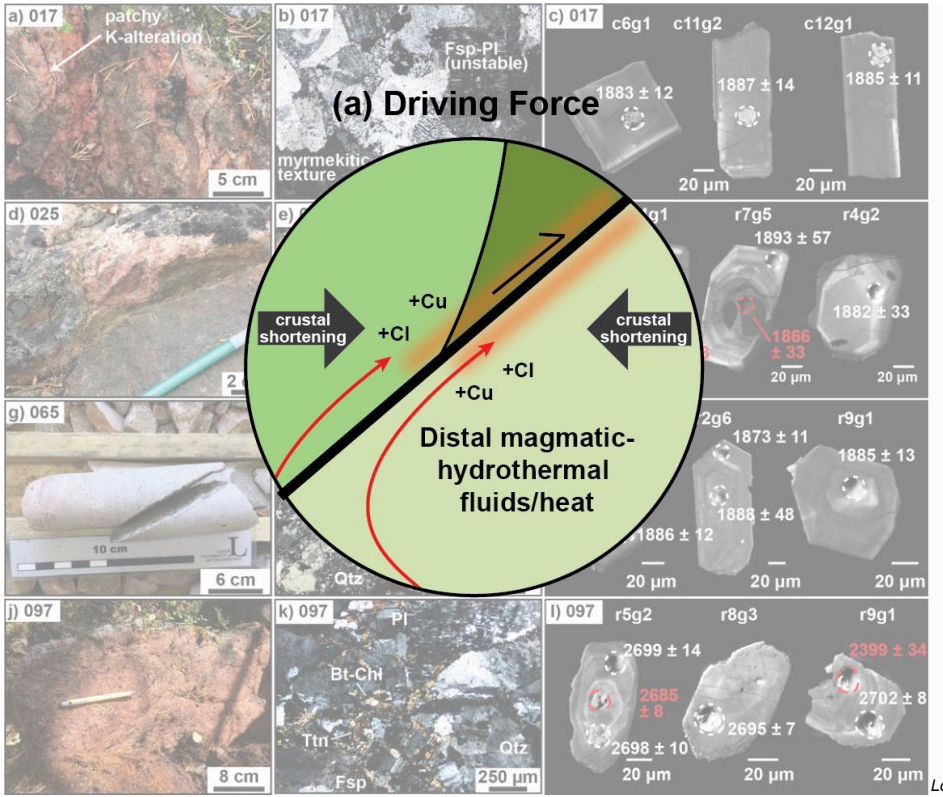
Modified after Weihed and Williams (2005), Bauer et al. (2021), and Bauer and Andersson (2023)

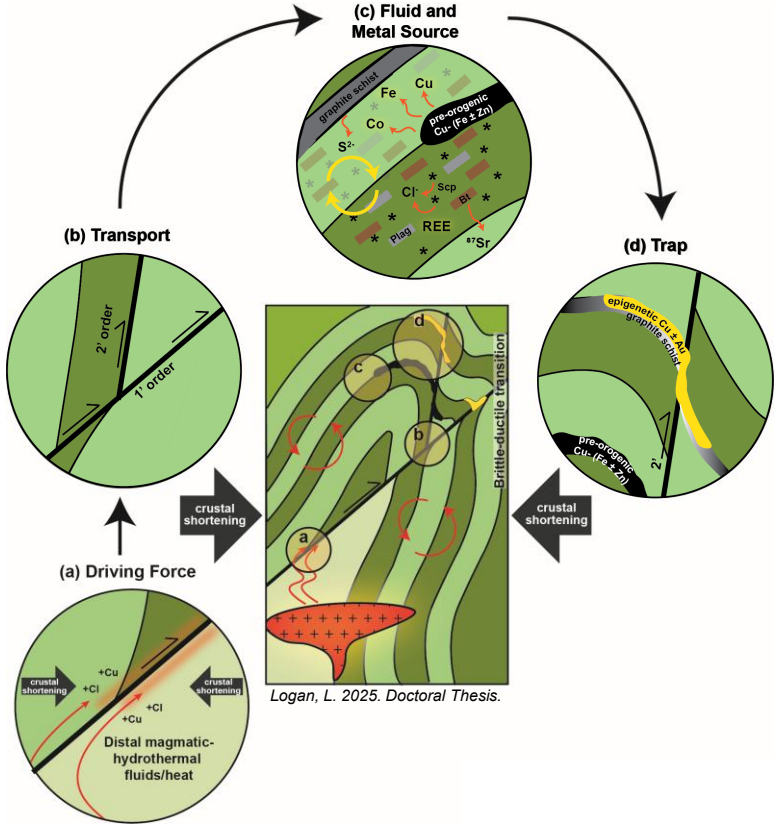
Mineral Systems Model



Logan, L. 2025. Doctoral Thesis.

Mineral Systems Model





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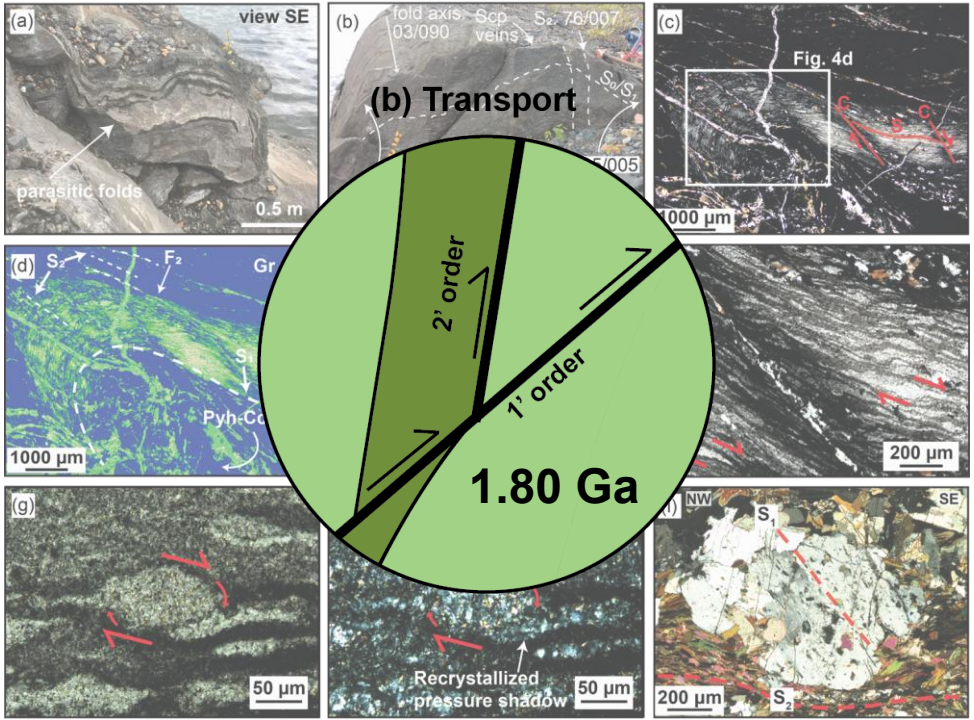
Logan et al. (2022)

Mineral Systems Model



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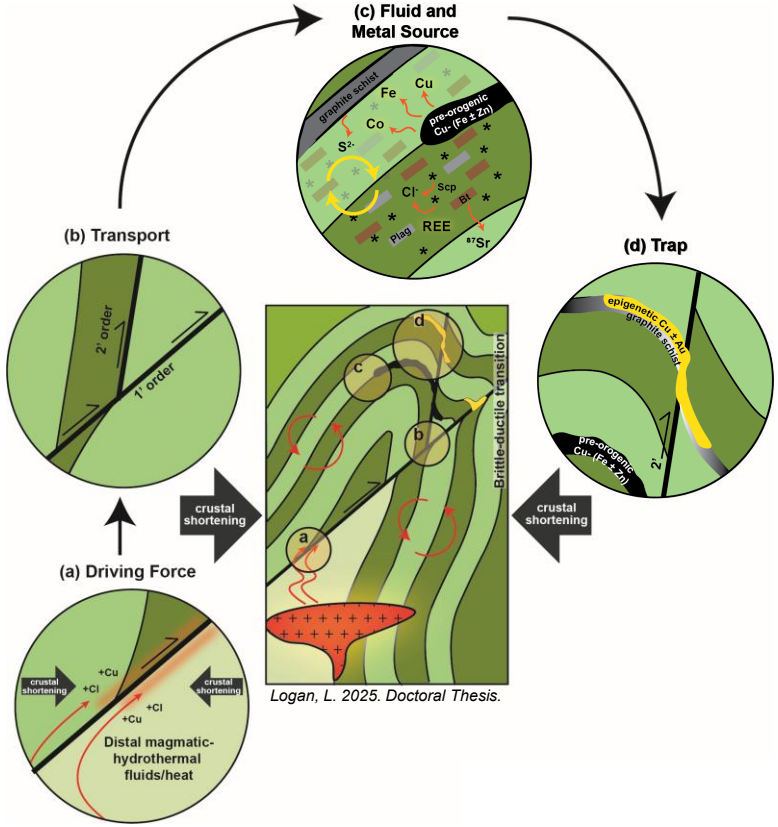

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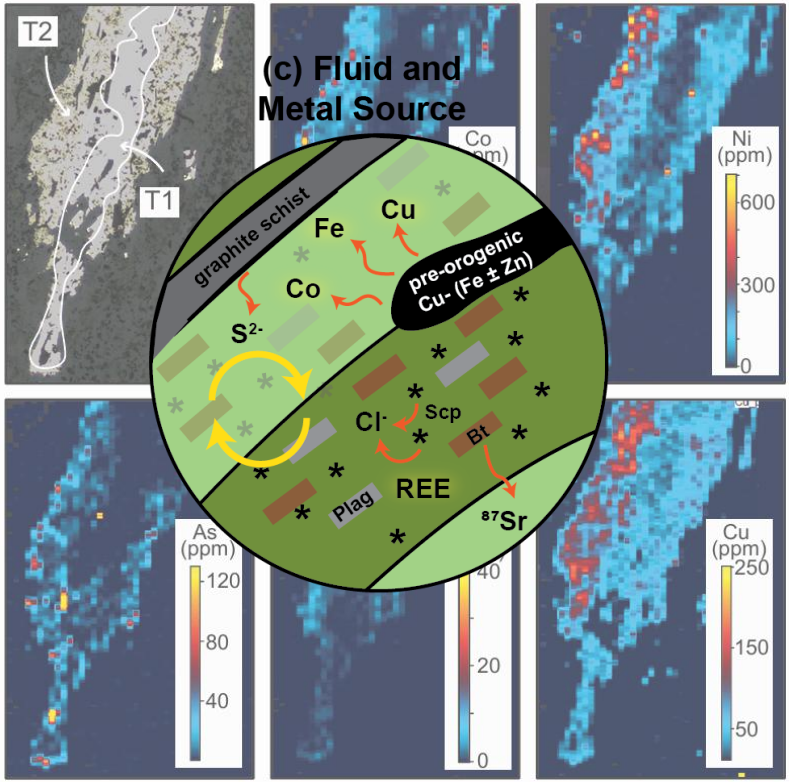

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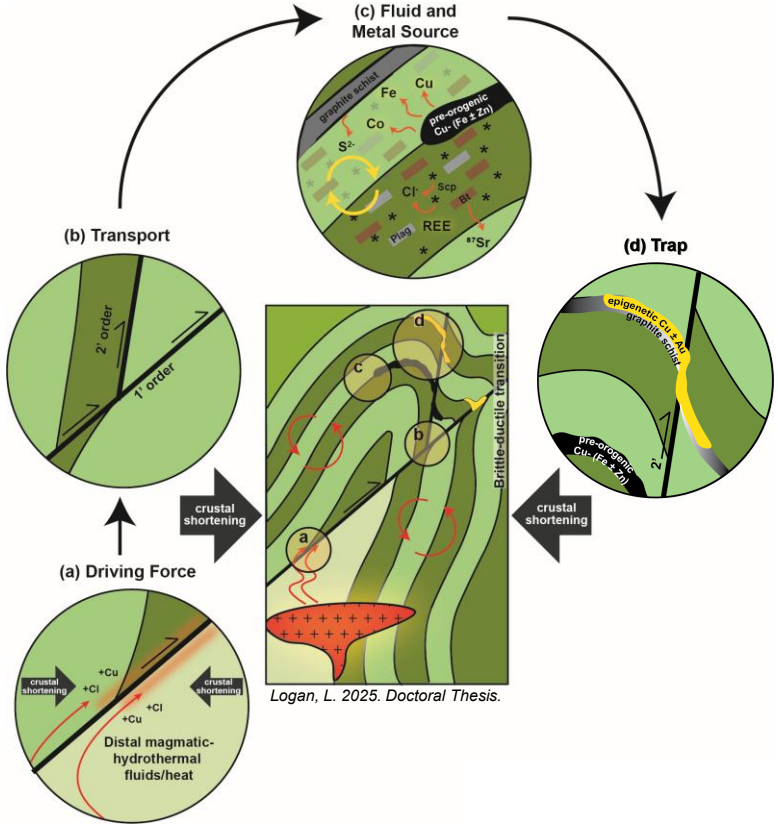

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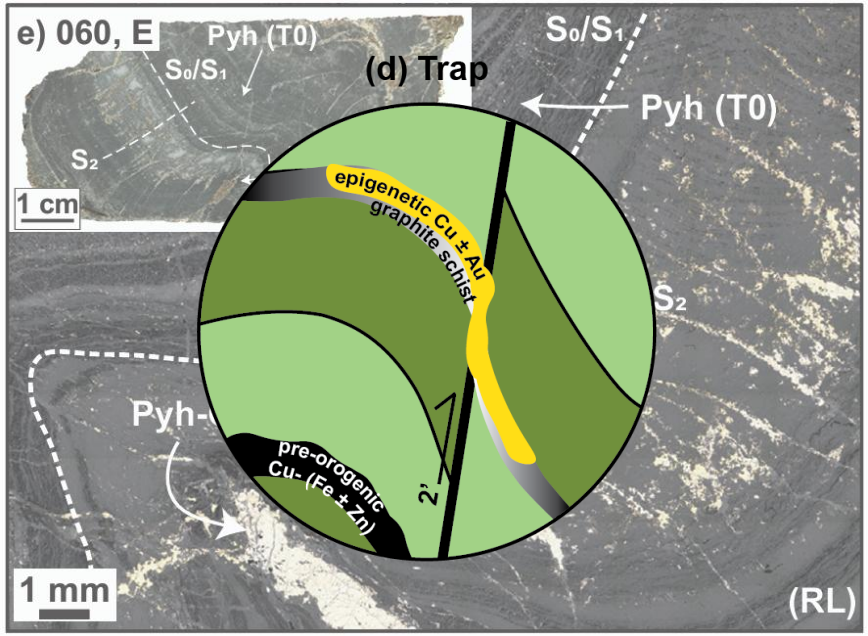
Mineral Systems Model



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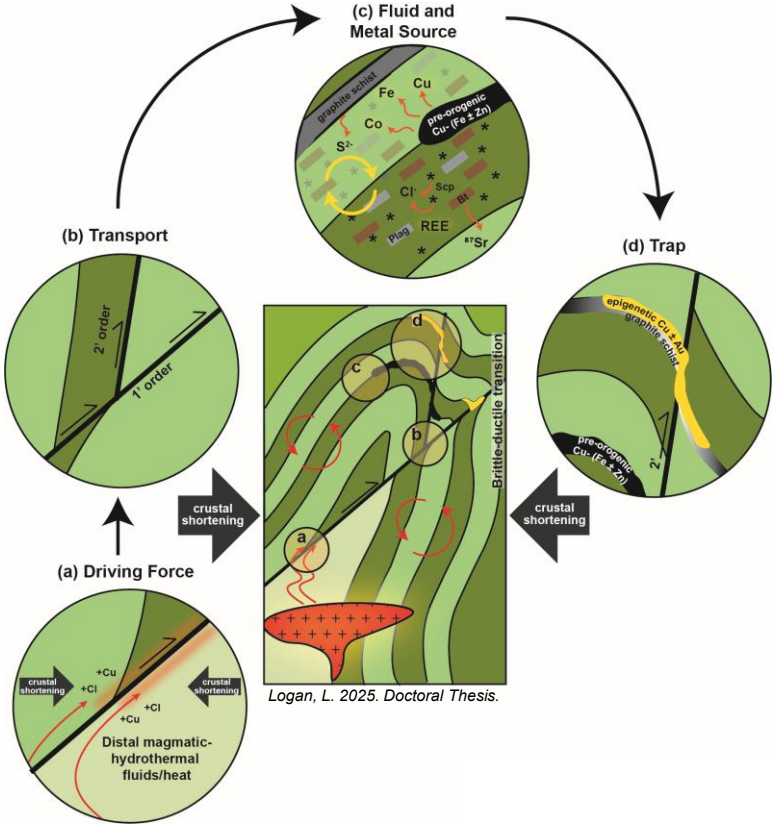

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Thank you!

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