



UNIVERSITÀ DEGLI STUDI DI MILANO

Corso di Dottorato in Scienze della Terra



13th-17th March 2023 - Short course (4 cfu, 20 hours) – Room to be established
Dipartimento di Scienze della Terra “A. Desio”, via Mangiagalli 34, Milano

Geodynamics, Metallogeny and Georesources

by Prof. Patrick Ledru



PROGRAM

- Geodynamics and mineralizations
- Exploring georesources
- Metallogeny of the uranium mineral system



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For information and to register, please contact:

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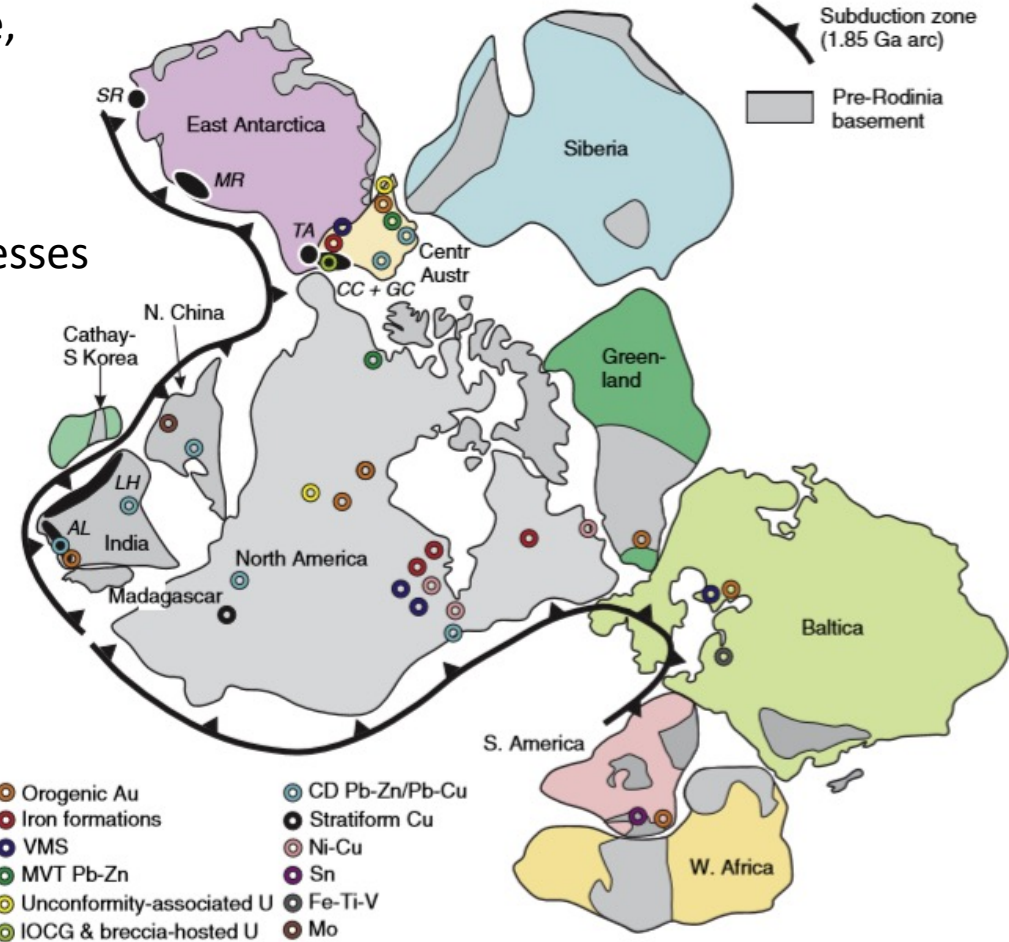
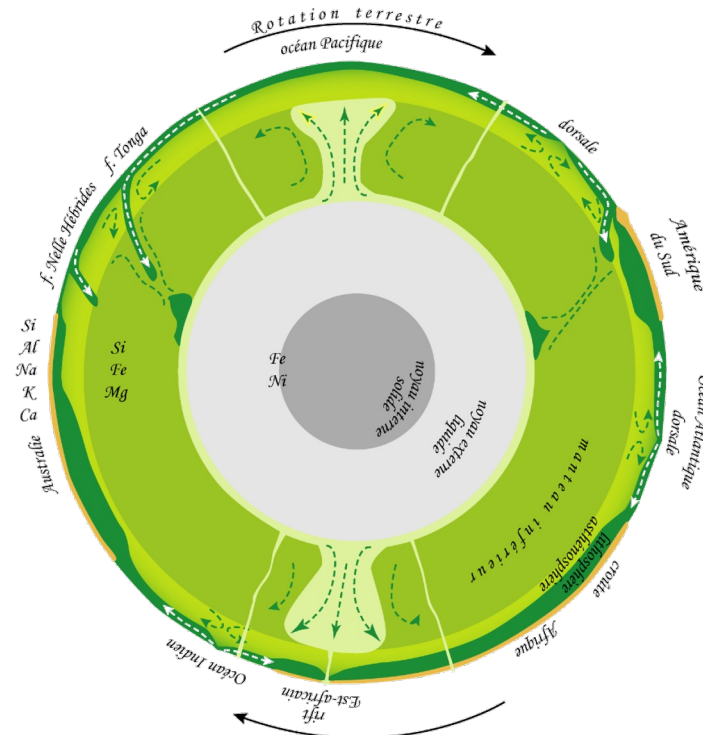
Course description

• Geodynamics and mineralizations

• Geodynamic processes control the source, transfer, trapping and preservation of ore deposits

• Metallogeny marks the geodynamic processes

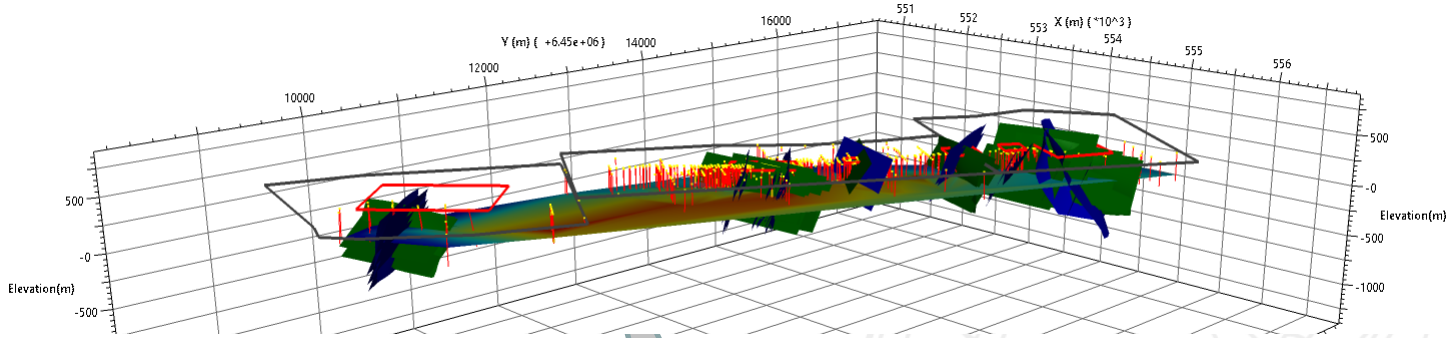
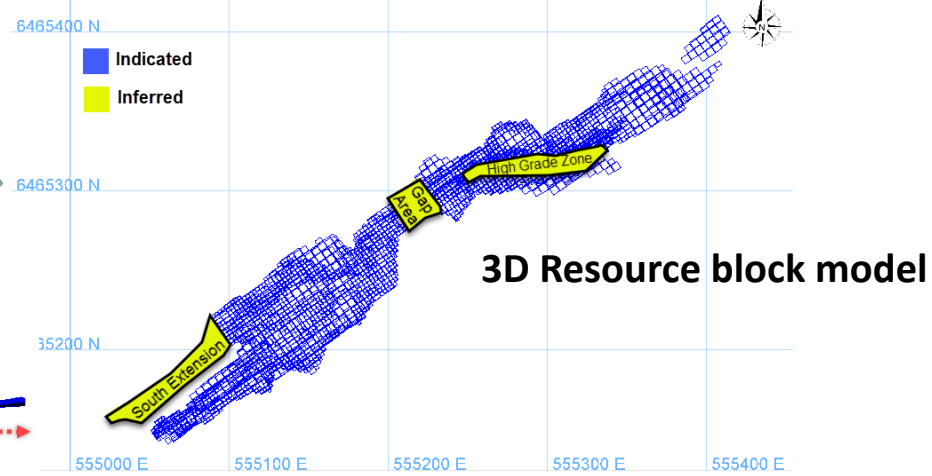
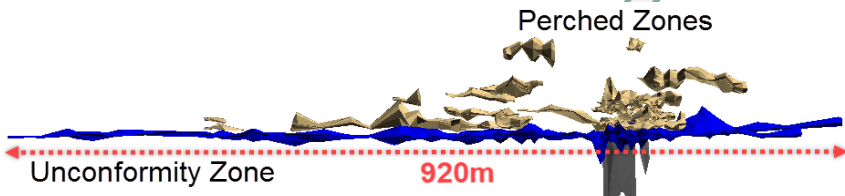
P. Kaur, N. Chaudhri / Ore Geology Reviews 56 (2014) 415–422



• Exploring georesources

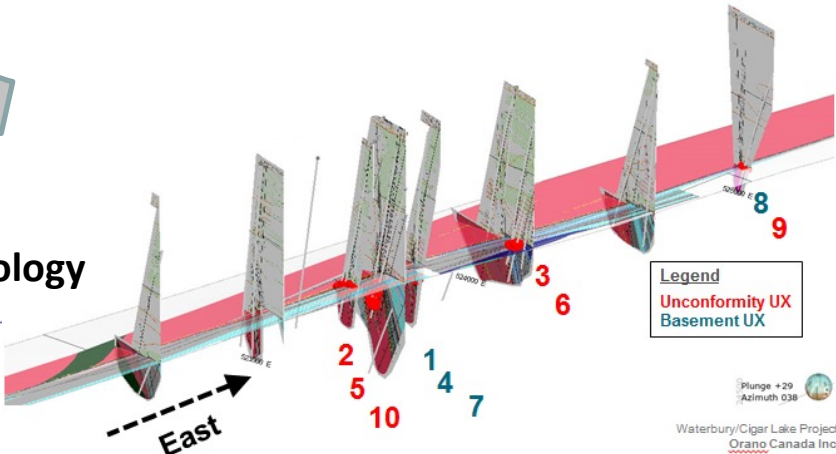
• Why, where, when, who, how?

• Resources and reserves

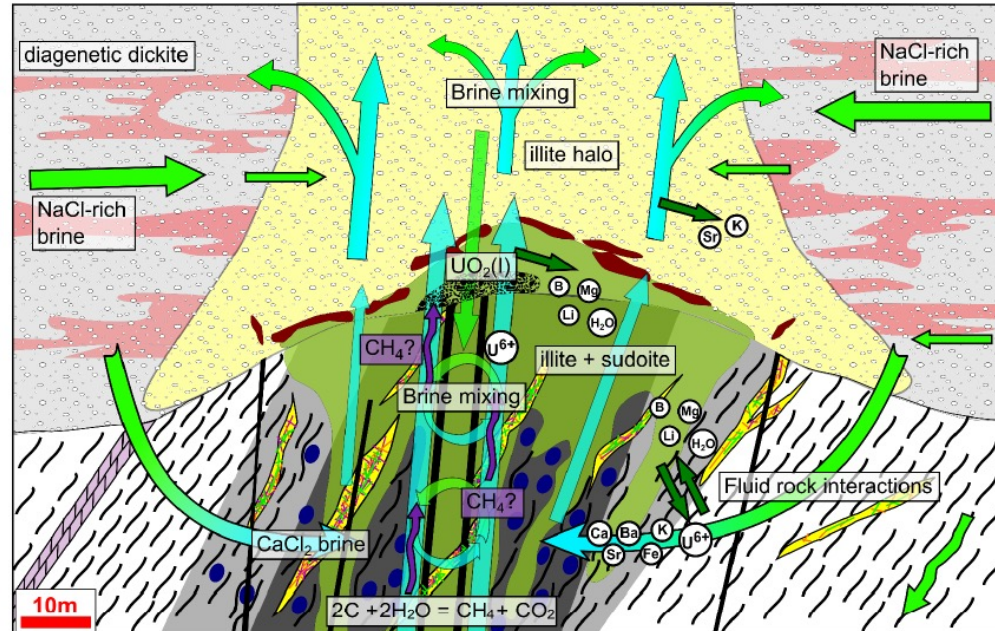


3D Common Earth Model

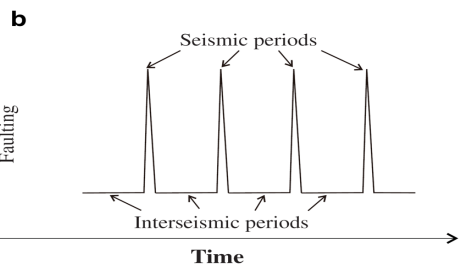
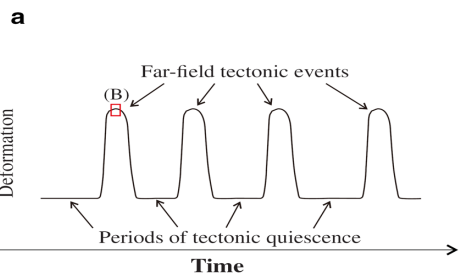
2D Cross sections & interpreted geology



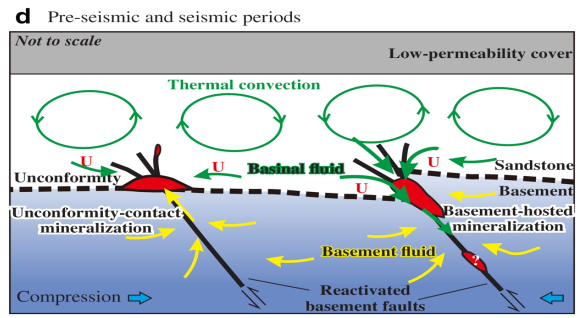
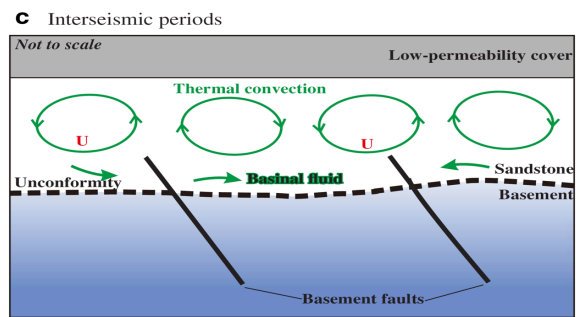
Legend
Unconformity UX
Basement UX



1290-1380 Ma
 Primary mineralization
 - Reactivation of the E-W shear zone
 - Intense circulation and convection of the oxidized basinal fluids into the structure
 - Strong fluid-rock interactions with the basement lithologies, metal + U uptake and transport.
 - Evolution of the fluid toward a highly saline CaCl₂ dominant composition.
 - Syn ore alteration characterized by quartz dissolution, illite precipitation in the basin and illite, sudoite +/- Mg fofite in the basement
 - Graphite consumption and CH₄ production: a possible reducing agent for UO₂(l) precipitation?
Legend
 Calc-silicates, Pegmatites, CO₂ FIPs, C-O-H-N FIPs, Brine FIPs, Anagen gneiss, Sandstones, Metapelite gneiss, 2-5% Graphite, >5% Graphite, Graphitic cataclastite and breccia >20% graphite



Li et al., 2020



• **Metallogeny of the uranium mineral system**

- Thermal, Hydraulic, Mechanic and Chemical modelling of fluid transfer and fluid rock interaction



Course program

		10.00-13.00	14.00-17.00
Monday	March,13	-	Welcome and Course presentation Geodynamics and mineralizations
Tuesday	March,14	-	Project Generation: conventional and unconventional resources
Wednesday	March,15	Exploring georesources: Targeting uranium, gold and geothermal systems	Drilling, coring and structural geology
Thursday	March,16	Drilling, coring and structural geology case studies	Metallogeny of the uranium system
Friday	March,17	Metallogeny of the uranium system	Resources and reserves Course ending at 16.00

