

Università degli Studi di Milano - Bicocca Dipartimento di Scienze dell'Ambiente e della Terra



AVVISO DI SEMINARIO

Mercoledì 30 ottobre 2019, ore 15 Aula U4 - 2034 (edificio U4, secondo piano)

A journey through the geochemistry of subduction-zone serpentinites and their dehydration products: insights into the deep recycling of elements Dr. Enrico Cannaò – Università di Milano



The chemical and tectonic processes taking place at subduction zones play a crucial role in the dynamic evolution of our planet likely since the early Earth period (at least 3.5 Ga). Metamorphic devolatilization reactions occurring during slab burial control the transfer of elements to the supra-subduction mantle, from forearc to sub-arc depths, and into the deeper part of the mantle. Within the main subducted lithologies, serpentinites are relevant to the global cycles of volatiles, halogens and fluid-mobile elements, as emphasized by increasing number of studies. Geochemical tracers (e.g., B, As, Sb; stable B and radiogenic Sr-Pb systematics) have been employed to discriminate the provenance of serpentinites (slab vs. wedge origin) accreted to the plate interface of fossil subduction zones. In turn, this helps defining the tectonic processes, seismicity and mass transfer attending rock burial and exhumation within subduction zones. Moreover, the potential of serpentinites to acquire sedimentary-like signatures during prograde interaction with metamorphic fluids allows them to act as trap-transport-release reservoir of primary importance in the Earth system. In this talk, I introduce the main geochemical tracers used to study subduction-derived serpentinites highlighting the importance of integrating different isotopic systematics to shed light on their subduction history. I discuss the geochemistry of secondary peridotites (i.e., dehydrated serpentinites) together with the geochemistry of entrapped fluid inclusions with major outcome to their role in the deep recycling of elements. Additional topics, such as carbon mobility and recycle during subduction of de-serpentinized rocks and carbonated ultramafic lithology (i.e., ophicarbonates), are also introduced.