In-situ studies of high-temperature fluids and melts (P < 2 kbar) and their application to Geosciences

The hydrothermal autoclave enables pressure and temperature conditions relevant to metamorphic and magmatic-hydrothermal crustal processes (200-900 °C and 300-1500 bars).

In this presentation, I will review how the hydrothermal autoclave can be combined with different spectroscopic technics (Raman, X-ray absorption) to study the physico-chemical properties of fluids and melts, with dedicated examples on the aqueous complexation of Rare Earth elements in mineralizing fluids and density of H_2O-CO_2-NaCl mixtures. I will also present new developments that are currently under way to enable the in-situ study of volcanic degassing.