

Distribution and beneficiation of critical raw materials in the Roman Magmatic Province

(Proposer: Prof. Paolo Nimis)

Critical Raw Materials (CRMs, including REE, fluorspar, barite, etc.) are strategic materials at high supply risk. Many CRMs are essential for the green transition and a dramatic increase in their demand is expected in the next future. The Roman magmatic province (RMP) in Central Italy hosts one of the largest light-REE fluorspar-carbonatite belts in Europe and the largest, but still underdeveloped fluorspar deposit in Western Europe. Although the very fine-grained RMP fluorspar is currently used only in relatively low-value applications (cements), it has potential for recovery of higher-grade fluorspar, LREE+Y and barite, which have many high-tech and green-tech applications. Upgrade of the RMP fluorspar may only be possible through ad-hoc beneficiation processes.



The present project has three main tasks: 1. consolidating CRM resource estimates in the RMP, building on field geological data, supported by drone-borne hyperspectral surveys, and detailed mineralogical and geochemical characterisation of samples from different and, in some cases, underexplored localities; 2. developing efficient and environmentally sustainable ad-hoc beneficiation methods, tailored to the specific properties of the minerals in the ores; 3. building an exploration-oriented, mineral-system ore deposit model.

The project will be carried out in collaboration with the Universities of Chieti–Pescara (geological and geochemical surveys) and Modena–Reggio Emilia (industrial process design and engineering) and with a local industrial mining partner, and will be supported by funds of Progetto Premiale-Progetto di Eccellenza, Department of Geosciences (PI: Paolo Nimis).