UNIVERSITÀ DI PAVIA
DIPARTIMENTO DI SCIENZE DELLA TERRA E DELL'AMBIENTE
DOTTORATO DI RICERCA IN SCIENZE DELLA TERRA E DELL'AMBIENTE

FORM PER PROGETTI BANDO DOTTORATO

1. Project title

From source to sink: investigating heavy minerals (sulfide, garnet) bearing sediments as unconventional reservoirs of critical raw materials through an integrated microanalytical workflow

2. Proposer

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3. Research Unit

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4. Keywords
(Max. 5 – at least 2)

Rare earth elements, Sedimentary reservoirs, Energy transition, Geochemical tracing

5. Abstract
(Max.1.500 characters with spaces)

Securing Critical Raw Materials (CRMs) is a key challenge for the energy transition. The project aims to investigate the fate of heavy minerals (e.g., garnet and sulfides) from their primary host rock to fault-related lithologies and sedimentary systems. These minerals can host critical elements and their accumulation in sediments may represent unconventional reservoirs of strategic resources. By integrating source-rock studies with sedimentary systems enriched in heavy minerals (e.g., well cuttings and sedimentary deposits), the project will reconstruct source-to-sink pathways controlling the redistribution and concentration of critical elements. The research combines field data, industrial datasets and advanced microanalytical techniques to assess the processes governing the accumulation of heavy minerals in fault rocks and sediments, providing new insights for the evaluation of unconventional resources relevant to the energy sector.