



“G. d’ANNUNZIO” UNIVERSITY  
DOCTORAL CYCLE XXXVI  
“EARTHQUAKE AND ENVIRONMENTAL HAZARDS”



4<sup>th</sup> EEH WELCOME DAY, 18<sup>th</sup> March 2021  
Endogenous and anthropogenic hazards for risk mitigation



Ph.D. student: **Maria Grazia Perna**  
Date and place of birth: **15<sup>th</sup> December 1994, Isernia (IS)**  
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Tutor: **Professor Francesco Stoppa**  
Co-tutor: **Professor Brent T. Poe**

2016

2019

2019

2020

2020

**Bachelor’s degree in Geological Sciences**

Thesis in Mineralogy:  
«QUANTUM ESPRESSO: introduction, installation and first DFT calculations»

**Master’s degree *cum laude* in Geological Sciences & Technologies**

Thesis in Applied Mineralogy:  
«Calculation of diffusion processes through the "Nudged-Elastic Band" method: the case of hydrated forsterite»

**Scholarship fellow**

Research:  
«Study of complex phases of rare earths and critical metals»

**Partecipazione to GSA Conference 2020**

«REE-phases in Fluor-carbonatite and Fluor-syenite from the Roman Region, Central Italy»

*Perna M.G. & Zaccaria D.*

**Ph.D. student**

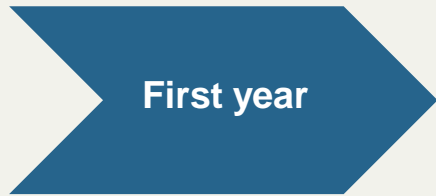
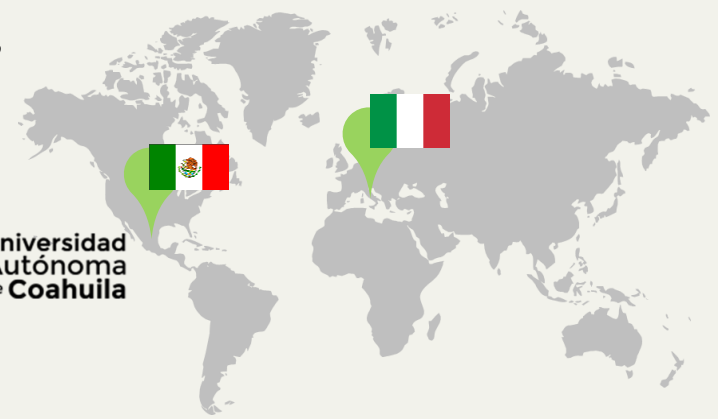
Research project:  
«**An insight into new technologies for the beneficiation of REE ores and for the mitigation of the environmental hazard associated with the extraction and processing of rare earth minerals and critical metals**»

Find new **technologies** and new **methods** for a **sustainable exploitation** of REE, considering **beneficiation processes** and **by-products recovery**

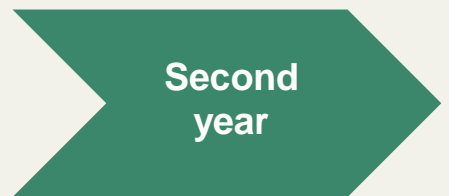


Increase the **geological knowledge** about **REE-deposits**, through the study of two areas

1. Roman Region of Central Italy
2. Sierra La Vasca e Sierra De Cruces of Northeastern Mexico



**Collection and analysis of data and samples from the Roman Region and the Eastern Alkaline Province of Mexico** for the definition of the main REE-rich mineralogical association



Understanding the **formation processes of the REE deposits**. Wider knowledge about the **different beneficiation processes** and **design of a suitable mineral beneficiation process**



**Application of the new method found and creation of an optimized protocol**



**Aims** of the first year

- Participation at italian and international conferences
- Submission paper in preparation «**Emblematic REE-phases evolution during carbothermal-hydrothermal stage of a carbonatite-syenite system (Roman Region, Central Italy)**»

