



University of Genova

Department of Earth, Environmental
and Life Sciences
Doctorate Course in Earth and
Environmental Science and
Technology
Earth Science Curriculum

Università degli Studi di Genova



Dottorato in Scienze e Tecnologie
per l'Ambiente e il Territorio

Research Theme n. 6

Titolo: *Correlazioni fra il sistema ad arco vulcanico Ordoviciano sardo ed il coevo sistema Pirenaico-Montagne Norie: una possibile ricostruzione dell'apparato vulcanico Caledonico sud Europeo?*

Title: *Correlations between the Sardinian Ordovician volcanic arc and the coeval Pyrenean-Montagne Norie system: a possible reconstruction of the southern European Caledonian volcanic system?*

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The overlap of the Varisc Orogeny with the Caledonian one has been demonstrated and traced back to geodynamic models in Armorica-Cadomia, in the ocean of Iapetus, in the Silane terrane, in the transcendent Teisseyre-Tornquist and in the Alleghanian chain. In the Sardinian segment of the Variscan belt, intrusions and dikes of the Middle Ordovician age and thermo-metamorphism overprint on the middle Cambrian host, have opened up correlations on the relationships between pre-Variscan and Variscan events, in analogy to the Eastern Pyrenees (Canigó Massif) and the Montagne Noire (Somail Massif).

The three-year doctorate's project involves an investigation through the following stages:

- 1) Structural characterization at the macro and micro scale with cartographic restitution of the less known intermediate-acidic rocks of the Middle Ordovician age outcropping in the Northeastern Sardinia (Ogn di Lodé – Mamone, Ogn of San Lorenzo associated with the Tamarispa calcisilicate host).*
- 2) Their petrographic characterization in collaboration with Proff. Marcello Franceschelli and Gabriele Cruciani, Dipartimento di Scienze Chimiche e Geologiche – Università di Cagliari.*
- 3) Compositional and isotopic Sm-Nd investigations to characterize the contributions of different magma sources.*
- 4) Radiometric dating by U-Pb systematic of the igneous lithostratigraphic units of undetermined age, aimed at verifying a possible diachrony in the emplacement of the intrusive rocks.*

The research objectives are:

- 1) Correlation between the elements of the Middle Ordovician arch in Sardinia and in analogues of the Armorican sectors of literature.*
- 2) Construction of a geodynamic model of the Caledonian arc system for the sector analyzed, and its structural and tectonic inheritance in the subsequent Variscan orogenesis.*

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Tutor's publications

- 1) Elter F.M., Gaggero L., Mantovani F., Pandeli E., Costamagna L.G. (2020) - The Atlas -East Variscan- Elbe shear system and its role in the formation of the pull-apart Late Palaeozoic basins. International Journal of Earth Sciences, 109, 739 – 760.*
- 2) Costamagna L.G., Elter F.M., Gaggero L., Mantovani F. (2016) – Contact metamorphism in Middle Ordovician rocks (SW Sardinia, Italy): new paleogeographic constraints. Lithos, 264, 577 -593.*
- 3) Padovano M., Dorr W., Elter F.M., Gerdes A. (2014) – The East Variscan Shear Zone: Geochronological constraints from the Capo Ferro area (NE Sardinia, Italy). Lithos, 19-197, 27 – 41.*