

**Title:**

Integrated analysis of geological and geophysical data for the characterization of active faults in the Sannio-Matese area (southern Apennines, Italy)

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**Proposal**

The Sannio-Matese region is a complex seismotectonic area characterized by historical seismicity of high energy located on the chain axis, along NW-SE direction faults, and by seismicity with medium-low energy swarms mainly located along transversal structures. Among the seismic events recorded in the area, the earthquake of 5 June 1688 ( $M_w = 7.0$ ) is of high scientific interest, not only because it is one of the most catastrophic events causing serious damages, with consequences on southern Italian economy, but also because the geometry and location of its seismogenic fault are still debated today. To better characterize the seismogenic framework of the Sannio-Matese area, it is crucial to investigate and constrain the fault systems activated by this seismic event.

**Research Program**

The research project is aimed at: i) acquisition and inversion of geophysical data in the Sannio-Matese area; ii) multivariate analysis of geophysical data (gravimetric, geoelectric, seismological) and geological/geomorphological data for the identification and characterization of possible fault systems activated by the historic Sannio-Matese earthquake of 5 June 1688. To achieve this objective, the PhD project involves the use of different methods of numerical analysis in the MATLAB environment. The analysis will be performed on parameters deriving from: multiscale "edge analysis" of geophysical data; seismological review of the 1688 earthquake from a macroseismic point of view using the classical macroseismic scales (MCS, EMS), as well as the ESI-07 scale; geomorphic-quantitative analysis for the study of medium and long-term tectonic deformation.