



SALTGIANT ETN – Early Stage Researcher in tectonophysics of the Mediterranean – ESR 2

Title	Isostatic vertical motions during the Messinian salt giant
Duration	36 months
Expected start date	October 2018
Host Institution	ICTJA-CSIC (Consejo Superior de Investigaciones Científicas in Barcelona; ictja.csic.es)
Primary Supervisor(s)	Daniel Garcia-Castellanos
Objectives	<p>To understand the vertical motions of the Mediterranean margins due to the extreme redistribution of isostatic load during the formation of the MSG, ESR 2 will use large seismic data compilations available from CSIC, Toulouse Univ., and Pavia-ENI, together with deep well logging, for 3 marginal regions: the Balearic promontory, the Alboran Basin, and the Po Basin. This will allow to constrain the vertical epeirogenic motions since the Late Miocene. The seismic data will provide a detailed, 3D imaging of the erosion surface and salt cumulates characterizing the last stages of the formation of the MSG. Assessing the original vertical position of these features will test the consistency of competing proposed hypotheses on their formation across multiple study areas and will put the student in contact with top-quality, up-to-date data sources and geodynamic concepts. The vertical restoration of the original depth of formation of the erosion surface formed during the deposition of the MSG will be carried out through a 3D (planform) backstripping technique, i.e., by isostatically compensating the weight of the post-Messinian sediment and the water column, and by estimating the de-compaction of the underlying sedimentary layers. For the isostatic compensation, a diversity of numerical models will be used, with mechanical properties constrained from the lithospheric structure underneath the study region and from previous studies of potential field inversion.</p> <p>Supervisors: D. Garcia-Castellanos.</p>
Expected results	<p>The restoration of the original vertical position of the Messinian strata and the establishment of quantitative links between the mechanical response of the lithosphere and the available and upcoming heat-flow and borehole data.</p> <p>Completed MSc or Diploma degree in Geophysics, Physics, Geology, Earth Sciences, Geoinformatics, or related fields.</p>
Specific requirements	<p>Programming skills (Python, C, scripting) and familiarity with linux environments for scientific computing and graphic visualization.</p> <p>Geological background in seismic reflection data and basin analysis.</p> <p>Interest in geodynamics and Earth's surface processes.</p>
Planned secondments	<p>Univ. Pavia (Pavia, Italy) (A. Di Giulio for Po Plain seismics data interpretation); Ente Nazionale Idrocarburi (Milan, Italy) (for access to the ENI data room and for Po Plain seismics data interpretation); Université Paul Sabatier (Toulouse, France) (A. Maillard for training on interpretation of offshore Balearic existing data and use of compilations)</p>
Provided by SALTGIANT partners to ESRs; duration 1-3 month each	

Keywords

Tectonophysics; Geodynamic modelling; isostasy; Messinian salinity crisis; stratigraphy.

Application

Send application via: www.ipgp.fr/saltgiant

For further information

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