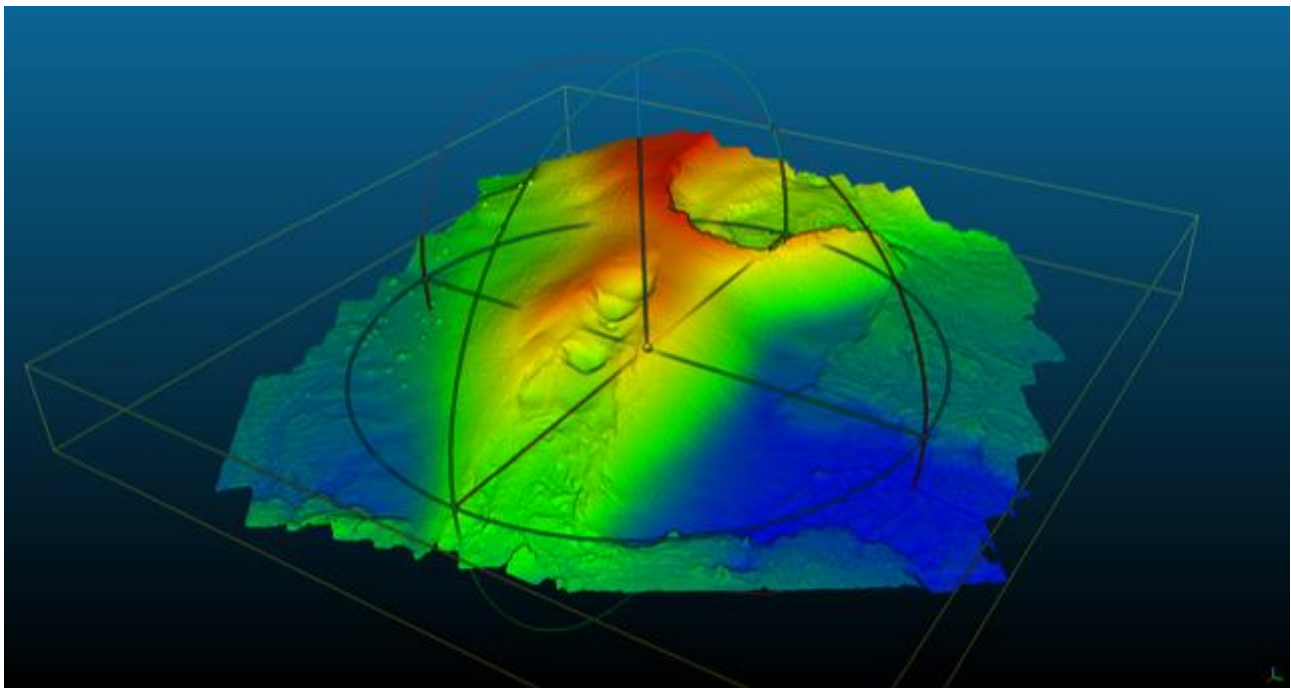


Hyperspectral and close range remote sensing of fault mineralization and phreatomagmatic systems

(Proposer: Prof. Matteo Massironi)

Close range remote sensing integrated with hyperspectral acquisition can be effectively applied for geological mapping, mining resource assessment, fault architecture and fluid rock interaction analysis. The HYPEREARTH consortium of the University of Padua has been recently acquired a hyperspectral spectrometer in the Visible and Short Wave Infrared wavelength ranges that can be applied on UAV or used as a laboratory device. The project aims at applying a combination of (i) 3D multi-scale (from macro to micro) quantitative structural analysis and (ii) multi- and hyper-spectral remote-sensing of mineralization and alteration halos along faults and on phreatomagmatic systems. This work should lead to a better comprehension of the fluid rock interaction along fault zones and in play during phreatomagmatic events. The analysis of phreatomagmatic systems will be specifically carry out in Lanzarote (Canarie Island) with the aim of characterizing one of the best volcanic analogue henvironment of Martian volcanic fields.



The PHD student should carry out his research in the field and in laboratory. In the field he will realize 3D digital outcrop characterization combining close-range photogrammetry and hyperspectral imaging on different environments. The laboratory activity will complement the field one and will be devoted to: 1) set up and calibrate a hyperspectral acquisition system using the field hyperspectral device, 2) characterize the geological materials sampled in the field though XRPD and Raman analysis, 3) acquire their spectral signatures in the VNIR, SWIR and TIR ranges.

Collaboration: HYPEREARTH consortium members of the University of Padua; ESA-EAC staff involved at the PANGAEA-X field analogue activity

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