Cristian Carli

Affiliazione: Istituto Nazionale di Astrofisica (INAF)

Contributi Proposti

Title: OLivine-Bearing ungrOuped achonDrItES: OL-BODIES

Authors: Cristian, Carli, IAPS - INAF Roma; Anna, Barbaro, Dipartimento di Scienze della Terra e Ambientali - Università di Pavia; Giovanni, Pratesi, Dipartimento di Scienze della Terra - Università di Firenze; Maria Chiara, Domeneghetti, Dipartimento di Scienze della Terra e Ambientali - Università di Pavia; Antonio, Langone, IGG - CNR Pavia; Matteo, Alvaro, Dipartimento di Scienze della Terra e Ambientali - Università di Pavia; Martina, Casalini, Dipartimento di Scienze della Terra - Università di Firenze; Mara, Murri, Dipartimento di Scienze della Terra e Ambientali - Università di Pavia; Vanni, Moggi Cecchi, Museo di Scienze Naturali, Università di Firenze; Ted L., Roush, NASA - AMES Research Center Moffett Field CA USA.

Abstract: Sample return missions are at present one of the primary goals of Solar System exploration. Different missions addressing that goal are ongoing (e.g. Hayabusa 1 and 2; OSIRIS-REx). Nevertheless, a natural sampling of our Solar System bodies are meteorites that provide important information about their parent bodies, spanning from the most primitive, associated with the origin of our Solar System, to the most evolved ones. Among meteorites, those that have experienced a process of differentiation are achondrites, and they can span from primitive to highly differentiated. They are mainly composed of mafic minerals and feldspar. Within mafic minerals olivine is considered a paradox, as being a mineral forming the mantle of differentiated bodies, it would be expected to be present in a larger number of asteroids than it has been observed. We will present a project to investigate a set of ungrouped achondrites with variable amounts of olivine and other phases. Reflectance spectra obtained from the selected samples will allow us to associate them with their parent bodies family. Characterization by a multi-disciplinary approach of the other phases (e.g. pyroxene, graphite, spinel), when present, will help to constrain the genesis of the meteorites and the evolution of their parent bodies. We will show the preliminary results from the first samples studied, beginning with the Al Huwaysah 010 meteorite that is characterized by high abundance of olivine and augitic pyroxene, the spectral features document the mafic mineralogy, and the low visible-near-infrared spectral reflectance is in accordance with the reported presence of opaque phases like chromite, fine-grained graphite, and/or metals dispersed in the sample. The authors acknowledge financial contribution from the agreement ASI-INAF n.2018-16-HH.0

Thematic section: Meteore, meteoriti e polvere interplanetaria, Piccoli Corpi, Planetologia sperimentale e di laboratorio