IAF SPACE EXPLORATION SYMPOSIUM (A3)
Space Exploration Overview (1)

Author: Prof.Dr. Angelo Pio Rossi
Jacobs University Bremen, Germany, an.rossi@jacobs-university.de

Prof. Matteo Massironi
University of Padova, Italy, matteo.massironi@unipd.it
Dr. Francesca Altieri
INAF-IAPS, Italy, francesca.altieri@iaps.inaf.it
Dr. Carolyn van der Bogert
University of Muenster, Germany, vanderbogert@uni-muenster.de
Dr. Hiesinger Harald
Westfalische Wilhelms-Universitat, Germany, hiesinger@uni-muenster.de
Mr. Nicolas Mangold
Université de Nantes, France, nicolas.mangold@univ-nantes.fr
Dr. David Rothery
Open University, United Kingdom, David.Rothery@open.ac.uk
Dr. Matthew Balme
Open University, United Kingdom, Matt.Balme@open.ac.uk
Dr. Cristian Carli
INAF-IAPS, Italy, cristian.carli@iaps.inaf.it
Dr. Riccardo Pozzobon
University of Padova, Italy, riccardo.pozzobon@unipd.it
Mr. Andrea Semenzato
University of Padova, Italy, andrea.semenzato.3@studenti.unipd.it
Mr. Dario Pesce
University of Padova, Italy, pesce.dario@gmail.com
Dr. Francesca Zambon
INAF, Italy, francesca.zambon@inaf.it
Dr. Stephane Le Mouelic
Université de Nantes, France, Stephane.Lemouelic@univ-nantes.fr
Dr. Luca Penasa
University of Padova, Italy, uca.penasa@gmail.com
Ms. Erica Luzzi
Jacobs University Bremen, Germany, e.luzzi@jacobs-university.de
Prof. Vikram Unnithan
Jacobs University Bremen, Germany, v.unnithan@jacobs-university.de
Dr. Sabrina Ferrari
University of Padova, Italy, sab.ferrari@gmail.com

PLANMAP: GEOLOGICAL MAPPING SUPPORTING THE EXPLORATION OF THE MOON, MARS AND MERCURY

Abstract

Geologic mapping is a key element of planetary exploration in mission planning, orbital and rover reconnaissance, and target selection for in-situ analysis and sample return.

The vast amount of data collected by planetary missions on the Moon, Mars and Mercury in the last several years can be analysed using more comprehensive and modern approaches than the largely photo-geologic image interpretation of the 1970's. Geologic maps on Earth carry substantial subsurface three-dimensional information. In the past decades, such dimension lacked in most planetary mapping efforts, mostly due to limitation in underlying datasets. The integrated data analysis of recent surface and subsurface planetary data both from sounding experiments and stereogrammetry- or laser-based surface reconstructions can be matched with compositional information from hyperspectral data, in addition to image interpretation and crater size-frequency surface dating. Planmap aims at integrating, merging and augmenting all these distinct approaches.

Robotic and human exploration can directly benefit from methodological and technical advances of the Planmap approach as well as from its mapping products, that will embed results from complementary, heterogeneous datasets.

Data analysis and visualisation from Planmap will address both research and training needs. It will foster capacity building and interdisciplinary planetary exploration for planetary scientists, engineers, science and mission operators as well as astronauts. The use of state-of-the-art three-dimensional modelling, visualisation and virtual to augmented reality techniques and tools will allow for immersive data analysis and exploration.

Present and future landing sites for robotic and human missions on both the Moon and Mars will be primary targets for Planmap. All mapping products, derived datasets and code will be openly available to the community at large. Cross-fertilisation with other disciplines and for terrestrial applications beyond planetary geoscience is also envisaged.

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