ILEWG EUROMOONMARS RESEARCH, TECHNOLOGY & FIELD SIMULATION CAMPAIGNS

B.H. Foing[1,2,3] , A. Lillo[1,2,4], P. Evellin[1,2,5], A. Kołodziejczyk[1,2], C. Heinicke[2,3], M. Harasymczuk[1,2], L. Authier[1,2,4], A. Blanc[1,2,4], C. Chahla[1,2,5], A. Tomic[2], M. Mirino[1,2], I. Schlacht[2,3,6], S. Hettrich[7], T. Pacher[8], L. Maller[2,4,9], A.Decadi[7,10], J. Villa-Massone[7], J. Preusterink[2], A. Neklesa[2], A. Barzileye[2], T. Volkova[2], [1]ESA/ESTEC & [2]ILEWG Euro-MoonMars 2017 (PB 299, 2200 AG Noordwijk, NL, Bernard.Foing@esa.int), [3] VU Amsterdam, [4] Supaero Tou-louse, [5] ISU Strasbourg, [6] Extreme Design, [7] SGAC, [8] Puli team, [9] EAC European Astronaut Centre, [10] ESA HQ

Introduction: ILEWG developed since 2008, "Eu-roMoonMars" an evolving pilot research programme starting with a Robotic Test Bench (ExoGeoLab) and a Mobile Laboratory Habitat (ExoHab) at ESTEC . They can be used to validate concepts and external instru-ments from partner institutes. Field campaigns have been conducted in ESTEC, EAC, at Utah MDRS sta-tion , Eifel, Rio Tinto, Iceland, La Reunion, Hawaii, and LunAres base at Pila Poland in summer 2017.

Goals of EuroMoonMars & ExoGeoLab: We in-tegrated instruments integrated in an ExoGeoLab test bench, along a methodic hands-on research:

1) We procured and adapted instruments to equip a small ExoGeoLab demo lander. Some instruments can also be used on a small or mid-size Rover. some in-struments can be brought for field site campaigns.

2) This terrestrial payload (instruments, sensors, data handling) has been deployed, operated and used as collaborative research pilot facility (ExoGeoLab), first tested and operated at ESTEC & transportable

4) We have implemented the possibility of remote control of instruments from an adjacent mobile labora-tory, and a remote science desk.

5) The suite of measurements includes a comprehen-sive set with telescopic imaging reconnaissance and monitoring, geophysical studies, general geology and morphology context,geochemistry (minerals, volatiles, organics), subsurface probe, sample extraction and retrieval, sample spectroscopy analysis.

6) We have reproduced some simulation of diverse soil and rocks conditions (mixture of minerals, organics, ice, penetrations of water, oxydant, organics, living organisms & plants) and diagnostics

7) We used these instrument packages to characterise geological context, soil and rock properties

8) Science investigations include geology, geochemis-try, mineral, oxydant, organics, volatiles & biomarker diagnostics.

9) After first validations we started to exploit the facili-ty for collaboration with partners that have provided some additional guest instruments, and performed spe-cific investigations,

10) We can make use of the mobile lab habitat ExoHab for logistics support and local operations.

11) An additional ExoBiology Laboratory module (ExoLab) has been equipped to support related tech-

nical research. A new version ExoLab 2.0 was devel-oped over summer 2017

12) From this test bench and kit of ExoGeoLab instru-ments, we plan to operate comprehensive instruments packages that could help in the technical research and science preparation of future lander/rover missions.

This research can benefit Science, Exploration or Ap-plication programmes, and isc used in support of Inter-national Tasks Groups such as ILEWG, IMEWG, ISECG, space agencies, and research partners.

EuroMoonMars field campaigns: We have or-ganised field campaigns using selected instruments from ExoGeoLab suite in specific locations of tech-nical, scientific and exploration interest. Field tests have been conducted in ESTEC, EAC, at Utah MDRS station, Eifel vocano region, Rio Tinto, Iceland, La Reunion, Hawaii. These were organised by ILEWG in partnership with ESTEC, VU Amsterdam, NASA Ames, GWU in Utah MDRS (EuroGeoMars 2009, and then yearly for EuroMoonMars 2010-2013).

EuroMoonMars field tests 2017 were at ESTEC in July and at LunAres base at Pila Poland from August.

We thank ILEWG EuroMoonMars 2017 campaign crew at ESTEC (here in figure with ExoGeoLab lander & Puli Rover) & teams at simulation campaigns (PMAS, LUNEX1, IcAres) at LunAres base, Poland.

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