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access**

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PP	Restricted to other programme participants (including the Commission Service)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (excluding the Commission Services)	

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Abstract: Under Horizon 2020, the Europlanet 2020 Research Infrastructure (EPN2020-RI) “The Distributed Planetary Simulation Facility (DPSF)” (TA2) provides European users access to seven internationally renowned research centers that enable the simulation or characterisation of planetary conditions and materials. The expanding planetary exploration program is generating an increasing demand for simulation facilities from European scientific and industrial communities to aid with key mission goals; instrument design; validation of instrument performance; to obtain a better understanding of the physical-geological processes that formed specific planetary environments and the biogeochemical processes that control the likelihood that life could evolve or survive.

Laboratory based simulations and analysis are a vital component in understanding other planetary environments. In research they are a crucial complement to observation and modelling, but importantly they can be a key in developing the technology for Europe’s extensive plan for robotic planetary exploration. The TA2 program provides access to seven internationally outstanding facilities, allowing industrial and research communities with unique opportunities for collaboration.

In this report the latest TA2 research activities for the “Distributed Planetary Simulation Facility” will be presented, having now carried out three rounds of international competitive selection (calls) for access, details will be given of the specific projects which have been selected and carried out and of the research groups which have been involved.

These facilities have a broad range of functionality and are all at the cutting edge of advanced technology, in this respect several have undergone recent improvements in infrastructure, extending capabilities and adding new abilities. These improvements include a range of upgrades recently completed as part of the JRA2 activities.

As detailed in D8.1; 8.2; 8.3 new technology has been developed in three facilities as part of JRA 2 to provide users with improved capabilities. These new capabilities have been validated and are now available for subsequent TA applications and in most cases have already been used, at least in part, in the last round of TA visits. The improved capabilities include:

- 1) At the Aarhus Planetary Environment Facility;
A particle image velocimetry system,
A dedicated gas cooling system and
A UV solar spectrum simulator.
- 2) At the DLR Planetary Emissivity Laboratory;
Design development and validation of a high temperature Spectrometer system to
expand the available spectral range.
- 3) At the CNRS-IPAG cold spectrometer facility;
Commissioning, development and validation of a micro-spectro gonio radiometer.

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Ice spectroscopy, Institut de Planétologie et Astrophysique de Grenoble (IPAG) Grenoble, France; http://ghosst.osug.fr/wiki/index.php/Spectro-Gonio_Radiometer	7
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1. Publicity and selection process

For information regarding the publicity and selection procedure please refer to D4.3- First Annual report of TA3 access.

2. Explanation of the work carried out by the beneficiaries and Overview of the progress for TA2

Planetary Emissivity Laboratory, DLR, Institute for Planetary Research, Berlin,
http://www.dlr.de/pf/en/desktopdefault.aspx/tabid-178/327_read-37513/

PEL had four TA2 visit (with a total of 7 persons visiting) in the reporting period

Teresa Seixas (Faculty of Science University of Porto, Portugal – Inclusiveness), FEMALE, and **Manuel Salgueiro da Silva** (Faculty of Science University of Porto, Portugal – Inclusiveness), MALE from 21/11/2016 to 25/11/2016: **Modelling Of Reflectance Spectra Of Asteroids.**

We have submitted one abstract to the next EPSC (September 2017). We expect that the results of this study will result in at least one publication, actually in draft format. Project number: 16-EPN2-044.

Pierre Beck (Institut de Planétologie et d'Astrophysique de Grenoble, France), MALE, from 09/01/2017 to 13/01/2017, and **Alexandre Garenne** (Institut de Planétologie et d'Astrophysique de Grenoble, France), MALE, from 16/01/2017 to 20/01/2017: **Spectroscopy of primitive meteorites and the nature of dark asteroids.**

We expect that the results of this study will result in one to two publications. Project number: 16-EPN2-063.

Barbara de Toffoli (University of Padova, Italy), FEMALE, from 23/01/2017 to 27/01/2017, and **Cristian Carli**, (IAPS-INAF, Rome, Italy), MALE, from 23/01/2017 to 27/01/2017: **Spectroscopy of clays and epithermal ore minerals: clues for the detection of past and present shallow depth water circulation and hydrothermal activity on Mars.**

We expect that the results of this study will result in one to two publications. Project number: 15-EPN-022.

Claudia Stangarone (University of Parma, Italy), FEMALE, was visiting from 02/05/2017 to 26/05/2017: **Modelling of Mid infrared spectra of forsterite: application on remote sensing for planetary mission.**

We have submitted one abstract to the next AGU (December 2017). We expect that the results of this study will result in one to two publications.

Interactive Microbiome Research Group (IMRG) Medical University Graz (MUG), Centre for Medical Research (ZMF), Graz, Austria.

<http://www.medunigraz.at/zmf/>

The IMRG had no TA visitors in this reporting period, however one visit is already planned for next year.

Planetary Environment Facilities (PEF). University of Aarhus, Aarhus C, Denmark,
<http://phys.au.dk/en/research/facilities/planetary-environment-facilities/>

We have had 8 (successful) TA2 test campaigns (9 weeks of access), they are listed below and we have already generated more than 1.3 TByte of data and had 9 publications and 21 visiting researchers. We have 4 more weeks of TA access planned for 2017. The JRA2 improvements to the facility have been made and several of the TA2 access activities listed below have in fact (ahead of schedule) been utilized these improvements.

15-EPN-026 CO₂ Ice Mars

Anya portyankina@gmail.com, Zurine Yoldi zurine.yoldi@space.unibe.ch

1. Abstract submitted to; The Sixth International Conference on Mars Polar Science and Exploration (6th MPSE) will be held September 5–9, 2016
2. Abstract submitted to; Ices in Solar System workshop to be held January 2017 (Madrid)

15-EPN-003 Volcanic plumes

Jacopo jacopo.taddeucci@ingv.it, Elisabetta Del Bello elisabetta.delbello@ingv.it

3. Abstract submitted to; VOLCANO: CoV9. Conference in November 2016, abstracts - Session S2.2 Re-suspended Volcanic Ash: Forecasting, Modelling, Observations and Hazards.
4. Abstract submitted to; the EGU General Assembly 2017: Parameterization of volcanic ash remobilization by wind–tunnel erosion experiments. by Elisabetta Del Bello et al. submitted to GMPV4.5/AS3.7/NH2.6

The Abstract has got the identification number EGU2017-13873.

15-EPN-023 DREXS (DREAMS team)

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This was the most extensive test with 7 members of the DREAMS ExoMars 2016 team (5 were self-funded), this data was used in calibration of the 2016 Mars lander instrumentation which unfortunately crash landed.

15-EPN-008 Passive Acoustic Planetary Anemometer (PAPA)

Ralph Lorenz Ralph.Lorenz@jhuapl.edu

5. Abstract submitted to; Sixth International Workshop on the Mars Atmosphere: Modelling and Observations, Granada, Spain, Jan 17-20 2017.

15-EPN-016 3-D spherical thermal anemometer for Mars surface

Lukasz Kowalski lkowal@gmail.com

15-EPN-005 Experimental analysis of high-speed free jets at low Reynolds number

Joern Sesterhenn joern.sesterhenn@tnt.tu-berlin.de

Christian Westphal christian.westphal@cf.d.tu-berlin.de

Mathias Lemke mlemke@tnt.de

6. "Effects of the Reynolds number on the starting jet", Juan Jose Pena Fernandez and Jörn Sesterhenn, Physics of Volcanoes 2017, 07-09 März 2017, München, Germany

16-EPN2-035 Laboratory Simulations of Enceladus plume for in situ sample collection

Alfonso Davila alfonso.davila@nasa.gov

16-EPN3-(11202) Mars Microphone testing and LIBS acoustic characterisation for the Mars 2020 rover

Naomi Murdoch Naomi.MURDOCH@isae-superaero.fr

Jeremie Lasue mailto:jlase@irap.omp.eu

Philippe Cais philippe.cais@u-bordeaux.fr

Marti Bassas-Portus Marti.BASSAS-PORTUS@isae-superaero.fr

7. Abstract at EPSC conference 2017, Riga. "Microphone characterisation for the Mars 2020 rover", Naomi Murdoch, Alexandre Cadu, Anthony Sournac, Jon Merrison, Jens Jacob Iversen, Bruno Bousquet, Ralph D. Lorenz, Jeremie Lasue, Marti Bassas-Portus, Xavier Jacob, Sylvestre Maurice, David Mimoun

Other Publications;

8. "Contact electrification in aerosolized monodispersed silica microspheres quantified using laser based velocimetry", Stefano Alois, Jonathan Merrison, Jens Jacob Iversen, Jörn Sesterhenn, Journal of Aerosol Science 106 (2017) 1–10.

9. Abstract submitted to EGU General assembly 2016: Research at a European Planetary Simulation Facility by Jonathan Merrison et al., Session GI2.1/AS4.15/BG1.20/CL5.18/NH1.22/OS1.23/PS9.11/ST4.8 - Atmospheric and Meteorological Instrumentation. EGU2016-7963.

Ice spectroscopy, Institut de Planétologie et Astrophysique de Grenoble (IPAG)
Grenoble, France; http://ghosst.osug.fr/wiki/index.php/Spectro-Gonio_Radiometer

IPAG had 2 visits, each of them of 2 weeks for a total of 4 weeks of visitors (20 days). 7 people visited IPAG in this period.

1st visit: 2 weeks duration

- Olivier Poch, NCCR PlanetS, Physics Institute, University of Bern
- Antoine Pommerol, Physics Institute, University of Bern
- Zurine Yoldi NCCR PlanetS, Physics Institute, University of Bern

- Bernhard Jost Physics Institute, University of Bern

- Project number: 16-EPN2-026

- Project Title : Near- and mid-infrared spectroscopy of icy planetary/cometary analogue matter

Abstracts and talks at conferences:

A. Pommerol, N. Thomas, B. Jost, O. Poch, A. Galli, Z. Yoldi, Y. Brouet, Reflectance and other related physical properties of icy planetary analogues, Ices in the Solar System ESA/ESAC Workshop, 23-26 January 2017, Madrid, Spain

B. Jost, A. Pommerol, O. Poch, Z. Yoldi, Y. Brouet, C. Herny, N. Thomas, Laboratory experiments with analogues of primordial icy material, NCCR PlanetS General Assembly, 24 January 2017, Grindelwald, Switzerland

2nd visit: 2 weeks duration

- Federico Tosi, INAF-IAPS

- Simone De Angelis, INAF-IAPS

- Cristian Carli, INAF-IAPS

- Project number: 16-EPN2-028

- Project Title: Characterization of Hydrated Na-Carbonates at Cold Planetary Conditions

Abstracts and talks at conferences:

F. Tosi, C. Carli, S. De Angelis, Beck, O. Brissaud, B. Schmitt, F. Capaccioni, M.C. De Sanctis, G. Piccioni, 2017. Temperature-dependent VNIR spectroscopy of hydrated Na-carbonates. EGU General assembly 2017, Vienna, 23-28 April 2017.

High-Pressure, High-Temperature Laboratory (HPHTL), Geology and Geochemistry, VU University Amsterdam, Amsterdam, The Netherlands, www.falw.vu/~wwest/lab.html

HPHTL had no visitors in this reporting period.

Large Mars Chamber Facility (LMCF), Open University, Milton Keynes, United Kingdom, <http://www.open.ac.uk/science/physical-science/planetary-space-sciences/facilities/technicalsimulation>

LMCF had 3 visits in this reporting period, for a total of 5 persons visiting, and a total of 70 days of visits.

Kelly Pasquon, GEOPS (Géosciences Paris-Sud)

Julien Gargani, GEOPS (Géosciences Paris-Sud)

20 days

15-EPN-019

The role of transient liquid water in present-day landscape evolution on Mars

Matthew Sylvest, The University of Arkansas

Susan Conway, University of Nantes

25 days

16-EPN2-030

Laboratory experiments to investigate mass wasting triggered by carbon dioxide sublimation under martian conditions

Susan Conway, University of Nantes

25 days

16-EPN2-050

Grain saltation induced by boiling of metastable water on Mars → the development of a physics-based model

Petrology-Mineralogy Characterisation Facility (PMCF), Mineral and Planetary Sciences Division, Natural History Museum, London, UK, www.nhm.ac.uk

PMCF had 4 visits in this reporting period, for a total of 6 persons visiting and 40 days of total visit:

Dominik Hezel, Universität zu Köln

+ 1 person

10 days

15-EPN-017

3D μ -Tomography Analysis of Chondrule Zonation in Carbonaceous Chondrites

Ankit Verma

10 days

16-EPN2-015

The effect of impact on rock properties at Meteor Crater

Tanya Mohr-Westheide, Museum für Naturkunde Berlin

Tobias Salge, Museum für Naturkunde Berlin

10 days

16-EPN2-057

Characterisation of extraterrestrial component (ETC) carrier phases in Archean spherule layer material from the Barberton Greenstone Belt, South Africa, by means of high-resolution FE-SEM/EDX

Maurizio Gemelli

10 days

16-EPN2-065

The fractionation of refractory lithophile elements (RLE) and the oxygen isotope systematics in enstatite chondrites.

3. Deviations from Annex 1

An amendment of WP3 is currently under evaluation:

-HPHT (VUA): units of access decreased from 80 to 20

-PEF (Aarhus): units of access increased from 75 to 95

-PEL (DLR): units of access increased from 110 to 140

-LMC (OU): units of access increased from 120 to 150