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First Annual report of TA3 access

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PU	Public	x
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: The capabilities of facilities that comprise the three different distributed TAs were widely advertised making use of international conferences (flyers and posters at EGU, EPSC, LSPC, COSPAR etc) and specialist user-group e-mail lists and the web. Two calls for TA usage were made and a peer review process set up and overseen by an independent party (ESF). A total of 43 applications were received in call 1 and of which only 2 were considered ineligible based on technical and administrative grounds (e.g. multiple applications from the same group). A total of 57 applications were submitted in call 2 of which 5 were ineligible. To date 68 applications have been approved for a TA visit. [Here](#) more details.

To rigorously assess all the practical and scientific aspects of TA visits, the TA board, together with ESF, have prepared a feedback questionnaire to be completed by all TA users. The findings of these reports will be anonymised by ESF and delivered to the TA board who will advise TA facilities, where deemed necessary, on how to improve best practices.

To date 11 TA visits have been undertaken and 5 have provided an initial report on the nature and quality of the data produced. Projects undertaken as part of TA3 facilities generally involve extensive sample preparation and complex data analysis. Consequently at the end of year one we expect in addition more presentations at international conferences and publications of articles in science journals. Informal feed-back to the TA board and the project reports establish that high quality data has been produced and publications will follow.

JRA 3 is progressing well with presentations at conferences and 2 publications.

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1 Description of the publicity concerning the new opportunities for access

The overall TA program is managed by the TA board headed by Prof Gareth Davies, the leader of TA3, and includes TA leaders and their deputies (Gomez, Ori, Helbert, Merrison, Davies, Galy). Hence an overview of the measures taken to advertise the TA facilities, the number of applications made and approved and the time planning are discussed in the TA3 report and [here](#). This report also includes measures taken to obtain feedback from users to the facilities.

The specific report presented here includes reports of TA visits (undertaken and planned) to the three currently active TAs. In addition, a progress report is provided of JRA activities preparing two additional TA sites to be offered from the end of 2017. Although a report is not a deliverable, periodic reports are prepared for the TA-JRA board it was considered advisable to present an annual progress report.

The TA facilities have been widely promoted at: i) international conferences using flyers ii) e-mail lists obtained from planetary science conferences (e.g., European Planetary Science Congress (EPSC); Division for Planetary Sciences of the American Astronomical Society (DOS); Committee on Space Research (COSPAR).iii) new mailing list set for inclusiveness countries (from the beneficiary #18, Wigner RCP)

Advertising (e-mail and flyers) specifically focussed on the TA 3 geochemical analytical facilities were made at Lunar and Planetary Science Conference (LPSC) Houston 2015 & 2016 and Goldschmidt (the largest international Geochemistry conference; Prague CZ, 2015; Hokkaido, Japan 2016).

Please [download](#) deliverables D1.5 and D1.6 for more details on the calls.

2 Description of the selection procedure

The details of the anonymous peer reviewed process overseen by ESF are as follows

From the first call:

Considering the limited number of applications, one panel was set-up across all call elements

- 129 potential members were identified and invited in three waves
- 17 agreed to join and registered
- 9 eventually became members of the review panel: US (3), France (2), Germany (1), Italy (1), Morocco (1), Canada (1) – 2 women, 7 men
- Panel composition provided in annex 1.

Two rapporteurs (one lead and one secondary) were attributed to each application, according to panel members' expertise.

All panel members provided their pre-assessment (one mark per criteria and comments) by 22 January 2016, these were made available to the panel members before the meetings.

Panel meetings were held via Webex on 8 February and 15 February 2016. For each meeting all except one panel member participated.

For the second call:

- Considering the broad scientific area of the applications, one panel was set-up across all call elements
- 119 potential members were identified and invited
 - 13 agreed to join before the change of deadline and after the change of date only 10 agreed and registered
 - 10 eventually became members of the review panel: US (5), UK (1), Morocco (1), Czech Republic (1), Italy (1), Netherlands (1) – 2 women, 8 men
 - Panel composition provided in Annex 1.

Two rapporteurs (one lead and one secondary) were attributed to each application, according to panel members' expertise.

All panel members except one provided their assessments (one mark per criterion and comments) by 22 June 2016, these were made available to the panel members before the meetings. The missing assessments were provided and made available before the second meeting on 27 June 2016.

Panel meetings were held via Webex on 24 and 27 June 2016. Due to the allocation of proposals and the availability of the panel members, six panel members participated in the first meeting. For the second meeting, all except one panel member participated.

Beneficiary #22, ESF also provided a detailed breakdown of the applications in terms of the individual TA facilities and country of application. The TA board and the PMC have raised two areas of concern over the TA application process. First, despite extensive and focussed publicity, the number of applications from inclusiveness countries is surprisingly low. Publicity specifically focussed at inclusiveness countries has therefore been repeated and additional activities were targeted at planetary science meetings, for example the meeting held in Vilnius that links the COST action "Origins and evolution of Life in the Universe" and the Nordic Network of Astrobiology. The inclusiveness officer of the PMC (Prof Karoly Szego) is currently seeking feedback to understand why there have been relatively low numbers of applications from scientists from inclusiveness countries. This issue will remain an action point for the PMC and all TA facilities for 2016-17 and probably beyond.

The success rate of applications from inclusiveness countries were comparable to other countries. This fact is ascribed to the policy that TA facilities have been advised by the PMC to ensure that they specifically provide detailed advice on the preparation of applications to junior staff from inclusiveness countries.

The second action point raised by the TA board was the unequal success rate of applications to the three TAs in the second call. It is notable that in the recommendation from ESF that TA3 had a markedly higher success rate compared to TA1 (> 70 vs < 25%). An informal review by the TA board concluded that this is partly a consequence of the highly specialised nature of TA3 applications in that all involve the use of state-of-the-art instrumentation. Hence almost by default, applications to TA3 are undertaking ground breaking research that is highly innovative. As applicants are encouraged to discuss the technical aspects of their applications with the host facility before making the application, this also leads to a proportion of initial declarations of interest in using TA3 facilities being discouraged; i.e., a project is unviable in terms of the length of time needed to undertake the project or not technically feasibility. This led to no TA3 applications being rejected based on technical terms. In addition, the website gives comprehensive instructions on how to complete the application such that few applications were considered inadmissible. The initial contact also allowed the TA host facilities to advise applicants if their proposed project was liable to be considered "routine or unoriginal or not pertinent" to planetary science. This led to approximately 10 declarations of interest to TA 3 not resulting in a TA application. For example 6 different archaeology groups (3 UK, 1 France, 1 Belgium, 1 Germany) discussed the possibilities of applications to the VU TA facility but were advised that such research was outside the remit of Europlanet as they would fail one or more of the selection criteria. Following this advice the groups did not apply.

In contrast to TA3, TA1 applications will generally involve some “basic field work” to understand the context of the extreme geological habitat under study and then allow focussed sampling. Some of the analyses of the samples will involve “routine” analytical techniques to characterise the biological or chemical products formed in the extreme environments. Ultimately, integration of all these data has the potential to make major new observations about terrestrial analogues and their relevance to planetary environments. The TA board considered that this aspect of TA1 applications had been undervalued during the peer review process. These observations have been taken as an action point by ESF for subsequent calls. As a stop gap solution, the TA board decided to accept all applications that passed the cut off score of 13, even if they had failed one of the set criteria. This increased the funding proportion of TA1 to close to 50% but also raised the success rate of the other TAs (one additional project funded in TA 2 & 3).

Following the peer review process, each of the unsuccessful applications were provided with feedback from the peer review committee to advise them on the specific review criteria their proposal did not reach. This advice was designed to allow them to potentially make a more successful application in the future.

One successful application to TA3 has been withdrawn because the successful applicant will take up a faculty position in the US and will be unable to undertake the proposed analytical work within the next year due to new teaching and research commitments.

ESF passed on to the TA board a series of questions raised by the peer review committee related to multiple applications by a single person or a group of people. Based on these questions the application form has been revised and the website edited to make it clear that i) a person or team of people can only make one application per TA per call; ii) an individual person or research group is limited to 3 applications to a TA over the lifetime of Europlanet 2020 RI; iii) applications to different TA as part of an integrated study are permissible.

Details on the proposals from the first and second call can be downloaded from the [website](#) under deliverables D1.9 and D1.10.

Details on the results from the first call can be found under deliverables D2.1, D3.1 and D4.1.

Details on the results from the second call can be found under deliverables D2.4, D3.4 and D4.4.

3 Description of the Trans-national Access activity

The report from TA3 includes a summary of all the applications and the approved projects in the form of an Excel table that is added [here](#). Call 1 resulted in 43 applications of which 41 were considered eligible for funding. Funding was approved for 8 TA1 projects; 16 TA2 and 13 TA3 projects. In call 2, 57 applications of which 52 were eligible for funding. There was only one applicant the same as in call 1 and this application was rejected based on not having completed the application form correctly. Funding was approved for 31 projects; 4 TA1; 13 TA2 and 14 TA3 projects. Statistics on nationalities from the first and second call can be found in Table 1 and 2 respectively

Table 1- Statistics on nationalities from the first call (*- Inclusiveness countries)

Country	TA1	TA2	TA3	Total
BE			2	2
CH		1		1

DE	3	5	1	9
DK		1		1
ES		2		2
FR	1	2	2	5
HU*	1			1
IT	3	6	2	11
NL			2	2
UK	1	2	3	6
US		1	2	3
Total	9	20	14	43

Table 1b- Statistics on nationalities from the successful applications within first call (*- Inclusiveness countries)

Country	TA1	TA2	TA3	Total
BE			2	2
CH		1		1
DE	3	4	1	8
DK		1		1
ES		2		2
FR	1	2	2	5
HU*	1			1
IT	2	5	2	9
NL			2	2
UK	1	2	2	5
US		1	2	3
Total	8	18	13	39

Table 2a- Statistics on nationalities from the second call (*- Inclusiveness countries)

Country	TA1	TA2	TA3	Total
BO	1			1
CH		1		1
DE	1	5	1	7
ES	2		1	3
FR	1	2	2	5
GR	1	1	1	3
HU*		1		1
IE		2		2
IT	2	7	2	11
PL*		1		1
PT*		1		1
SE		1		1
US	1	3	2	6
UK			7	7
AU			1	1

NL			1	1
Total	9	25	18	52

Table 2b- Statistics on nationalities from the successful applications within second call (*- Inclusiveness countries)

Country	TA1	TA2	TA3	Total
AU			1	1
CH		1		1
DE		3	1	4
ES	1		1	2
FR		2	1	3
GR			1	1
IE		1		1
IT	2	3		5
NL			1	1
PT*		1		1
UK			6	6
US	1	2	2	5
Total	4	13	14	31

3.1 Scientific output of the users at the facilities

At the time of writing 2 TA visits have been completed or are on-going within TA3. None have been fully completed. A further 10 are scheduled before the end of the year. This apparent slow uptake is a consequence of the highly technical nature of the analyses involved that requires extensive sample preparation. Typically 3 months are required to prepare samples for isotopic analysis and data interpretation can take a similar length of time. Moreover writing up the results often requires extensive additional support data and therefore a turn round time of at least a year is typical before submission of results for peer review. Anecdotal evidence is that several of the very exciting projects that have been approved and that TA visits that have been started are delivering results that will lead to high impact publications.

3.2 User meetings

The three TA coordinators contribute to the ~monthly PMC meetings where the organisation of TA calls and implementation of TA's visits are always key issues for the agenda. TA board members also communicate by Skype and if required to resolve a specific issue by bi-lateral means (e-mail and telephone). Leaders of JRA-3 are also involved in bi-lateral and group Skype meetings to review progress. The TA-JRA coordinator (Davies) has physically visited the Open University team twice to discuss progress and will visit Nancy to discuss and review progress of the application of high resistance amplifier systems to the secondary ionisation mass spectrometers in September.

4. JRA 3 Progress Report

Although not a required deliverable, a summary of progress made under JRA 3 is made below. JRA 3 has two main aims; i) improving sample handling and preparation of ultra-small samples for destructive and non-destructive analysis; ii) refining methods to develop and apply high resistance amplifiers to mass spectrometric analysis (10^{12} & 10^{13} Ohm).

i) Sample handling-preparation-characterisation

Dr Epifanio Vaccarro has been appointed in March 2016 to undertake the optimisation of sample handling and characterisation methods at the British Museum. Dr Vaccarro has recently been offered a permanent position and so will leave the project earlier than anticipated. Prof Sara Russell will complete the work herself as it is not viable to appoint and train someone for only 1-2 months' work.

The work undertaken so far is designed to validate that sample characterisation is possible using non or minimally invasive preparation techniques. An amorphous standard has been created with the same composition as carbonaceous chondrite amorphous matrix to use as a standard. A series of key meteorites have been selected to validate the techniques (Colony, Kota Kota and NWA 8276). X-ray diffraction measurements of prepared (powdered) and unprepared rock chips of these samples have been compared. Secondary electron microscope maps have been produced to compare unprepared chips vs. polished sections of the meteorites. Further work planned for the end of 2016 will finalise the SEM studies and incorporate CT scanning and produce recommendations of the best approaches to be followed for sample characterisation using non or minimally invasive preparation techniques.

The VU team have further developed an electron microprobe technique for the analysis of unpolished mineral grains. Initial results of the technique were presented at a leading international conference (Koornneef et al., 2016) and results are being incorporated into a manuscript that will be submitted before the end of the year.

ii) Isotopic analysis of ultra-small samples

Dr Janne Koornneef has been employed at VUA to optimise techniques using thermal ionisation mass spectrometry and multi-collector mass spectrometry. Application of the techniques set up so far has resulted in contributions to 2 publications (Klaver et al. 2016 and Reinhard et al., 2016). Ongoing work is optimising sub nanogram Pb isotope analysis and in situ laser ablation Hf isotope analysis. Results from the JRA development work for TA3 have resulted in a presentation at a leading international conference of (Koornneef et al 2016). Developments have yet to be fully completed but there is active collaboration between VUA and Nancy with sample exchange and bilateral visits (next in September).

CRPG Nancy will appoint Dr David Madre for 12 months to conduct further development and testing of 10^{12} Ohm Faraday collector systems manufactured by industrial partner CAMECA and fitted to secondary ionisation mass spectrometers (SIMS). An initial system was tested within the Europlanet framework in early 2016 and based on work carried out at CRPG the hardware was redesigned. A major goal of the work of Dr Madre will be the characterisation of reference materials for isotopic ratio determination by SIMS; specifically C & O isotopes on Carbonate, S isotopes on sulphide and sulphate, O isotopes on clinopyroxene and feldspar. These reference materials will be used by the Europlanet community as well as becoming international reference material. The SIMS work is at a more preliminary stage than the TIMS applications and hence as yet there have been no presentation of data at public meetings.

The Open University (OU) generated additional funding to appoint a post-doctoral research fellow (PDRF) for a total of five years to work with the NanoSIMS. The TA 3 project would have been a work package in year 1. At the last minute the number one candidate withdrew. A new candidate is therefore being sort and a new advert has been placed and an appointment is expected before the end of 2016. The OU is working in close collaboration with CRPG and CAMECA on the project.

References arising from JRA 3:

Reinhard, A.A., Jackson, M.G., Harvey, J., Brown, C., Koornneef, J.M. (2016). Extreme differences in $^{87}\text{Sr}/^{86}\text{Sr}$ between Samoan lavas and the magmatic olivines they host: Evidence for highly heterogeneous $^{87}\text{Sr}/^{86}\text{Sr}$ in the magmatic plumbing system sourcing a single lava. *Chemical Geology*, 439, 120–131.

Klaver M., Davies, G.R. & Vroon, P. Z. (2016). Sub-slab mantle of African provenance infiltrating the Aegean mantle wedge. *Geology*, 44, 367-370.

Koornneef J.M., Gress M.U., Harris J.W. & Davies G.R. (2016). Archaean Diamond Growth beneath Venetia Established by Sm-Nd Systematics of Individual Garnet Inclusions. Proceeding of the 26th International Goldschmidt conference (geochemistry), Yokohama, Japan. [05b/10:00/We](#).

5. Appendix

Project No.	Name	Infrastructure short name	Installation ID	Installation Short name	Home Institution	Legal Status	Nationality	Scientific background
15-EPN-001	Barbara Cavalazzi	DAFS	TA3-4	HS50L	Università di Bologna	UNI	Italian	Earth Sciences & Environment
15-EPN-003	Jacopo Taddeucci	DPSF	TA2-3	PEF				
15-EPN-004	Kai Finster	DPSF	TA2-2	IMRF	Aarhus University		German	Life Sciences & Biotech
15-EPN-011	Barbara Cavalazzi	DPSF	TA2-2	IMRF				
15-EPN-012	Lisseth Gavilan	PFA	TA1-4	Tirez Lake	Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS)		Peru	Physics
15-EPN-013	Viviane Bout-Roumazeille	DSAF	TA3-1	GGIF				
15-EPN-020	Clémence Herny	DPSF	TA2-6	LMC	Université de Nantes	UNI	French	Earth Sciences & Environment
15-EPN-023	Francesca Esposito	DPSF	TA2-3	PEF				
15-EPN-026	Antoine Pommerol	DPSF	TA2-3	PEF				
15-EPN-027	Ashley King	DPSF	TA2-1	PEL	Natural History Museum	RES	British	Earth Sciences & Environment
15-EPN-029	Leuko Stefan	DPSF	TA2-2	IMRF	German Aerospace Center (DLR e.V.)		Austrian	Earth Sciences & Environment
15-EPN-039	David Cullen	PFA	TA1-3	Iceland	Cranfield University	UNI	British	Life Sciences & Biotech
15-EPN-044	Petra Schwendner	DPSF	TA2-2	IMRF				
15-EPN-046	Dennis Reiss	PFA	TA1-2	Ibn Battuta	Westfälische Wilhelms-Universität		German	