Programme: What next for space resource utilisation?

Day 1 – October 10th				
Time	**Duration**	**Presenter**	**Subject**	**Affiliation**
08:15	00:55	Registration		
09:10	00:15	J. Carpenter	Welcome, introduction remarks, workshop objectives	ESA
09:25	00:15	D. Parker	Keynote speaker	ESA
09:40	00:10	J. Mousel	Outcome Space Mining Submit	LSA
09:50	00:10	C. Neal	Outcome US ISRU Workshop	U. Notre Dame
10:00	00:10	J. Alves	ISRU Gap Analysis	ISECG
10:10	00:10	J. Carpenter	ESA Strategy	ESA
10:20	00:10	G. Sanders	NASA Strategy	NASA
10:30	00:10	B. Hufenbach & M. Link	Agency updates	ESA & Luxembourg Space Office
10:40	00:10	Q&A – Strategic goals		
10:50	00:10	D. Inocente	Space Resources Vision	SOM
11:00	00:30	Coffee Break		
Economics of Space resources			Chairs: M. Link, A. Sommariva	
11:30	00:15	M. Link	Overview economics of Space resources	LSA
11:45	00:10	D. Britt	Economics and Exploration: historical perspective on our new age of exploration	UCF
11:55	00:10	K. Acierno & C. Espejel	Transportation enabling ISRU & SRU value chain	ispace
12:05	00:05	N. Bennett	GTO as a market for lunar ISRU propellant	Australian Center for Space Engineering Research
12:10	00:05	A. Sommariva	The economics of Moon Mining	SDA Bocconi School of Management
12:15	00:05	J.K. Schingler	Open Architecture	Open Lunar Foundation
12:20	00:05	S. Drake	Space Resource Business Models: from concepts to funding	Space Ventures Investors Ltd
12:25	00:05	K. Kaysin	Space technology contests as an approach to establishing sustainable business models	RVC
12:30	00:05	P.J. Blount	The Role of coordination and cooperation in building a Global Space Resources Regime	U. de Luxembourg
12:35	00:40	**Interactive session, all last speakers on stage: What is the priority in the next 3-5 years?**		

Programme: What next for space resource utilisation?

13:15	01:00	Lunch		
Prospecting		Chairs: C. van der Bogert, J. Carpenter		
14:15	00:15	C. van der Bogert	Overview volatiles, and lunar regions of interest	U. Münster
14:30	00:05	G. Patterson	Water ice on the Moon: What we know versus what we still have to learn	JHUAPL
14:35	00:05	R. Fisackerly	PROSPECT: Status and Development	ESA
14:40	00:05	J. Prinetto	A compact surface sampling mechanism with integrated bio-analyzer	PoliMi
14:45	00:05	A. Calzada Diaz	Polar Ice Explorer: ispace's first resource exploration mission	ispace
14:50	00:05	P. Harkness	Autonomous drilling and sampling technologies	U. Glasgow
14:55	00:05	M. Sabbatini	Prospecting Technologies – Maximising the interaction of aerial and ground robots for autonomous exploration tasks	ESA
15:00	00:05	M. Hunter-Scullion	Asteroid Resource Prospecting using pre-existing technologies	Asteroid Mining Corporation Ltd.
15:05	00:40	**Interactive session, all last speakers on stage: What is the priority in the next 3-5 years?**		
15:45	00:10	Group Photo		
15:55	00:25	Coffee Break		
Regolith Excavation and Processing		Chairs: K. Hadler. M. Sperl		
16:20	00:15	K. Hadler	Overview + topical team	ICL
16:35	00:05	G. Just	Critical Review of Regolith Excavation Techniques for Lunar ISRU and Suggested Experimental Parameters	U. of Manchester
16:40	00:05	H. Wotruba	Mineral Processing in Space	RWTH Aachen
16:45	00:05	C. Rossi	Robominers: from deep underground to deep space	UP Madrid
16:50	00:05	R. Aked	Development of key technologies towards space resources utilisation	SAS
16:55	00:05	P. Hartlieb	Alternative fragmentation concepts for possible space mining applications	Montanuniversitaet Leoben
17:00	00:05	R. Bamford	The case for plasma drilling technology	RAL Space
17:05	00:05	N. Vandewalle	The physics of granular materials, a key ingredient for space exploration and exploitation	U. de Liege
17:10	00:05	M. Adachi	Mitigation and Transporting Technologies for Regolith Using Electrostatic, Magnetic, and Vibrational Forces	DLR Cologne

Programme: What next for space resource utilisation?

17:15	00:05	R. González-Cinca	What is the right power supply architecture for a mission on the Moon?	UPC Barcelona
17:20	00:05	C. Lindley	Resource Modelling Methods for Small Solar System Bodies	CSIRO
17:25	00:05	A. Wedler	DLR Robotics to be used in ISRU applications	DLR Munich
17:30	00:40	**Interactive session, all last speakers on stage: What needs to be done? What is the priority in the next 3-5 years?**		
18:10	00:10	**Wrap-up discussions and conclusion of the 1st day**		
18:20 - 19:00	Networking reception			

Programme: What next for space resource utilisation?

Day 2 – October 11th

08:30	00:10	**Introduction**		
Oxygen and Water from Regolith and Polar Volatiles			Chairs: A. Meurisse, B. Lomax	
08:40	00:15	A. Meurisse	Overview Water and Oxygen extraction	ESA
08:55	00:10	D. Binns	Summary of the ESA ISRU Demonstration Campaign	ESA
09:05	00:05	J. Brisset	In-Situ Water Extraction on the Lunar Surface	UCF
09:10	00:05	L. Schütler	In-Situ Extraction, Separation, Purification and Usage of Oxygen and Water	ESA
09:15	00:05	B. Baratte	H2O to O2 and H2 production in Space for Life and Energy Support	Air Liquide
09:20	00:05	B. Lomax	The Metalysis-FFC process: oxygen and metals from lunar regolith	U. Glasgow
09:25	00:05	A. Dietz	Electrowinning of metals and oxygen from moon regolith	Fraunhofer IST
09:30	00:05	T. Denk	Terrestrial Demonstrator for Hydrogen Reduction of Lunar Regolith with Highly Concentrated Solar Radiation	Ciemat-PSA
09:35	00:05	A. Boiron	Hydrogen Peroxide use on the Moon	Nammo
09:40	00:05	S. Vijendran	Mars In-situ Resource Utilisation: Where are the synergies and differences with lunar applications?	ESA
09:45	00:40	**Interactive session, all last speakers on stage: What needs to be done? What is the priority in the next 3-5 years?**		
10:25	00:30	Coffee Break		
Materials and Construction			Chairs: A. Makaya, S. Linke	
10:55	00:15	A. Makaya	Overview Materials and Construction	ESA
11:10	00:05	S. Linke	Progress in Regolith Simulant Development and related ISRU Technologies	TU Braunschweig
11:15	00:05	P. Metzger	The First Use of Space Resources: Constructing Landing Pads from Lunar Materials	UCF
11:20	00:05	Y. Akisheva	Strategy of Regolith Utilisation as Radiation Protection of Human Habitats for Long Duration Expeditions on the Moon and Mars	ISAE-Supaero
11:25	00:05	M. Arnhof	Lunar regolith geopolymer reinforced with basalt fibre for construction on the Moon	ESA
11:30	00:05	M. Peroni	Active Shielding For Moon Base City	Marco Peroni Ingegneria
11:35	00:05	J. van Oorschot	Developing a power infrastructure on the Moon by first developing it on Earth	Maana Electric

Programme: What next for space resource utilisation?

11:40	00:05	S. Lim	Microwave heating as a fabrication method for an extra-terrestrial construction process	Open University
11:45	00:05	A. Niecke	MoonFibre - Fibres from Lunar Regolith	RWTH Aachen
11:50	00:40	**Interactive session, all last speakers on stage: What needs to be done? What is the priority in the next 3-5 years?**		
12:30	00:30	Wrap-up & Closure		
13:00	Close			

Posters		
Name	**Affiliation**	**Title**
R. Trimlett	The Royal Brompton & Harefield NHS Foundation Trust	Additive Manufacturing, Artificial Heart Support or Robotic Surgery
M. Zorzano	National Institute of Aerospace Technology	Photocatalytic chemistry in space for ISRU
K. Kanawka	Blue Dot Solutions	3D printing - small 'building blocks' for exploration
P. Harkness	University of Glasgow	Autonomous drilling and sampling technologies
A. Wedler	DLR Robotic	DLR Robotics to be used in ISRU applications
F. Koch	Orbit Recycling Initiative	The underestimated space resource: space debris
C. Lindley	Commonwealth Scientific and Industrial Research Organisaiton (CSIRO)	Resource Modelling Methods for Small Solar System Bodies
R. Anyszka	University of Twente	How to design rubber materials withstanding Martian environment?
R. Velho	University of Warwick	Medical resource limitations for human space flight - lessons learnt from terrestrial space analogue missions
D. Fekede	Dire Dawa University	Dynamics of Interplanetary Magnetic Field in Space weather
E. Rabadan Santana	University of Luxembourg	Steam Propulsion and Simulation Environment Technologies for ISRU and Prospecting Missions
M. Lavagna	Politecnico di Milano	Towards Oxygen extraction from Moon regolith: the ground tests main achievements
S. Govindaraj	Space Applications Services	PRO-ACT: Planetary Robots Deployed for Assembly and Construction of Future Lunar ISRU and Supporting Infrastructures
A. Niecke	RWTH Aachen University	MoonFibre - Fibres from Lunar Regolith
J. Rasera	Imperial College London & ispace Europe SA	The electrostatic beneficiation of lunar regolith
T. McNeilly	Ötzibrew	Innovative Applications for the Use of Mushrooms in Space
N. Bowles	University of Oxford	The Lunar Trailblazer, a small satellite for remote sensing of lunar water and surface composition

F. Prenafeta-Boldú	Institute of Agrifood Research and Technology (IRTA)	Fungal melanin, an overlooked organic material for innovative applications in space technology?
A. Cassaro	University of Tuscia,	Towards lunar exploration: Lessons from terrestrial organisms and their journey in space
S. Sheridan	The Open University	Volatile characterisation instruments of ISRU
M. Faber	ESA	Production of high-fidelity "homebrew" regolith simulants for reliable ISRU process demonstration
C. Espejel	ispace	SRU Value Chain and Reporting of Space Resources and Space Reserves
R. McCandless	Signaluna Ltd	SphereX Robotic Platform for Exploration and Resource Prospecting In Low Gravity Environments
D. Karl	Universitaet Berlin,	Wet-processing and sintering of ceramics from Martian soil simulants using slip casting or Additive Manufacturing for in-situ resource utilization on Mars
L. Rabagliati	Politecnico di Torino	Modular Lunar Facility for In Situ Propellant Production
M. Sperl	Institute of Materials Physics	From Small Grains to Big Risks: Process Engineering in Unknown Environments
M. Giuliani	Politecnico di Torino	Optimal orbit selection for refuelling operations in cislunar space
D. Lucsanyi	Puli Space Technologies Ltd. /	Simulations and analysis of the lunar surface radiation, dusty plasma and thermal environments
J. W. Schroeder	CisLunar Industries S.A.	Recycling Space Debris: Utilizing the Most Readily Available Space Resource
G. Schmidt	NASA	SSERVI: Building scientific understanding for ISRU
F. Venditti	OHB Italia	Oxygen extraction from lunar regolith
D. Cullen	Cranfield University	Towards CubeSat-compatible payloads for early in situ demonstration / de-risking of key ISRU steps on NEO's, Moon and Mars
P. Vyshnav	F-drones	Vision-based Navigation of Autonomous Mobile Robots for Lunar Resource Prospecting
T. Pacher	Puli Space Technologies ltd	Providing surface mobility on the Moon
A. Dempster	UNSW	The Wilde Project
J. M. Trigo-Rodriguez	Institute of Space Sciences (CSIC-IEEC)	Water, precious metals and rare Earths in primitive chondritic asteroids

Y. Pennec	Air Liquide Advanced Technologies	Purification Technologies for Lunar Oxygen Extraction
H. Broughton	Hugh Broughton Architects	Antarctic Research Stations: Extreme Architecture on Earth as precursors for Architecture in Space
M. Dudziak	The TETRAD Institutes	Project ASTRIC and Project TETHYS
J. Biswas	Technical University of Munich	The Lunar Volatiles Scout for in-situ volatiles extraction and analysis"
S. Ben Hamida	EPFL	Sustainable Space Logistics
C. Waldvogel	Spherene	The Moon Fountain