ASTRA PROGRAMME

Monday 2019.05.27

08:15	**Registration**			
09:10	**Welcome and Introduction**			**J. Gavira**
	Programmatics (1)		**Chair:**	**J Gavira**
09:20	0	G. Visentin	AI and Space robotics at ESA 2019	ESA
09:45	1	Philippe Schoonejans	Lunar Exploration at ESA	ESA
10:10	2	Ludovic Duvet	Mars Exploration at ESA	ESA
10:35	61	Bernd Sommer	Automation and Robotics in the German Space Program	DLR
11:00	Coffee break			

	(2a)	Planetary Mobility	Chair: M. van Winnendael	
11:20	4	Stylianos Skevakis	Energetics impact from the use of flexible and adaptable stiffness wheels on lunar and planetary rovers	Htr
11:45	9	Mikhail Malenkov	New Technical Solutions For Increase Of Quantity And Quality Of Scientific Researches With The Help Of Planetary Rovers	STC "ROCAD" Co
12:10	16	Moritz Nitz	Development And Operative Performance Analyses Of The Modular Rover Chassis Platform (MRCP)	University Of Stuttgart / Institute Of Space Systems
12:35	49	Serguei Matrossov	Steerable Platforms For Robotics And Space	RCL, Rover Company Ltd.

	(2b)	Orbital Missions	Chair: B. Sommer	
	7	Christopher Burgess	In-Flight Demonstration of an Active Debris Removal Harpoon Capture System	Airbus
	19	Angadh Nanjangud	Robotic Architectures for the On-Orbit Assembly of Large Space Telescopes	Surrey Space Centre
	46	Pierre Letier	MOSAR: Modular Spacecraft Assembly and Reconfiguration Demonstrator	Space Applications Services
	52	Maximo A. Roa	In-space robotic assembly of large telescopes	DLR - German Aerospace Center

	(2c)	Spacecraft Autonomy	Chair: K. Wormnes	
	33	Simone Fratini	On Board Autonomous Operations for OPS-SAT	ESA-ESOC
	37	Margherita Piccinin	Smart Autonomous Imaging Plan For Small Bodies Efficient Mapping	Politecnico di Milano
	39	Stefano Silvestrini	Model-Based Reinforcement Learning for Distributed Path Planning	Politecnico Di Milano

13:00	Lunch break			

	(3a)	Mobility in low gravity	Chair: M. Zwick	
14:10	15	Mr. Jean Bertrand	Roving on Phobos: challenges of the MMX Rover for space robotics	Cnes
14:35	21	Daniela Kapp	Attidtude and anti-bouncing control to enhance the movements capabilities of MASCOT-like landers	German Aerospace Center (DLR)
15:00	63	Hendrik Kolvenbach	SpaceBok	ETHz
15:25	65	Shanker Krishnamoorthy	Advancement of a Robotic Testbed for Floating- Dynamics Simulation	ESA

	(3b)	Orbital Robotic test facilities	Chair: K. Wormnes	
	6	Miro Voellmy	Design of a low-cost spherical air-bearing satellite simulator	Eth Zurich
	10	Peter Steele	On-Ground Validation of a Large Active Debris Removal Harpoon	Airbus
	28	Atheel Redah	Robotic Testing Platform for Autonomous Rendezvous and Docking of Floating Vehicles	University Of Wuerzburg
	40	Stefano Silvestrini	DANCE: Design and Characterization of 5 DOF Facility For relative GNC	Politecnico Di Milano

	(3c)	Robotics Frameworks 1	Chair: G. Visentin	
	11	Miguel Muñoz Arancón	ESROCOS: Development and Validation of a Space Robotics Framework	Gmv
	17	Malte Wirkus	Development of a Control Software for a Planetary Exploration Robot with ESROCOS	DFKI GmbH
	23	Jorge Ocón	Testing autonomous robots: a discussion on performances obtained in the ERGO field tests	Gmv
	47	Thomas Krueger	Introduction of a toolchain of state of the art tools for directly transition from developments to field deployment on the ISS	ESA

15:50	Coffee break			

	(4a)	Motion Planning	Chair: M. Delpech	
16:10	8	Carlos Pérez Del Pulgar	Coupled path and motion planning for a rover-manipulator system	University Of Malaga
16:35	12	Mr. Piotr Weclewski	Capabilities of Long Range Autonomous Multi-Mode Rover Navigation System - ERGO Field Trials and Planned Evolution	Airbus Defence and Space Ltd.
17:00	13	Arthur Scharf	Autonomous Scout Rover for Nuclear Decommissioning: Adapting the ExoMars Rover Guidance, Navigation and Control Algorithms for a Terrestrial Application	Airbus Defence And Space Ltd
17:25	20	Martin Azkarate	Autonomous Navigation GNC Architecture for SFR with Adaptive SLAM and Reactive Hazard Detection	ESA-ESTEC

	(4b)	Planetary Robots testing	Chair: M. Zwick	
	30	Fabian Buse	Fully automated single wheel testing with the DLR Terramechanics Robotics Locomotion Lab (TROLL)	German Aerospace Center (DLR)
	31	Philipp Oettershagen	Investigation of specific aspect of wheel-terrain interaction using advanced single wheel test facility	Ruag Space
	35	Elie Allouis	ExoFiT: ExoMars-like rover and science operations simulation through field-trials.	Airbus
	68	Jan Novotny	Gravity Compensation Device for Rovers	TEC-MMA

	(4c)	Robotics Frameworks 2	Chair: L. Joudrier	
	34	Shashank Govindaraj	Data Fusion Framework for Planetary and Orbital Robotic Applications	Space Applications Services NV/SA
	3	Gerhard Paar	MINERVA: a 3D GIS and Visual Analysis Framework	JOANNEUM RESEARCH Forschungsgesellschaft GmbH
	5	Sebastian Martin	The Surface Operations Framework - transitioning from early analogue experiments to future lunar missions.	Esa / Esoc

Tuesday 2019.05.28

	Plenary talk		**Chair: G. Visentin**	
09:00	62	Armin Wedler	Insides into the robotic exploration activities in the	DLR
09:30	Logistic break			

	(5a)	**Planetary Telerobotics**	**Chair: S. Aziz**	
09:40	48	Thomas Krueger	How to design a rover cockpit for operation onboard the ISS	ESA
10:05	27	Paweł Wittels	RaCER as Reliable Training Ground for the Human Enabled Robotic Architecture and Capability for Lunar Exploration and Science (HERACLES) Missions	PIAP Space
10:30	66	Neil Y. Lii	Unifying command modalities to achieve a holistic approach to effective orbit-to-surface telerobotic team operation	DLR
10:55	38	Tristan Schnell	Interactive visualization of robot state with Augmented Reality and Virtual Reality	FZI Research Center for Information Technology
11:15	Coffee break			

	(6a)	**Planetary Perception and Navigation**	**Chair: M. Delpech**	
11:35	36	Irene Sanz Nieto	Simplistic model-based wheeled robot detection and tracking with full pose estimation	Space Applications Services nv/sa
12:00	43	Helia Sharif	Fusion of multimodal imaging techniques towards autonomous navigation	DLR & Uni. Bremen
12:25	55	Andrea De Maio	Pose management for planetary rovers	LAAS-CNRS
12:50	60	Marcos Avilés	Autonomous Navigation for Long Range Traverses	GMV
13:15	**Lunch break**			

	Plenary talk		**Chair G. Visentin**	
14:25	55	Simon Lacroix	The Erfoud dataset: a comprehensive multi-camera and Lidar data collection for planetary exploration	LAAS-CNRS
14:55	Logistic break			

	(7a)	**Mars Sample Return**	**Chair: M. Zwick**	
15:05	14	Anja Frey	ACTS - Autonomous Cache Transfer System – End Effector design and Testing	AVS Added Value Solutions UK Ltd
15:30	66	John Vrublevskis	Description of European Space Agency (ESA) Technology Development for Mars Returned Sample Handling (MRSH)	TAS-UK
15:55	22	Mateusz Malinowski	Hardware Accelerated Visual Localisation For Next Generation Mars Rovers	Scisys Uk Ltd
16:20	41	Gianluca Cerilli	Visual servoing for sample tube detection and pick-up on Mars	Sapienza Università di Roma
16:45	Coffee break			

	(5b)	**Orbital Robotics technologies**	**Chair: D. Nölke**	
	18	Nikos Mavrakis	Visually Guided Robot Grasping of a Spacecraft's Apogee Kick Motor	University Of Surrey
	50	Monica Ekal	Combining Excitation Trajectories and Trajectory Optimization: Real-time Planning for Information Gain	Massachusetts Institute Of Technology
	44	Michèle Lavagna	Experimental Validation Of Vision-Based Algorithms For In-Orbit Relative Navigation	Politecnico Di Milano
		Paweł Wittels	TesVAC –Description of an MGSE dedicated to testing of grasping and docking/berthing mechanisms in thermal-vacuum conditions.	PIAP Space

	(6b)	**Robotic Hardware**	**Chair: M. van Winnendael**	
	32	Pablo Sánchez De Rojas	Implementation of adaptive motion planning in FPGA-based reconfigurable robot control architecture	Thales Alenia Space
	59	Aron Kisdi	Design of SpaceFOM compliant model-based HLA distributed simulation architecture for validation and verification of autonomous systems including hardware-in-loop tests	GMV

	(7b)	**Robotics for ISRU**	**Chair: R. Bertacin**	
	24	Eric Halbach	Autonomous Area Clearing with a Robotic Wheel Loader	Tampere University
	29	Shashank Govindaraj	PRO-ACT: Planetary Robots Deployed for Assembly and Construction of Future Lunar ISRU and Supporting Infrastructures	Space Applications Services NV/SA
	42	Suzanna Lucarotti	A Self Reconfigurable Undulating Grasper For Asteroid Mining	University Of Surrey
	45	Jeremi Gancet	LUVMI and LUVMI-X: LUnar Volatiles Mobile Instrumentation concept and eXtension	Space Applications Services NV/SA

	(5c)	**ESROCOS Hackathon 1**	**Chair M. Azkarate**	
	E1	Malte Wirkus	ESROCOS basics and Workflow - Planetary Application	DFKI GmbH
	E2	Herman Bruyninckx	Robot Modelling	KU Leuven
	E3	Miguel Muñoz	PUS and Simulator - Orbital Application	GMV

	(6c)	**ESROCOS Hackathon 2**	**Chair M. Azkarate**	
	E4	Maxime Perrotin	Future Developments for TASTE	ESA
	E5	Miguel Muñoz	Closing Remarks - Handover of ESROCOS Image	GMV
	E6	All	Discussion	All

	(7c)	**AI in perception**	**Chair: L. Joudrier**	
	26	Spyridon Karachalios	Novelty Or Anomaly Hunter| Towards Flight Ready Autonomous Science Using State Of The Art Machine & Deep Learning	SCISYS
	51	Evangelos Boukas	Are CNNs good for novelty detection?	Technical University of Denmark