

Space Traffic Management and Resilient Space Environment

Organized by: DLR, DFKI & University of Strathclyde

	13.09.2021	14.09.2021	15.09.2021	16.09.2021	17.09.2021
TIME (CEST)	Space environment management	Modelling & risk analysis	Mitigation strategies & challenges	Active debris removal & on-orbit servicing	Future missions & trends
8:00 - 8:45	Daily organisation meeting / video conf test for presenters	Daily organisation meeting / video conf test for presenters	Daily organisation meeting / video conf test for presenters	Daily organisation meeting / video conf test for presenters	Daily organisation meeting / video conf test for presenters
8:45 - 9:00	OPENING	OPENING	OPENING	OPENING	OPENING
	<i>Session 1.1</i>	<i>Session 2.1</i>	<i>Session 3.1</i>	<i>Session 4.1</i>	<i>Session 5.1</i>
9:00 - 10:00	Keynote 1.1 Dr. Klaus Merz ESA/ESOC Space traffic in a congested environment – ESA activities in the areas of modelling, mitigation and operational approaches [Space debris detection and characterization]	Keynote 2.1 Dolado Perez Juan Carlos, CNES Key considerations to guarantee safety of operations in space [Space situational awareness]	Keynote 3.1 Dr. Luisa Innocenti, ESA HQ ESA cleanspace: towards a cleaner and safer space environment [Space debris mitigation strategies]	Keynote 4.1 Gianfranco Visentin, ESA/ESTEC The H2020 PERASPERA programme, dealing with the challenges of in-Orbit Servicing, Assembly and Manufacturing [On-orbit servicing & on-orbit manufacturing]	Keynote 5.1 Dr. Darren McKnight, LeoLabs Inc. The More Things Change... [Future missions & trends]
10:00 - 10:20	Emma Stevenson Universidad Politécnica de Madrid An Assessment of Machine Learning Techniques for Orbital Conjunction Screening [space situational awareness, space environment modelling and risk analysis]	Dr. Pooja Dutt ISRO Assessment of in-house re-entry prediction [space environment modelling and risk analysis, space debris mitigation strategies]	Edoardo Legnaro Aristotle University of Thessaloniki Academy of Athens Analytic Theory for Secular Lunisolar [space debris mitigation strategies, space environment modelling and risk analysis]	Dr. Stephane Estable / Airbus Defence and Space GmbH PERIOD – PERASPERA In-Orbit Demonstration Mission and System Definition [on-orbit servicing and on-orbit assembly of large structures, future missions]	Philipp Nieke University of Auckland Early-stage research into the environmental impact of Aotearoa New Zealand’s space sector [constellations and future trends in the context of space debris and space traffic management]
10:20 - 10:40	Daniel Saez Bo / Dr. Diego Escobar GMV Aerospace and Defence Autonomous Collision Avoidance System: Risk anticipation using Machine Learning techniques and enhanced Collision Avoidance Manoeuvres strategies [space situational awareness, space environment modelling and risk analysis]	Fabio Morgado Aerospace Centre of Excellence University of Strathclyde Impact of Anisotropic Mesh Adaptation on the Aerothermodynamics of Atmospheric Re-entry of Proximal Bodies [space environment modelling and risk analysis, other]	Sai Abhishek Peddakotla Aerospace Center of Excellence University of Strathclyde High-fidelity Solar Panel Fragmentation Model for the Atmospheric Re-entry of Satellites Using a Novel Peridynamics Methodology [space debris mitigation strategies, space environment modelling and risk analysis]	Wiebke Brinkmann DFKI GmbH Robotics Innovation Center Preliminary definition of a Standard Interconnect Benchmark for On-Orbit Servicing Demonstrator [on-orbit servicing and on-orbit assembly of large structures, future missions]	Dr. Francesca Letizia European Space Agency Debris risk assessment for space sustainability [Large constellations and future trends]
10:40 - 11:00	Sebastian Diaz Riofrio University of Strathclyde Exploration of different antennas for a CubeSat-based solution for the purpose of space surveillance [space situational awareness]	Roberto Paoli UAIC Investigations on the solar radiation pressure semi-secular resonances for space debris [space environment modelling and risk analysis, space debris mitigation strategies]	Dr. Mioara Joldes LAAS-CNRS Multi-risk collision avoidance via nonconvex quadratic optimization [space debris mitigation strategies, Guidance, navigation and control]	Dr. Joaquin Estremera GMV Multi-arm robotic manipulator for on-orbit assembly and servicing [on-orbit servicing and on-orbit assembly of large structures, on-board autonomy]	Bulbul Mukherjee Indian Space Research Organisation Future Challenges of Space Operations in the Presence of Large Constellations in Low Earth Orbit [large constellations and future trends in the context of space debris and space traffic management, other]
11:00 - 11:20	Break	Break	Break	Break	Break
	<i>Session 1.2</i>	<i>Session 2.2</i>	<i>Session 3.2</i>	<i>Session 4.2</i>	<i>Session 5.2</i>
11:20 - 11:40	Dr. Davide Amato Department of Aeronautics Imperial College London Frequency domain analysis of the mean and oscillating trajectories of LAGEOS-1 [space situational awareness, space debris detection and characterization]	Eduardo Maria Polli Politecnico di Milano Statistical Analysis of the Environmental Impact of Satellite Constellations [Space environment modelling and risk analysis, space situational awareness]	Ankita Agarwal ISTRAC-ISRO Indian Space Research Organisation Post Mission De-orbiting of Cartosat-2 [Space debris mitigation strategies, other]	Liam Pieters TU Delft Simulating arbitrary interactions between small-scale space debris and space-based laser system [active debris removal, future missions]	Lasse Maywald TU Braunschweig Region of Attraction Estimation for Robotic Spacecraft [Guidance, navigation and control]

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11:40 - 12:00	Wolfgang Riede DLR Institute of Technical Physics High-end laser optical monitoring technology for LEO space environment [Space debris detection and characterization, space situational awareness]	Dennis Weber European Space Agency Statistical Analysis of Conjunctions in the Low Earth Orbit [Space environment modelling and risk analysis]	Maarten Schild TU Delft Sun-synchronous Spacecraft Compliance with International Space Debris Guidelines [Large constellations and future trends in the context of space debris and space traffic management]	Shubham Vyas DFKI GmbH Stabilization of Post-Capture Detumble Trajectories for Controller Composition Category: Active debris removal	Dr. Ksenia Klionovska DLR German Space Operations Center Close Range Approach and Fly-around with LIDAR in On-Orbit Servicing Missions [on-orbit servicing and on-orbit assembly of large structures, guidance, navigation and control]
12:00 - 12:20	Prof. Rafael Vazquez Universidad de Sevilla Escuela Tecnica Superior de Ingenieria Two Manoeuvre Detection Probability Metrics Based on Radar Measurements Validated with S3TSR Data [space situational awareness, other]	Luis Sanchez University of Strathclyde CASSANDRA: Computational Agent for Space Situational Awareness and Debris Remediation Automation [Space environment modelling and risk analysis]	Joe Cassidy Aerofjet Rocketdyne Updated Approaches to Debris Mitigation Using Electric Propulsion [space debris mitigation strategies, other]	Liam Field University at Buffalo Effect of Tether Discretization on Target Attitude Debris Motion [active debris removal]	Eicke-Alexander Risse German Space Operations Center, DLR A robust navigation filter fusing delayed measurements from multiple sensors [guidance, navigation and control, on-board autonomy]
12:20 - 14:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
	<i>Session 1.3</i>	<i>Session 2.3</i>	<i>Session 3.3</i>	<i>Session 4.3</i>	<i>Session 5.3</i>
14:00 - 15:00	Keynote 1.2 Florian Rems DLR The "Why" of Robotic On-Orbit Servicing [on-orbit servicing and on-orbit assembly of large structures]	Keynote 2.2 Dr. Alinda Mashiku, NASA/Goddard Space Flight Center NASA Spacecraft Conjunction Assessment and Collision Avoidance Best Practices: The History, Evolution and Opportunities [Space situational awareness]	Stardust Challenge- Asteroids	Stardust Challenge- Debris	Keynote 5.2 Mr. Toby Harris, Astroscale Holdings Inc. The End-of-Life Services by Astroscale demonstration (ELSA-d) mission [Future missions & trends]
15:00 - 15:20	Dr. Giulio Bau University of Pisa A generalization of the equinoctial orbital elements for improved uncertainty propagation of Earth's satellites [space situational awareness]	Hilaire Bizalion Share My Space Systematic TLE Data Improvement by Neural Network for Most Cataloged Resident Space Objects [guidance, navigation and control, space situational awareness]	Stardust Challenge- Asteroids	Stardust Challenge- Debris	Stefano Casini Delft University of Technology Hyperion Technologies Delft University of Technology Autonomous Line-of-Sight Navigation using Micro Star Trackers: a Sensitivity and Robustness Analysis [guidance, navigation and control, on-board autonomy]

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15:20 - 15:40	Ben Guthrie University of Southampton Improving Autonomous Guidance using Machine Learning Technologies [active debris removal, space debris detection and characterization]	Giacomo Curzi University of Bologna A linear analytic solution for spacecraft motion under tangential trust [guidance, navigation and control, space environment modelling and risk analysis]	Stardust Challenge- Asteroids	Stardust Challenge- Debris	Pelayo Penarroya Deimos Space S.L.U. CubeSat Landing Simulations on Small Bodies using Blender [guidance, navigation and control, future missions]
15:40 - 16:00	Dr. Andrew Wilson University of Strathclyde Life cycle engineering in the context of aerospace: Preliminary findings [other, Space environment modelling and risk analysis]	Mauricio Misquero University of Rome Tor Vergata Accuracy and efficiency in the propagation of highly eccentric orbits [Space environment modelling and risk analysis]	Stardust Challenge- Asteroids	Stardust Challenge- Debris	Karl Martin Kajak German Space Operations Center, DLR Implicit Orientation Learning for Close Range Visual Relative Space Navigation [Guidance, navigation and control, Active debris removal]
16:00-16:20	Break	Break	End	Break	Break
	<i>Session 1.4</i>	<i>Session 2.4</i>		<i>Session 4.4</i>	<i>Session 5.4</i>
16:20 - 16:40	Tudor Vartolomei University of Rome Tor Vergata Computing Proper Elements for Simulated Space Debris [Space debris detection and characterization]	Miles Lifson Massachusetts Institute of Technology Orbital slotting based on flower constellations and under the effects of the J2perturbation [Large constellations and future trends in the context of space debris and space traffic management]	Closed event Stardust-R Supervisory Board meeting (start 16:00)	Chen Zeng University at Buffalo Optimizing the Process of Net-Based Active Capture of Rotating Space Debris [active debris removal]	Dr. Óscar Rodríguez del Río Università di Pisa Generalization of an IOD method by Mossotti applied to space debris [other]
16:40 - 17:00	Dr. Shelia Neumann Independent consultant Environmental Life Cycle Assessment Base Case of U.S. Commercial Space Transportation Activities [Other, n.a.]	Prof. Aaron Boley The University of British Columbia Environmental Impacts Of Large Satellite Constellations [Large constellations and future trends in the context of space debris and space traffic management]	Closed event Stardust-R Supervisory Board meeting	Julian Hammerl University of Colorado Remote Electric Potential Sensing Considerations for the Electrostatic Tractor [active debris removal, guidance, navigation and control]	Dr. Pooja Dutt ISRO/VSSC Impact of Upcoming Large Satellite Constellations on Launch Vehicle Collision Avoidance [Large constellations and future trends in the context of space debris and space traffic management, Space environment modelling and risk analysis]
17:00 -17:20				Mr. Alberto Agueda Mate GMV Initial Steps towards a Future Approach to a European STM Capability in the EUSTM Project [Large constellations and future trends in the context of space debris and space traffic management, Space situational awareness]	Closing
End					

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18:00 - 19:00		<p>Evening event</p> <p>Dr. Andrew Wilson University of Strathclyde</p> <p>Public lecture V</p> <p>"Advanced Methods of Life Cycle Assessment for Space Systems" - Stardust-R</p> <p>Note: Will not be broadcasted on the official GWV-II video conference platform</p> <p>More information including a link to the broadcast platform</p> <p>http://www.stardust-network.eu/outreach/public-lecture-v-environmental-life-cycle-assessment-for-aerospace-applications/</p>			