

Space capacity allocation for the sustainability of space activities Workshop

Politecnico di Milano, 3-5 June 2026

3 June, Wednesday Room: Carassa Dadda (BL28)						
Start	End	Duration	Event type	Event description	Speaker	Institution
08:30	09:30	01:00		Registration		
09:30	12:15	02:45		Session 1: "Is Space debris an environmental problem?" chaired by Camilla Colombo and Alessandro Rossi		
09:30	09:45	00:15	Introduction	Official greetings	Alessandro Perego, Camilla Colombo	Politecnico di Milano
09:45	10:00	00:15	Introduction	Aim of the workshop	Camilla Colombo, Alessandro Rossi	
10:00	10:45	00:45	Keynote	Space debris as an environmental stressor: analogies and insights from Planetary Boundary-based absolute environmental sustainability assessment	Esther Sanyé-Mengual & Thibaut Maury	JRC & Directorate General DEFIS
10:45	11:15	00:30	Highlight	Towards a sustainable space environment, one technology at a time	Stijn Lemmens	European Space Agency
11:15	11:45	00:30	Highlight	NASA's Orbital Debris Modelling Activities and Risk from Small Debris	J.-C. Liou	NASA
11:45	12:15	00:30	Discussion	Discussions on similarities and differences with space debris	All	Politecnico di Milano, European Space Agency
12:15	13:30	01:15		Lunch		
13:00	13:30	00:30		COMPASS Coffee		
13:30	14:30	01:00		Session 2: "Challenges of space debris modelling" chaired by Emma Stevenson and J.-C. Liou		
				<i>Covered topics: Modelling of the long-term evolution of the space object population environment and challenges in the forecast of the future launch traffic and technology development scenarios.</i>		
13:30	13:45	00:15	Presentation	New modelling approaches for defining environment evolution scenarios	Lorenz Böttcher, Manuel Schubert; Carsten Wiedemann; Eric Schultheiß; Simona Silvestri	TU Braunschweig
13:45	14:00	00:15	Presentation	ESMILE: An Ensemble-Driven Particle-in-a-Box Model for Efficient Space Debris Scenario Exploration	Elisa Boccolari; Camilla Colombo; Francesco De Bortoli; Jan Kowalski; Stijn Lemmens; Marcin Miklewski; Andrea Nava; Patryk Niczke; Francisco Simarro; Luca Spazzacampagna; Emma Stevenson	Politecnico di Milano
14:00	14:15	00:15	Presentation	An Overview of Innovative Optical Observation Techniques Applied to Daytime and Cislunar Orbits and Real-Time Tracking	Matteo Rossetti; Andrea Ederle, Lorenzo Cimino; Lorenzo Mariani; Fabrizio Piergentili	Università La Sapienza
14:15	14:30	00:15	Presentation	Kessler Syndrome Analysis Via A Multi-Shell Macroscopic Model	Camilla Colombo; Francesco De Bortoli; Luca Di Gregorio; Martina Rusconi	Politecnico di Milano
14:30	14:45	00:15	Presentation	The MOCAT Ecosystem: An Overview of the MIT Orbital Capacity Assessment Tool Suite	Giovanni Lavezzi; Richard Linares	MIT
14:45	15:30	00:45		Session 3: Exercise "Space debris modelling workshop" chaired by Wiebke Retagne, Elisa Boccolari and Giovanni Lavezzi. Prepared by PoliMi and MIT		
14:45	14:55	00:10	Introduction	Explanation of the exercise on long term simulations	Elisa Boccolari; Camilla Colombo; Francesco De Bortoli; Wiebke Retagne	Politecnico di Milano
14:55	15:30	00:35	Discussion	Tackling and communicating uncertainties in space debris modelling	All, in groups	
15:30	16:00	00:30		Coffee break (sponsored by PoliMi GREEN SPECIES)		
16:00	17:30	01:30		Session 4: "How space debris mitigation can adapt to the space environment?" chaired by Stijn Lemmens and Ian Christensen		
				<i>Covered topics: Analysis on how mitigation guideline can adapt to the change in the launch trend and the increase of large constellations.</i>		
16:00	16:30	00:30	Highlight	GREEN SPECIES: Active control of the space debris population to define optimal mitigation policies to target a sustainable development of space activities	Camilla Colombo, Elisa Boccolari; Giacomo Borelli; Francesco De Bortoli; Achraf Mizmizi; Wiebke Retagne; Martina Rusconi	Politecnico di Milano
16:30	16:45	00:15	Presentation	A Tiered Approach to Space Debris Mitigation Policy	Dominick Bologna; Victor Cabrera; Gregory Henning; Marlon Sorge; Lily Wahleithner	The Aerospace Corporation
16:45	17:00	00:15	Presentation	Development of risk assessment tools at the University of Padova	Stefano Lopresti, Antonio Nicolino; Lorenzo Olivieri	Università di Padova
17:00	17:15	00:15	Presentation	Autonomous collision avoidance algorithms as enablers for space congestion management	Juan Luis Gonzalo, Eduardo Maria Polli; Camilla Colombo	Politecnico di Milano, Universidad Rey Juan Carlos
17:15	17:30	00:15	Presentation	Operational Long-Term Assessment of Periodic Satellite Conjunctions	Camilla Colombo; Achraf Mizmizi	Politecnico di Milano
17:30	17:45	00:15	Presentation	Space Debris Characterization Through Multiband Photometry	Alfredo Biagini	Osservatorio Astronomico di Palermo - OAPA
17:45	18:15	00:30	Discussion	Wrap-up on modelling and mitigations	All	
18:15	20:30	02:15		Opening buffet (sponsored by PoliMi GREEN SPECIES)		

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4 June, Thursday Room: L12 and L13 (B12)						
Start	End	Duration	Event type	Event description	Speaker	Institution
08:30	09:00	00:30		COMPASS Coffee		
09:00	10:45	01:45		Session 5: "How to assess the impact of space missions onto the space environment?" chaired by Francesco De Bortoli and Max Vasile		
				<i>Covered topics: Comparing indices to assess the impact of missions to the space debris environment.</i>		
09:00	09:30	00:30	Highlight	Space Debris Modelling and IADC Lessons Learned	Alessandro Rossi	IFAC-CNR
09:30	09:45	00:15	Presentation	The impact of large satellite constellations on astronomy	Piero Benvenuti	International Astronomical Union
09:45	10:00	00:15	Presentation	Real-time health monitoring for reliable satellite disposal	Enza Magaudo; Giulia De Innocentiis; Daniele Bellomi; Andrea Guzzo	Intella s.r.l.
10:00	10:15	00:15	Presentation	Estimation of the Avoidance Manoeuvre Operational Burden Caused by In-Orbit Fragmentation Events	Juan Felipe Cabrera, Daniel Lück; Achraf Mizmizi; Camilla Colombo	Politecnico di Milano
10:15	10:30	00:15	Presentation	Activities on space sustainability within the CNES Ecosystem	Francois Vinet	Centre national d'études spatiales
10:30	10:45	00:15	Presentation	Collision Avoidance Decision Making Based On Risk And Consequence Metrics	Juan Felipe Cabrera; Camilla Colombo; Eduardo Maria Polli; Diego Ramirez Rodríguez; Francisco Simarro; Eduardo Arias, Emma Stevenson	GMV
10:45	11:15	00:30		Coffee break (sponsored by PoliMi GREEN SPECIES)		
11:15	12:30	01:15		Session 6: "How to measure the space capacity?" chaired by Alessandro Rossi and Elisa Boccolari		
				<i>Covered topics: Measuring and defining thresholds for the overall space carrying capacity.</i>		
11:15	11:30	00:15	Presentation	SDM 6.0: A Modernized Evolutionary Framework for Assessing Long-Term Orbital Capacity and Mitigation Strategies	Xiaoran Yan; Alessandro Rossi; Giulia Schettino	Centro Nazionale delle Ricerche
11:30	11:45	00:15	Presentation	Advances in Modelling Space Capacity with THEMIS	Daniel Lück, Andrea Muciaccia; Juan Felipe Cabrera; Emma Stevenson; Francesca Letizia; Camilla Colombo	Politecnico di Milano
11:45	12:00	00:15	Presentation	The Criticality of Orbital Regions: from Local Effects to the Global Health of the Space Environment	Massimiliano Vasile; Yirui Wang	University of Strathclyde
12:00	12:15	00:15	Presentation	ADEPT as an Analysis Framework for Space Environment Sustainability Indices	Dominick Bologna; Victor Cabrera; Gregory Henning; Marlon Sorge; Lily Wahleithner	The Aerospace Corporation
12:15	12:30	00:15	Presentation	Fragmentation, Loss-of-control And Other Acute Space-based Hazards Score - FLASH - For Fragmentation Hazard Oriented Ground Based Observations	Zoé Medaric; Gabriel Laupré	Space Campus
12:30	14:00	01:30		Lunch		
13:30	14:00	00:30		COMPASS Coffee		
14:00	14:45	00:45		Session 7: Exercise "Space capacity workshop" chaired by Camilla Colombo and Stijn Lemmens. Prepared by PoliMi, INAF, ESA. What is a reference environment evolution scenario, how can we access its health?		
14:00	14:15	00:15	Presentation	Review of parameters influencing Orbital Carrying Capacity	Daniel Lück, Andrea Muciaccia; Martina Rusconi; Margherita Michahelles; Camilla Colombo	Politecnico di Milano
14:15	14:45	00:30	Discussion	What is a reference environment evolution scenario, how can we access its health?	All	
14:45	16:00	01:15		Session 8: Exercise "How technical mitigation actions can be translated in policies?" chaired by Martina Rusconi and Qian Shi. Prepared by SWF, PoliMi		
14:45	15:15	00:30	Highlight	Scenario-based modelling of debris mitigation strategies to support policy and operator decisions	Martina Rusconi; Qian Shi, Ian Christensen; Camilla Colombo; Peter Martinez	Secure World Foundation, Politecnico di Milano
15:15	15:40	00:25	Discussion	From Operations to Sustainability: What Should We Control in Space?	All	
15:40	16:00	00:20	Panel	Are the mitigations needed to achieve a sustainable environment evolution scenario achievable from an operational point of view?	Mark Sturza, Lorenzo Arona, Sam Diserens, Emmanuelle David, Carlo Del Rosario	Viasat, Safe Heavens, UK Civil Aviation Authority, EPFL, EUSPA
16:00	16:30	00:30		Coffee break (sponsored by PoliMi GREEN SPECIES)		
16:30	18:00	01:30		Session 9: "Space debris mitigation policies" chaired by Ian Christensen and Emma Stevenson		
				<i>Covered topics: Policy studies on space debris mitigations and applicability of capacity management strategies.</i>		
16:30	16:45	00:15	Presentation	Business-as-Usual and Orbital Debris Path	Aneli Bongers; José Luis Torres Chacón	Universidad de Málaga
16:45	17:00	00:15	Presentation	Space Debris Mitigation Policy in the Context of Deployment of Space Data Centres	Anna Hurova, Maryna Myklush	Space Chair, ENS-PSL
17:00	17:15	00:15	Presentation	From Policy Assumption to Practical Implementation: Reassessing PMD Policy through Economic Viability, Technology Readiness, and Risk Relevance, with an Illustrative Industry Case	Yasuhito Uto, Masakazu Koyanagi, Nobuo Yoshii, Fumika Itoyo	BULL Co., Ltd.
17:15	17:30	00:15	Presentation	Space Debris Mitigation Policies for Large Constellations: Licensing and Continuing Supervision as Tools of Space Capacity Management	Raoul Cardellini Leipertz	School of Advanced Defence Studies (CASD-SSU)
17:30	17:45	00:15	Presentation	Is Active Debris Removal Beneficial? An Environmental Risk Analysis with THEMIS 1.0	Martina Rusconi, Camilla Colombo; Stijn Lemmens; Francesca Letizia; Emma Stevenson	Politecnico di Milano
17:45	18:00	00:15	Presentation	Fostering Space Sustainability: Interdisciplinary Frameworks for Policy and Investment	Emmanuelle David, Angelina Frolova; Stephan Hellmich; Sebastian Villanueva; Xiao-Shan Yap	EPFL
18:00	18:15	00:15		Wrap-up on space capacity and integration with space traffic management	All	
19:30	21:30	02:00		Dinner (upon registration)		

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5 June, Friday Room: L12 and L13 (B12)						
Start	End	Duration	Event type	Event description	Speaker	Institution
08:30	09:00	00:30		COMPASS Coffee		
09:00	11:00	02:00		Session 10: Panel “Space debris and space capacity measures in the Europe space act and international cooperation” chaired by Camilla Colombo and Emma Stevenson		
09:00	09:15	00:15	Presentation	From Chicago to Orbit: Can Space Learn to Fly Together? The 1944 Chicago Convention and the Future Governance of Outer Space	Giuseppe Sala	Politecnico di Milano
09:15	09:30	00:15	Presentation	A European perspective on the legal management of space sustainability: opportunities and Challenges	Giulia Pavesi	ESPI
09:30	09:45	00:15	Presentation	The joint Call of the Science Academies on the G7 Governments to Manage Large Satellite Constellations	François Baccelli	Académie des Sciences
09:45	10:50	01:05	Panel	Space debris: international coordination effort for a more sustainable shared space	Marco Castronuovo, J.-C. Liou, Andrea Vena, EU DEFIS office TBC, Lorenzo Arona	Agenzia Spaziale Italiana, NASA, European Space Agency, Defence Industry and Space Department, European Commission (DEFIS Office), UNOOSA
10:50	11:00	00:10	Introduction	Politecnico di Milano greetings	Marco Lovera	Politecnico di Milano
11:00	11:30	00:30		Coffee break “Dolce Salato” (sponsored by PoliMi GREEN SPECIES)		
11:30	13:00	01:30		Session 11: “Space capacity management” chaired by Antoinette Ott and Thibaut Maury		
				<i>Covered topics: Proposals to manage the space environment on the long-term, Economic studies on space debris mitigations and applicability of capacity management strategies.</i>		
11:30	12:00	00:30	Highlight	Integration of orbital environmental impacts within the EU Environmental Footprint framework for space: first methodological developments and outlook	Thibaut Maury-Micolier, Antoinette Ott; Marina Tasiopoulos; Vera Pinto	Defence Industry and Space Department, European Commission (DEFIS)
12:00	12:15	00:15	Presentation	Extended capabilities of the THEMIS 2.0 for Tracking the Health of the Environment and Missions in Space and interactions with satellite operators	Andrea Muciaccia; Diego Ramirez; Camilla Colombo; Daniel Lück; Martina Rusconi; Wiebke Retagne; Francesco De Bortoli; Juan Luis Gonzalo; Margherita Michalalles; Ben Johnson; Emma Stevenson; Francesca Letizia	Politecnico di Milano
12:15	12:30	00:15	Presentation	A Performance-Based Orbital Slotting Framework for Long-Term Space Sustainability	Pietro Russo, Giancarmine Fasano; Giorgio Isoletta; Roberto Opromolla	Università degli Studi di Napoli Federico II
12:30	12:45	00:15	Presentation	National Registration as a Tool for Space Sustainability: Lessons from the Philippines	Christian Villanueva	Private Practitioner
12:45	13:00	00:15	Presentation	Long-term environmental impact mitigation strategies for transatlantic launcher transport	Marie Delaroche	Maia Space
13:00	14:30	01:30		Lunch (pizza upon registration)		
13:30	14:00	00:30		COMPASS Coffee		
14:30	16:30	02:00		Session 12: “Towards the integration of all the open aspects in space sustainability” chaired by Antoinette Ott and Stijn Lemmens		
				<i>Covered topics: - Integrate different indicators such as light pollution, atmosphere emissions, casualty risk at re-entry, etc. - Life cycle assessment of space missions</i>		
14:30	15:00	00:30	Highlight	Extending the Polluter Pays Principle to Orbit: The Legal Challenges of Mandatory Life Cycle Assessments in the EU Space Act	Cecilia Nota	Università di Torino
15:00	15:15	00:15	Presentation	A payload-aware LCA eco-design tool for iterative launch vehicle development	Marie Delaroche	Maia Space
15:15	15:30	00:15	Presentation	Towards integrated ecodesign of space launch systems: A digital LCA tool for early-stage decision-making	Enrique Moliner; Noelia Sánchez Ortiz; Luis Martin	Arribes Enlightenment, S.L.
15:30	15:45	00:15	Presentation	Satellite Brightness Model	Achraf Mizmizi; Camilla Colombo	Politecnico di Milano
15:45	16:00	00:15	Presentation	Is Active Debris Removal Beneficial? An Environmental Risk Analysis with THEMIS 1.0	Martina Rusconi, Camilla Colombo; Stijn Lemmens; Francesca Letizia; Emma Stevenson	Politecnico di Milano
16:00	16:15	00:15	Presentation	Integrated Assessment of Satellite Optical Brightness for Preservation of Dark and Quiet Skies	Lorenzo Cimino, Lorenzo Mariani; Matteo Rossetti; Lorenzo Frezza; Fabrizio Piergentili	Università La Sapienza
16:15	16:30	00:15	Presentation	Storm-Time Geospace Variability and Orbital Sustainability: Why Space Weather Matters for Capacity Management	Nouhaila Bouhadi	University Chouaib Doukkali
16:30	17:00	00:30		Session 13: “Conclusions and next steps” chaired by Antoinette Ott and Marie Delaroche. Prepared by PoliMi, ESA, INAF.		
16:30	16:45	00:15		Best PhD paper award		EUCASS
16:45	17:00	00:15		Lesson learned and next steps for Space Capacity Allocation Community	All	