

Space capacity allocation for the sustainability of space activities Workshop

Politecnico di Milano, 3-5 June 2026

Start	End	Duration	Event	3 June, Wed	Speaker	Institution
Room: Carassa Dadda (BL28)						
08:30	09:30	01:00		Registration		
09:30	12:15	02:45		Session 1: "Is Space debris an environmental problem?"		
09:30	09:45	00:15		Introduction	Camilla Colombo, PoliMi TBC	Politecnico di Milano
09:45	10:00	00:15		Aim of the workshop	Camilla Colombo, Alessandro Rossi, Stijn Lemmens	
10:00	10:45	00:45	Keynote	Control of climate and space capacity allocation: what are the commonalities TBC	TBC	TBC
10:45	11:15	00:30	Highlight	ESA Title TBC	Stijn Lemmens	European Space Agency
11:15	11:45	00:30	Highlight	NASA Title TBC	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		
13:30	14:00	00:30		Session 2: "Challenges of space debris modelling"		
<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

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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	15:30	01:00		Session 3: Exercise “Space debris modelling workshop” . Prepared by PoliMi and MIT		
14:30	14:45	00:15	Presentation	Evaluating Collision Estimators and Metrics in Long-Term Space Debris Modelling	Elisa Boccolari; Camilla Colombo; Francesco De Bortoli	Politecnico di Milano
14:45	15:00	00:15	Presentation	The MOCAT Ecosystem: An Overview of the MIT Orbital Capacity Assessment Tool Suite	Giovanni Lavezzi; Richard Linares	MIT
15:00	15:30	00:30	Discussion	Overcoming uncertainties in space debris modelling	All	
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?”		
				<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	AI-Driven Multi-Criteria Decision System for Sustainable Orbital Debris Mitigation Integrating Technical and Legal Dimensions	Priscila Fassel	Independent Researcher, Physicist and Technologist
17:00	17:15	00:15	Presentation	Development of risk assessment tools at the University of Padova	Stefano Lopresti, Antonio Nicolino; Lorenzo Olivieri	Università di Padova

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17:15	17:30	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
17:30	17:45	00:15	Presentation	Operational Long Term Assessment of Periodic Satellite Conjunctions	Camilla Colombo; Achraf Mizmizi	Politecnico di Milano
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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Room: L12 and L13 (B12)						
09:00	10:45	01:45		Session 5: “How to assess the impact of space missions onto the space environment?”		
<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 model and IADC lesson learned TBC	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 Magaudda, 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 Ramírez Rodríguez; Francisco Simarro, 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?”		
<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; Camilla Colombo	Politecnico di Milano

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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		
14:00	14:30	00:30		Session 7: Exercise “Space capacity workshop” . 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; Camilla Colombo	Politecnico di Milano
14:15	14:30	00:15	Discussion	What is a reference environment evolution scenario, how can we access its health?	All	
14:30	15:45	01:15		Session 8: Exercise “How technical mitigation actions can be translated in policies?” . Prepared by SWF, PoliMi		
14:30	15:00	00:30	Highlight	Scenario-based modeling 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
15:00	15:15	00:15	Discussion	Discussion with spacecraft operators	All	
15:15	15:45	00:30	Panel	Panel with spacecraft operators: Are the mitigations needed to achieve a sustainable environment evolution scenario achievable from an operational point of view?	Mark Sturza, Liam Smith, Sam Diserens	Viasat, Amazon, UK Civil Aviation Authority
15:45	16:15	00:30		Coffee break (sponsored by PoliMi GREEN SPECIES)		

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16:15	17:45	01:30		Session 9: "Space debris mitigation policies"		
				<i>Covered topics: Policy studies on space debris mitigations and applicability of capacity management strategies.</i>		
16:15	16:30	00:15	Presentation	Business-as-Usual and Orbital Debris Path	Aneli Bongers; José Luis Torres Chacón	Universidad de Màlaga
16:30	16:45	00:15	Presentation	Space Debris Mitigation Policy in the Context of Deployment of Space Data Centers	Anna Hurova, Maryna Myklush	Space Chair, ENS-PSL
16:45	17:00	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	Space Insurance, Tokio Marine & Nichido Fire Insurance Co., Ltd.
17:00	17:15	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)
17:15	17:30	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
17:30	17:45	00:15	Presentation	Fostering Space Sustainability: Interdisciplinary Frameworks for Policy and Investment	Emmanuelle David, Angelina Frolova; Stephan Hellmich; Sebastian Villanueva; Xiao-Shan Yap	EPFL
17:45	18:15	00:30		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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Room: L12 and L13 (B12)						
09:00	11:00	02:00		Session 10: Panel "Space debris and space capacity measures in the EU space act and international cooperation"		
09:00	09:10	00:10	Introduction	Politecnico di Milano welcome	Marco Lovera	Politecnico di Milano
09:10	10:00	00:50	Panel	Space debris and space capacity measures in the EU space act and international cooperation	Marco Castronuovo, J.-C. Liou, Andrea Vena, EU DEFIS office TBC	Agenzia Spaziale Italiana, NASA, European Space Agency, Defence Industry and Space Department, European Commission (DEFIS) TBC
10:00	10:15	00:15	Presentation	Title ESPI TBC	Giulia Pavesi	ESPI
10:15	10:30	00:15	Presentation	IADC role TBC	tbc	tbc
10:30	10:45	00:15	Presentation	Title GCS TBC	tbc	tbc
10:45	11:00	00:15		How to foster international collaboration	All	All
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"		
				<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)

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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 Michalelles; 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	A scenario audit of the Space Footprint across turnover-sensitive and persistence-dominated orbital regimes	Vitali Braun; Franz Newland; Gurpreet Singh; Steven Young	IMS Space Consultancy GmbH, university of Ottawa, University of Waterloo
13:00	14:30	01:30		Lunch (Pizza upon registration)		
14:30	16:30	02:00		Session 12: "Towards the integration of all the open aspects in space sustainability"		
				<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	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.
15:15	15:30	00:15	Presentation	A payload-aware LCA eco-design tool for iterative launch vehicle development	Marie Delaroche	Maia Space
15:30	15:45	00:15	Presentation	<i>Reserved</i>		
15:45	16:00	00:15	Presentation	A Lifecycle Framework for Defining Clean Space Indicators through the CIRCLE Initiative	Fazira Azzahra Huwaidaa	Space Generation Advisory Council
16:00	16:15	00:15	Presentation	Long-term environmental impact mitigation strategies for transatlantic launcher transport	Marie Delaroche	Maia Space

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16:15	16:30	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
16:30	17:00	00:30		Session 13: "Conclusions and next steps". 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	



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