

2nd International Stardust Conference ----- STARCON 2 -----

Monday, 7 November 2022

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Space Environment Management -

Newton meeting room (09:15 - 11:00)

-Conveners: Massimiliano Vasile

| time | [id] title | presenter |
|-------|--|----------------------|
| 09:15 | [181] Opening | VASILE, Massimiliano |
| 09:30 | [154] KEYNOTE - AI-controlled Space Traffic. An overview of AI applications for Space Traffic Management | TIRADO, Jesus |
| 10:15 | [155] All vs All Conjunction Detection | GRASSI, Clara |
| 10:30 | [157] A Deep Learning-based Framework for Operational All-vs-All Conjunction Screening using Iterative Transfer Learning | STEVENSON, Emma |
| 10:45 | [158] Close encounter decision-making: comparing CASSANDRA and CNES operational processes | SANCHEZ, Luis |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Space Environment Management -

Newton meeting room (11:30 - 13:00)

-Conveners: Massimiliano Vasile

| time | [id] title | presenter |
|-------|---|-----------------------|
| 11:30 | [160] Debris risk metrics and orbital capacity: from technical assessments to policy tools" | LETIZIA, Francesca |
| 12:00 | [167] Fast and reliable computation of the instantaneous orbital collision probability | MASSON, Matthieu |
| 12:15 | [168] Multi-Static Radar for Manoeuvre Detection | DA GRACA MARTO, Simao |
| 12:30 | [170] Operational challenges for collision avoidance operations | SIMINSKI, Jan |
| 12:45 | [103] Growth of the European STM Industrial Landscape: the GMV Case | TIRADO, Jesús |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Space Environment Management -

Newton meeting room (14:00 - 15:45)

-Conveners: Massimiliano Vasile

| time | [id] title | presenter |
|-------|--|--------------------|
| 14:00 | [172] Demystifying the Chaos in LEO. | MCKNIGHT, Darren |
| 14:45 | [173] Removing barriers for transitioning into the new space infrastructure paradigm | ESTABLE, Stéphane |
| 15:00 | [174] Keynote - Sustainability of Orbital Operations: status of Space Pollution and proposed actions | BONNAL, Christophe |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Space Environment Management -**Newton meeting room (16:15 - 17:45)****-Conveners: Massimiliano Vasile**

| time | [id] title | presenter |
|-------|---|----------------------|
| 16:15 | [175] ABACO, an Autonomous Board for Avoiding COLLisions | MODENINI, Dario |
| 16:30 | [176] Technical overview of the ASTRA project | ROSIGNOLI, Luca |
| 16:45 | [179] Ultra Wide-field Optical Tracking of LEO Objects: The Astra Project | BUZZONI, Alberto |
| 17:00 | [177] Recent activities at the Warwick Centre for Space Domain Awareness | BLAKE, James |
| 17:15 | [104] Resident Space Object Proper Elements for Maneuver Detection | ROSENGREN, Aaron |
| 17:30 | [180] Apparent Colours as Manufacturing Markers for GEO Satellites | DI CECCO, Alessandra |

Tuesday, 8 November 2022

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Modelling & Evolution of the Space Environment - Newton meeting room (09:15 - 11:00)

-Conveners: Alessandra Celletti

| time | [id] title | presenter |
|-------|---|----------------------|
| 09:15 | [185] Opening | CELLETTI, Alessandra |
| 09:30 | [307] LUNISOLAR RESONANCES - OLD BUT NOT OBSOLETE. | BREITER, Slawomir |
| 10:15 | [187] Chaos in the Geminid meteoroid stream | COURTOT, Ariane |
| 10:30 | [188] Computation of Proper Elements. Reconnecting Groups of Simulated Space Debris | VARTOLOMEI, Tudor |
| 10:45 | [189] Secular Lunisolar Resonances in the MEO Region and the Eccentricity Growth Phenomenon | LEGNARO, Edoardo |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Modelling & Evolution of the Space Environment - Newton meeting room (11:30 - 13:00)

-Conveners: Catalin Gales

| time | [id] title | presenter |
|-------|---|-----------------------------|
| 11:30 | [228] Keynote - Natural perturbations as allies for space debris mitigation and long-term sustainability: the case of the solar radiation pressure - oblateness coupled effect. | ALESSI, Elisa Maria |
| 12:15 | [229] Initial orbit Determination of Cislunar Objects using Only Optical Data | HOU, Xiyun |
| 12:30 | [230] Chebyshev-based Polynomial Algebra Monte Carlo Propagation with Generalised Equinoctial Orbital Elements | Mr HALLGARTEN LA CASTA, Max |
| 12:45 | [231] Circumplanetary dust dynamics | LIU, Xiaodong |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Modelling & Evolution of the Space Environment - Newton meeting room (14:00 - 15:50)

-Conveners: Christos Efthymiopoulos

| time | [id] title | presenter |
|-------|--|-------------------|
| 14:00 | [232] Keynote - Orbital Perturbations of Charged Dust and Space Debris due to Space Weather Effects | LHOTKA, Christoph |
| 14:45 | [233] Secular evolution of debris in highly eccentric and inclined orbits | DOGKAS, Anargyros |
| 15:00 | [234] Keynote - Space Situational Awareness (SSA) Office Towards a unified SSA framework to address short- to long-term challenges | RUCH, Vincent |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Modelling & Evolution of the Space Environment - Newton meeting room (16:15 - 17:45)

-Conveners: Christos Efthymiopoulos

| time | [id] title | presenter |
|------|------------|-----------|
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| | | |
|-------|--|--------------------|
| 16:15 | [235] Keynote - Monitoring of high-altitude space traffic and distant satellite disposal design. | GKOLIAS, Ioannis |
| 17:00 | [236] An overview of the resonances arising from the coupling of the Earth's oblateness with the solar radiation pressure effect | PAOLI, Roberto |
| 17:15 | [237] Space debris environment propagation through a continuum approach | GIUDICI, Lorenzo |
| 17:30 | [238] Ensuring the sustainable future use of space: a new tool for tracking environment health and mission impact | GONZALO, Juan Luis |

Wednesday, 9 November 2022

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: In-orbit servicing, manufacturing and recycling, Part I - Newton meeting room (09:15 - 11:00)

-Conveners: Kurt Schwenk; Marko Jankovic

| time | [id] title | presenter |
|-------|---|-------------------------------------|
| 09:15 | [317] In-orbit servicing, manufacturing and recycling, Part I | SCHWENK, Kurt Dr JANKOVIC, Marko |
| 09:30 | [239] New approaches for orbital robotics at ESA | VISENTIN, G. |
| 10:15 | [240] European Operations Framework | DITTRICH, Sebastian |
| 10:30 | [241] On-Orbit Servicing initiative in Europe: the EROSS projects suite | BEHAR-LAFENETRE, Stéphanie |
| 10:45 | [242] Making Active Debris Removal a Reality: The Clearspace-1 Mission | ARDAENS, Jean-Sébastien |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: In-orbit servicing, manufacturing and recycling, Part I - Newton meeting room (11:30 - 13:00)

-Conveners: Kurt Schwenk; Marko Jankovic

| time | [id] title | presenter |
|-------|--|-------------------------|
| 11:30 | [243] Astroscale: A Perspective on Space Sustainability and Commercial Debris Removal Servicing | FORSHAW, Jason |
| 11:45 | [244] In-Orbit Servicing - building a sustainable space infrastructure | BELLA, Salvatore Andrea |
| 12:00 | [245] ReMoVE – Rendezvous Modelling Visiting and Enhancing | GAIAS, Gabriella |
| 12:15 | [246] The Future of Collaboration and Development of Space Robotics | RAYSSIGUIE, Esther |
| 12:30 | [247] Mechanics & Control of Orbital Robotic Systems from Simulations, to Lab & Flight Experimentation | ROMANO, Marcello |
| 12:45 | [312] Post-capture estimation of tethered space debris via tension measurements and feature tracking | BOTTA, Eleonora |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: In-orbit servicing, manufacturing and recycling, Part I - Newton meeting room (14:00 - 15:30)

-Conveners: Kurt Schwenk; Marko Jankovic

| time | [id] title | presenter |
|-------|--|-------------------------------------|
| 14:00 | [249] Relative Navigation Challenges for Active Debris Removal Missions and the Role that Artificial Intelligence Can Play | URRUTXUA, Hodei |
| 14:45 | [250] EO-based pose estimation for spacecraft relative navigation to support autonomous In-Orbit Servicing missions | OPROMOLLA, Roberto |
| 15:00 | [145] THALES SERVICES NUMÉRIQUES (TSN) SPACE ACTIVITIES WITH A SPECIAL FOCUS ON SST ACTIVITIES. | Mr NARDI, Alex MOREIRA, Philippe |

Thursday, 10 November 2022

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: In-orbit servicing, manufacturing and recycling, Part II - Newton meeting room (09:15 - 11:00)

-Conveners: Marko Jankovic

| time | [id] title | presenter |
|-------|---|--------------------|
| 09:15 | [251] Challenges of pose estimation for future OOS missions | KLIONOVSKA, Ksenia |
| 10:00 | [252] Continuous Delivery for a Real-Time Robotic Test Facility: Modernization of Facility Monitoring and Control System of the European Proximity Operations Simulator | BURRI, Matthias |
| 10:15 | [253] Experimental Methods for Re-entry Aerothermodynamics Analysis – from Ground Based Measurements to Airborne Detection | LOEHLE, Stefan |
| 10:30 | [254] Close-range relative navigation with EPOS 6D pose estimator | KAJAK, Karl Martin |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: In-orbit servicing, manufacturing and recycling Part II - Newton meeting room (11:30 - 13:00)

-Conveners: Marko Jankovic

| time | [id] title | presenter |
|-------|---|-------------------------|
| 11:30 | [255] Powder-based additive manufacturing in micro-gravity conditions | KARALASINGAM, Anushanth |
| 11:45 | [256] Intelligent Characterisation of Satellites from Hyperspectral Time Series Analysis | WALKER, Lewis |
| 12:00 | [248] Towards Sequential Controller Composition for Robotic Active Debris Removal | VYAS, Shubham |
| 12:15 | [258] Spacecraft Charging Considerations for On-Orbit Servicing and Debris Mitigation in High Earth Orbit | HAMMERL, Julian |
| 12:30 | [309] How In-Orbit Services are building up a sustainable approach to Space Economy | MAZIERES, Francois |
| 12:45 | [260] Calibration of ablation models for atmospheric entry thermal protection systems | DEL VAL, Anabel |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Re-entry analysis and design for demise - Newton meeting room (14:00 - 15:45)

-Conveners: Marco Fossati

| time | [id] title | presenter |
|-------|--|---------------------|
| 14:00 | [261] Keynote - Design for Demise: Open points and Future challenges. | DE PERSIS, Cristina |
| 14:45 | [259] Challenges in Testing and Validation of Space Debris Demise | CHAZOT, Oliver |
| 15:00 | [263] Space Environment Sustainability and Space Situational Awareness at NASA | MASHIKU, Alinda |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Re-entry analysis and design for demise - Newton meeting room (16:15 - 18:15)

-Conveners: Marco Fossati

| time | [id] title | presenter |
|-------|--|--------------------------|
| 16:15 | [262] Vibrational kinetics in 2D High enthalpy flows using GPUs | COLONNA, Gianpiero |
| 16:30 | [264] Transport properties for planetary atmospheres: the hybrid approach. | LARICCHIUTA, Annarita |
| 16:45 | [265] Development of a Multi-fidelity Framework for Destructive Atmospheric Entry Simulation | MORGADO, Fabio |
| 17:00 | [266] Development of an Uncertainty Framework for Risk Analysis During Atmospheric Re-entry | PEDDAKOTLA, Sai Abhishek |
| 17:15 | [267] A data driven approach to modelling and simulating atmospheric entry. | GRAHAM, Julia |
| 17:30 | [298] Session closing remarks | FOSSATI, Marco |

Friday, 11 November 2022

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Sustainable exploration and exploitation of outer space. - Newton meeting room (09:15 - 10:55)

-Conveners: Andrew Wilson

| time | [id] title | presenter |
|-------|--|-------------------|
| 09:15 | [318] Opening. | WILSON, Andrew |
| 09:30 | [299] Space sustainability: a dialogue between research, industry and policy makers | DAVID, Emmanuelle |
| 10:15 | [300] An Evaluation into the Sustainability of Global Spaceports and the Role of Space Technologies in Supporting Sustainable Practices, | HARVEY, Euan |
| 10:35 | [301] A Transport Network for In-Orbit Recycling Exploiting Natural Dynamics. | LAINO, Maria Anna |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Sustainable exploration and exploitation of outer space. - Newton meeting room (11:20 - 13:00)

-Conveners: Andrew Wilson

| time | [id] title | presenter |
|-------|---|---------------------------------------|
| 11:20 | [302] The Strathclyde Space Systems Database (SSSD). | WILSON, Andrew |
| 11:40 | [303] Life-cycle and atmospheric impact analysis of future reusable launch vehicles. | DOMINGUEZ CALABUIG, Guillermo Joaquin |
| 12:00 | [311] ESA CSR and Strategy for overcoming CLIMATE and SUSTAINABILITY challenges | MIRAILLES, Marion |
| 12:20 | [123] Understanding Corporate Strategy in the New Space Era: Perspectives on Space Debris | MÜNCH, Maximilian |
| 12:40 | [124] The Importance of LCA to the future of space sustainability | GILL, Max |

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Stardust-R Project Working Groups - Newton meeting room (14:00 - 15:00)

-Conveners: Massimiliano Vasile

SPACE ENVIRONMENT MANAGEMENT & SUSTAINABILITY SYMPOSIUM: Andrea Milani Challenge Prize Ceremony - Newton meeting room (15:00 - 15:45)

-Conveners: Christos Efthymiopoulos