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The Space Disposal and Debris Mitigation Conference

An International Convention of Technology, Science, Policy, and Innovation

March 9-10, 2021
Online | Central Time

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Featuring Keynote Talks by

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NASA esa SPACEX

Overview

We have now entered a new space age where the volume of objects in orbit and funding to enable new constellations is extremely high. As we pioneer into this space frontier, one of the most considerable challenges is the protection of its environment. Designing targeted deorbit methodologies is critical to maintaining the scale of satellite deployment our industry is making.

While mission disposal is important, it remains a highly complex design confrontation. Technologies such as tethering, propulsion, drag or other traditional methods battle as the superior ROI for end users. Additionally, in much the same spirit as the age-old hiking principle, Deorbit Space Policy tends to be adopting the adage "pack it in, pack it out." This virtual summit of speakers will cover all these issues in a flagship conference on orbital Waste Disposal and debris mitigation.

Learning Objectives

- Discuss the major space deorbit methods for comprehensive debris mitigation
- Discuss space policy directives by the FCC and FAA on mission reentry
- Identify design techniques to integrate deorbit technologies within any satellite system
- Review the important complexities of constellation launches in the new space environment
- Explain satellite deorbiting project costs, design, and compliance

Who Should Attend

The conference will provide a unique forum for information exchange, technical discussions and networking between space debris researchers, engineers & decision takers of industry, policy makers, regulators & space lawyers, insurance underwriters, space & ground system operators, institutional organizations (e.g. space agencies, EU, UNCOPUOS, IAA, COSPAR), academia and the government sector.

Online Conference Agenda

TUESDAY, MARCH 9, 2021 - CENTRAL TIME

9:00 am – 4:00 pm **Conference Timing**

8:45 – 9:00 am **Log In**

9:00 – 9:30 am **Debris Mitigation in A New Space Age**
The next decade could see over 100,000 satellites added to Low Earth Orbit. The proliferated LEO constellations (pLEO) of New Space are driving the need for active space traffic management and forcing changes in space policy. The pLEOs and the new technologies used will create operational challenges for existing space operators. Business as usual will no longer be practical, and if the challenges are not addressed, we could see a huge increase in the debris population. But what should the rules be? Should constellations be treated separately from individual spacecraft? This talk will discuss the interplay of space policy rules and the impact on the near-Earth operational environment.
Ted Muelhaupt, Principal Director, Center for Orbital and Reentry Debris Studies, The Aerospace Corporation

9:30 – 10:00 am **Disposal of Spacecraft from Large Constellations: Risks and Realities**
Proposals have been announced that would potentially add thousands of new satellites to the Low Earth Orbit environment. But these satellites are designed to have relatively short lifetimes, some suggest as little as 5 years. Given that, a constellation with 1000 satellites could start deorbiting the first 200 satellites after 5 years and continue that strategy each year into the future. So should those of us on the ground have any concerns about debris surviving these reentries? Is there a possibility that aircraft might be affected? This talk will discuss these and other issues and concerns about disposal of satellites from large constellations.
Dr. William Ailor, Ph.D, Technical Fellow, Center for Orbital and Reentry Debris Studies, The Aerospace Corporation

10:00 – 10:45 am **KEYNOTE – ESA's Space Safety Programme and Orbital Debris**
The keynote will outline the approach that ESA is taking in its programme to address the issue of orbital debris. This includes technology for surveillance and tracking with a focus on laser technology. This talk will further address novel solutions for handling operational collision avoidance in evermore complex space traffic scenarios. Finally, we will introduce ESA's flagship mission "Clearspace", the first ever removal of a space debris object from space and also technology that will improve the implementation of mitigation actions on board.
Holger Krag, Head of Space Debris Office, European Space Agency

10:45 – 11:30 am **Choosing the Right Technology – Automated Collision Avoidance**
Innovation in the space industry is accelerating and satellite operations are becoming more complex. In response, a new generation of companies enable satellite operators to achieve new levels of automation and scalability using SaaS services. In this talk, LeoLabs will discuss a SaaS platform for automated navigation for large satellite fleets entering LEO. Examples will be given of launch and early operations, and collision avoidance.
Dan Ceperley, CEO, LeoLabs & Technical Advisor, Space for Humanity

11:30 am – 12:00 pm **Lunch Break**

Online Conference Agenda

TUESDAY, MARCH 9, 2021 - CENTRAL TIME (CONTINUED)

12:00 – 12:45 pm **The ROC-FALL System – The Drag Principle**
The small sat revolution requires us to be faster, less expensive, less wasteful, and more efficient in everything deployed. Project lifecycles have largely shifted from design and development cycles of three to five years to nine to eighteen months. The presentation today will share about how deployable atmospheric drag deorbit devices can act as a viable reentry tool for cost-effective mission end-of-life.
Dr. Bruce Davis, Director of Space Antenna and Deorbit Products, Roccor

12:45 – 1:30 pm **Terminator Tape – The System Tethering Principle**
The presentation will cover the basics about tethers, from momentum exchange to electrodynamics propulsion working with Lorentz force interactions and the Earth's magnetic field. This talk will cover how tethers are being used in practical case studies and viable applications.
Dr. Robert Hoyt, Founder & President, Tethers Unlimited

1:30 – 1:45 pm **Afternoon Break**

1:45 – 3:00 pm **Space Technologies Roundtable**
Moderator: Dr. Bruce Davis, Director of Space Antenna and Deorbit Products, Roccor
Panelists: Robert Hoyt, Founder & President, Tethers Unlimited
Dave Herbert, Vice President of Global Communications, Astroscale
David Goldstien, Principal Guidance Navigation and Control Engineer, SpaceX

3:00 – 3:45 pm **Active Debris Removal (ADR) Technology and On-Orbit Capture – The New Principle**
Rounding out the technology demonstrations, this featured talk will discuss on-orbit capture, docking, and new technologies on dynamic, new ways to solve the space waste problem. Delivered by former OneWeb director, TedX speaker, and current CTO of Astroscale Mike Lindsay, this cutting-edge talk will cover an exciting technologies and practices in a unique, multidimensional perspective.
Mike Lindsay, Chief Technology Officer, Astroscale Inc.

Online Conference Agenda

WEDNESDAY, MARCH 10, 2021 - CENTRAL TIME

9:00 am – 12:00 pm **Conference Timing**

8:45 – 9:00 am **Log In**

9:00 – 9:45 am **CASE STUDY: DeOrbitSail**
The DeOrbitSail project was a collaboration to build a 3U CubeSat sized satellite with a deployable sail that demonstrated rapid deorbiting. The deorbiting capability of the DeOrbitSail satellite was due to increase aerodynamic drag from the large surface area of the deployed sail in low earth orbit (LEO). From our proposed concept, the satellite would return to Earth and burn up in the atmosphere over time as its altitude reduces.
Alex da Silva Curiel, Business Development Manager – International, Surrey Satellite Technology

9:45 – 10:30 am **KEYNOTE #2: Orbital Debris Mitigation and Challenges to the Space Community**
Controlling the growth of the orbital debris population is a high priority for NASA, the United States, and the major space-faring nations of the world to preserve near-Earth space for future generations. Mitigation measures can take the form of curtailing or preventing the creation of new debris, designing satellites to withstand impacts by small debris, and implementing operational procedures such as using orbital regimes with less debris, adopting specific spacecraft attitudes, and even maneuvering to avoid collisions with debris. This Keynote will talk about some of these measures taken by NASA along with the Space Community, looking towards future growth and a strategy for more sustainable space.
Dr. Jer Chyi (J.-C.) Liou, Chief Scientist, Orbital Debris, NASA Johnson Space Center

10:30 – 12:00 pm **Policy Roundtable and A Look at What's Next**
Moderator: Jeff Foust, Author and Sr. Staff Writer, Space News
Ted Muelhaupt, Principal Director of Center for Orbital and Reentry Debris Studies, Aerospace Corporation
Steph Earl, Space Traffic and Air Force Integration Lead, Federal Aviation Administration (FAA)
Karl Kensinger, Active Division Chief, Federal Communication Commision (FCC)
Charity Weeden, Vice President, Global Space Policy, Astroscale

Instruction Methods

Power Point presentations and open discussion will be used

IACET Credits

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

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Online Delivery & Participation Details

We will be using Microsoft Teams to facilitate your participation in the upcoming event. You do not need to have an existing Teams account in order to participate in the broadcast – the online course will play in your browser and you will have the option of using a microphone to speak with the room and ask questions, or type any questions in via the chat window and our on-site representative will relay your question to the instructor.

- You will receive a meeting invitation which will include a link to join the meeting.
- Separate meeting invitations will be sent for the morning and afternoon sessions of the online course.
  - You will need to join the appropriate meeting at the appropriate time.
- If you are using a microphone, please ensure that it is muted until such time as you need to ask a question.
- The remote meeting connection will be open approximately 30 minutes before the start of the online course. We encourage you to connect as early as possible in case you experience any unforeseen problems.

Requirements for Successful Completion

You must be logged in for the entire presentation and send in the evaluation after the online course is completed.

Please Select

- ◯ **THE SPACE DISPOSAL AND DEBRIS MITIGATION ONLINE CONFERENCE:** MARCH 9-10, 2021: US $995 (Single Connection)
- ◯ **PACK OF 5 CONNECTIONS:** US $3,980 *(20% Discount)*
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How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

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CREDIT CARD INFORMATION

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OR Enclosed is a check for $ _____ to cover _____ registrations.

Substitutions & Cancellations
Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before February 5, 2021 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other LRA Institute event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, LRA's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 1 888-305-0392 . LRA reserves the right to alter this program without prior notice.