

2nd International Symposium on Very Low Earth Orbit Missions and Technologies

13 and 14 January 2025, Stuttgart, Germany



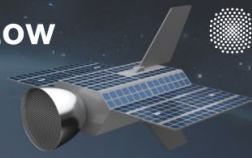
Full Programme (as of 11 January 2025)

Day 1 - Monday, 13 January 2025

Time	Event	Speaker(s) / Chair(s)	Location
08:00	Check-in, Morning Coffee		Foyer
09:00	Welcome by the Vice Rector for Research and Sustainable Development of the University of Stuttgart	Bischoff, M. (University of Stuttgart, DE)	Auditorium
09:05	Welcome by the Symposium Chairs	Fasoulas, S. (University of Stuttgart, DE) & Roberts, P. (The University of Manchester, UK)	Auditorium
09:20	Keynote: VLEO and Space Sustainability: How does Very Low Earth Orbit contribute to the shift towards more sustainable space activities? (VLEO2025-A-01)	Roberts, P. (The University of Manchester, UK)	Auditorium
09:40	Keynote: Motivation, Structure and Goals of the Collaborative Research Center 1667: Advancing Technologies of Low Altitude Satellites (ATLAS) (VLEO2025-A-02)	Fasoulas, S. (University of Stuttgart, DE)	Auditorium
10:00	Technical Session #1: Science Mission Designs and Concepts	Stolle, C. (Leibniz Institute of Atmospheric Physics Kühlungsborn, DE) & Kula Arslan, A. (University of Stuttgart, DE)	Auditorium
	Mission and System Design for the EarthNext CubeSat VLEO Mission (VLEO2025-1-01)	La Marca, T.A. (University of Naples, IT)	
	Extremely Low Earth Orbit Imaging and Technology Explorer (ELITE) Satellite: Building Capabilities for Very Low Earth Orbit Missions in Singapore with Aerodynamic and Charged Plasma Simulations (VLEO2025-1-02)	Chan, W.L. (Nanyang Technological University, SG)	
	Skimsat IOD: A VLEO mission platform demonstrator (VLEO2025-1-03)	Cassidy, S. (Thales Alenia Space UK)	
	VLEO Design and development status in SITAEL (VLEO2025-1-04)	Ciolini, M. (SITAEL, IT)	
11:00	Coffee Break		Foyer
11:30	Technical Session #2: System Design	Lappas, V. (University of Athens, GR) & Gutierrez, E. (University of Stuttgart, DE)	Auditorium
	Operational Aspects of an ABEP System for Drag Compensation in VLEO (VLEO2025-2-01)	Walther, M. (Astos Solutions, DE)	
	Holistic systems modelling of Very Low Earth Orbits (VLEOs) incorporating Atmosphere Breathing Electric Propulsion (ABEP) (VLEO2025-2-02)	Kent, B. (The University of Manchester, UK)	
	Exploring Very Low Earth Orbit (VLEO) Spacecraft Design: Challenges and Innovations for Atmospheric Operations and Multi-Role Capabilities (VLEO2025-2-03)	Alao, S. (Stars Edge Ltd., UK)	
	AERIS-S: Hybrid Air-Breathing and Refuellable Propulsion for Sustainable, Extended Operations from VLEO to LEO (VLEO2025-2-04)	Alao, S. (Stars Edge Ltd., UK)	
12:30	Lunch Break		Foyer
13:30	Interactive Session I: Gauging the VLEO Community	Crisp, N. (The University of Manchester, UK) & Traub, C. (University of Stuttgart, DE)	Auditorium

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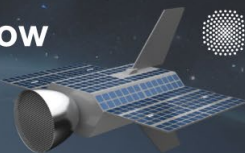
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Time	Event	Speaker(s) / Chair(s)	Location
14:00	Technical Session #3: VLEO Application Scenarios	Sneeuw, N. (University of Stuttgart, DE) & Braun, F. (University of Stuttgart, DE)	Auditorium
	Closer to Earth, Faster in Space: The potential of VLEO for Responsive Space (VLEO2025-3-01)	Bambach, P. (German Aerospace Centre DLR, DE)	
	Very Low Earth Orbit Telecommunications Constellations for Non-Terrestrial Network Connectivity (VLEO2025-3-02)	Muirhead, I. (The University of Manchester, UK)	
	Optimizing LPWAN-based Satellite Constellations: A Comparative Study of VLEO and LEO Orbits (VLEO2025-3-03)	Lee, C. (Korea Aerospace University, KR)	
	Molecular Beam Investigations of Atomic Oxygen Reactivity and Scattering on Material Surfaces for Satellites in Very Low Earth Orbit (VLEO2025-3-05)	Minton, T.K. (University of Colorado, US)	
15:00	Poster Session Introduction	Pagan, A.S. (University of Stuttgart, DE)	Auditorium
15:30	Poster Session, Long Coffee Break	see below for listing of poster contributions	Foyer
16:30	Technical Session #4: Very Low Earth Orbit Control	Flohrer, T. (European Space Operations Centre, DE) & Turco, F. (University of Stuttgart, DE)	Auditorium
	Development of a Novel CubeSat-scale Air-breathing Electric Propulsion System (VLEO2025-4-01)	Giannetti, V. (Celeste S.r.l., IT)	
	Passive Vapor-pressure Driven Propulsion for CubeSats in Very Low Earth Orbit (VLEO2025-4-02)	Kang, S.J. (United States Naval Academy, US)	
	A high-fidelity orbit propagator and control strategy for VLEO platforms (VLEO2025-4-03)	Gunaltay, H.E. (University of Surrey, UK)	
	Design of an Autonomous Formation Flight Control System Using Differential Drag and Electric Propulsion in Very Low Earth Orbits (VLEO2025-4-04)	Tuzcu, G. (Middle East Technical University, TR)	
17:30	Close-out Day 1	Fasoulas, S. (University of Stuttgart, DE) & Roberts, P. (The University of Manchester, UK)	Auditorium
19:00	Conference Dinner		Leonhardt's Event Location

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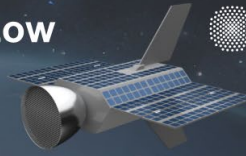


Day 2 - Tuesday, 14 January 2025

Time	Event	Speaker(s) / Chair(s)	Location
08:00	Check-in, Morning Coffee		Foyer
08:45	Guided Tours		Auditorium
09:30	Technical Session #5: Atmosphere-Breathing Electric Propulsion	Laufer, R. (Luleå University, SE) & Lee, W. (University of Stuttgart, DE)	Auditorium
	Analysis and prospect of key factors to improve the performance of Air-Breathing Electric Propulsion system in China (VLEO2025-5-01)	Xia, C. (Beihang University, CN)	
	Development of AERIS: Low-energy throttleable VLEO Air-breathing electric propulsion (ABEP) technology (VLEO2025-5-02)	Herrara, A. (Stars Edge Ltd., UK)	
	Air-breathing Electric Propulsion: Testing Approaches and Simulations (VLEO2025-5-03)	Moriconi, B. (Sant'Anna School of Advanced Studies, IT)	
	Simulation and Configuration Design of Permanent Magnets applied to an RF Helicon-based Thruster (VLEO2025-5-04)	Papavramidis, K. (University of Stuttgart, DE)	
10:30	Coffee Break		Foyer
11:00	Technical Session #6: ABEP Plasma Physics	Tagawa, M. (Kobe University, JP) & Papavramidis, K. (University of Stuttgart, DE)	Auditorium
	Progress in ground testing of intake-collector for Air-Breathing Electric Propulsion (VLEO2025-6-01)	Caseiro Jorge, P.D. (von Karman Institute for Fluid Dynamics, BE)	
	Current Progress in the Development of an ECR Plasma Source for Air-Breathing Electric Propulsion System (VLEO2025-6-02)	Šťastný, M. (SpaceLabEU, CZ)	
	Investigation of low temperature rf-plasmas inside a RIT-10 and rf-neutralizer using oxygen/nitrogen gas mixtures as propellant (VLEO2025-6-04)	Zorn, J. (Justus Liebig University Giessen, DE)	
12:00	Lunch Break		Foyer
13:00	Interactive Session II: Fostering the VLEO Community	Crisp, N. (The University of Manchester, UK) & Traub, C. (University of Stuttgart, DE)	Auditorium
13:45	Technical Session #7: Gas-Surface Interactions and Materials	Dekorsy, T. (German Aerospace Centre / University of Stuttgart, DE) & Schlitzer, A. (University of Stuttgart, DE)	Auditorium
	Characterization of RF plasma degradation of Kapton films (VLEO2025-7-01)	Caseiro Jorge, P.D. (von Karman Institute for Fluid Dynamics, BE)	
	FEP erosion in VLEO environments: Comparison of ground data and SLATS observations (VLEO2025-7-02)	Tagawa M. (Kobe University, JP)	
	Atomic Oxygen Resistance of Silsesquioxane-Coated Polyimide Films Studied by LEO/VLEO and Lab Exposures (VLEO2025-7-03)	Goto, A. (Japan Aerospace Exploration Agency JAXA, JP)	
	Modelling Surface Roughness in Gas-Surface Interaction for Orbital Aerodynamics (VLEO2025-7-04)	Anton, S.V. (Delft University of Technology, NL)	
14:45	Coffee Break		Foyer

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Time	Event	Speaker(s) / Chair(s)	Location
15:00	Technical Session #8: Particle Simulation Methods	Poovathingal, S. (University of Kentucky, USA) & Ellenberger, K.-S. (University of Stuttgart, DE)	Auditorium
	Investigation of critical aspects for Atmosphere-breathing electric propulsion systems with the Direct Simulation Monte Carlo method for VLEO and ULEO applications (VLEO2025-8-01)	Pessina, V. (Universität der Bundeswehr München, DE)	
	A Numerical Investigation of the Effect of Flow Parameters and Wall Models on Gas-Surface Interactions in ABEP Applications (VLEO2025-8-02)	Agir, M.B. (The University of Manchester, UK)	
	Particle-based numerical reproduction of the flow in the VKI DRAG-ON facility (VLEO2025-8-03)	Parodi, P. (von Karman Institute for Fluid Dynamics and KU Leuven, BE)	
	Enhanced gas-surface scattering modeling for VLEO satellites in DSMC simulations (VLEO2025-8-04)	Schütte, M. (University of Stuttgart, DE)	
16:00	Coffee Break		Foyer
16:15	Technical Session #9: Aerodynamic Control	Crisp, N. (The University of Manchester, UK) & Tuttas, F. (University of Stuttgart, DE)	Auditorium
	Maximization of Lift-to-Drag Ratio for VLEO Platforms using Free-Form Deformation Techniques (VLEO2025-9-01)	Agez, B. (ONERA, FR)	
	Propellant-less Steering Law for Mitigating Orbital Decay in Small Satellites Using Aerodynamic Forces and Solar Radiation Pressure (VLEO2025-9-02)	Bortotto, A. (Julius-Maximilians-Universität Würzburg, DE)	
	Machine Learning-Based Quasi-Optimal Feedback Control for a Propellantless Collision Avoidance in (Very) Low Earth Orbit (VLEO2025-9-03)	Gaglio, E. (Scuola Superiore Meridionale, IT)	
	Operationalizing Differential Drag Control: A Planning Routine for the S-Net Satellite Formation (VLEO2025-9-04)	Ingrillini, L. (University of Stuttgart, DE)	
17:45	Close-Out	Fasoulas, S. (University of Stuttgart, DE) & Roberts, P. (The University of Manchester, UK)	Auditorium
18:00	End of Conference		

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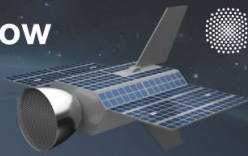


Overview of Poster Contributions (Poster Session on Monday, 13 January 2025, 15:30 – 17:00)

Number	Title	Presenter(s)
VLEO2025-0-02	ROMEO a MEO and VLEO research platform: Design considerations for the VLEO applications	Löffler, T. (University of Stuttgart, DE)
VLEO2025-0-03	VLEO optical satellite tracking and satellite laser ranging technology development	Wagner, G. (German Aerospace Centre DLR, DE)
VLEO2025-0-04	Atomic oxygen densities in VLEO measured by SLATS/AOFS mission	Yokota, K. (Kobe University, JP)
VLEO2025-0-05	Modeling atmosphere-breathing cathode-less thruster based electric propulsion systems	Oamer, N. (International University of Rabat, MA)
VLEO2025-0-06	End-to-end test campaign design and preparation of an ABEP system developed at IRS	Papavramidis, K. (University of Stuttgart, DE)
VLEO2025-0-07	Impact of hyperthermal oxygen on alumina surfaces investigated by molecular dynamics simulations	Hocker, S. & Lipp, H. & Segreto, N. (University of Stuttgart, DE)
VLEO2025-0-08	Thermal affected behavior of Perovskite Solar Cells for Space Applications	Frebel, A. (University of Stuttgart, DE)
VLEO2025-0-09	Simulation of plasma-spacecraft interaction and charging in very low Earth orbit using particle methods	Skácel, J. (von Karman Institute for Fluid Dynamics, BE)
VLEO2025-0-10	Scattering of thermal Ar atoms at space-exposed Kapton surface and a GSI model for drag mitigation studies	Tagawa, M. (Kobe University, JP)
VLEO2025-0-11	Material Optimisation Strategies for Very Low Earth Orbit (VLEO) Spacecraft: An Analysis Using the AERIS Platform	Herrara, A. (Stars Edge Ltd, UK)
VLEO2025-0-13	Design Analysis Methodology for Combined Passive and Active Control Systems in VLEO Satellites	Nakhaee-zadeh, A. (RedWire, BE)
VLEO2025-0-16	Aerodynamic Attitude Control of Very Low Earth Orbit Satellites: Simulative Analysis and Insights into Nonlinear System Properties	Geyer, F. & Tuttas, F. (University of Stuttgart, DE)
VLEO2025-0-17	Extremely Low Earth Orbit Imaging and Technology Explorer (ELITE) Satellite Platform System Configuration & Development	Lim, W.S. (Nanyang Technological University, SG)
VLEO2025-0-18	Real-time Atomic Oxygen Detection Using Transition Metal Oxide Coated Hydrogen-Terminated Diamond Surface	Tsang, S.H. (Nanyang Technological University, SG)

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Floor Plan of Symposium Venue

