Conference Dinner

Join us at *Eventlocation Leonhardts* at the foot of the *Television Tower (Fernsehturm) Stuttgart* on Monday, 13 January 2025, at 19:00 CET.

How to get there:

1. **Shuttle bus transfer:** Two shuttle buses will depart from the conference venue at 18:30 and depart from the dinner location at 22:00. They will return first to the conference venue and continue onwards at 22:30 to *Bahnhof Stuttgart-Vaihingen*, where various connections to public transportation lines are available.
2. **Public transportation:** From the S-Bahn station *Universität* on campus, take any of the lines S1, S2, or S3 bound for downtown Stuttgart (line destinations *Kirchheim*, *Plochingen*, *Schorndorf* or *Backnang*). At Stuttgart *Hauptbahnhof / Main Station*, change to the U-Bahn line U7 in the direction of *Ostfildern Nellingen* and exit at station *Waldau (GAZI Stadion)*. From there, the dinner location can be reached after a 10-minute walk northward.
3. **By car:** Ample parking is available at the dinner location. Navigate to *Eventlocation Leonhardts* using the address *Jahnstraße 120, 70597 Stuttgart-Degerloch.*

Contact

info@atlas.uni-stuttgart.de

sfb1667.uni-stuttgart.de/VLEOsymposium

Pfaffenwaldring 29, 70569 Stuttgart

The *2nd International Symposium on Very Low Earth Orbit Missions and Technologies* 2025 is hosted by the Collaborative Research Center 1667 ATLAS at the University of Stuttgart, Germany.

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University of Stuttgart
Germany

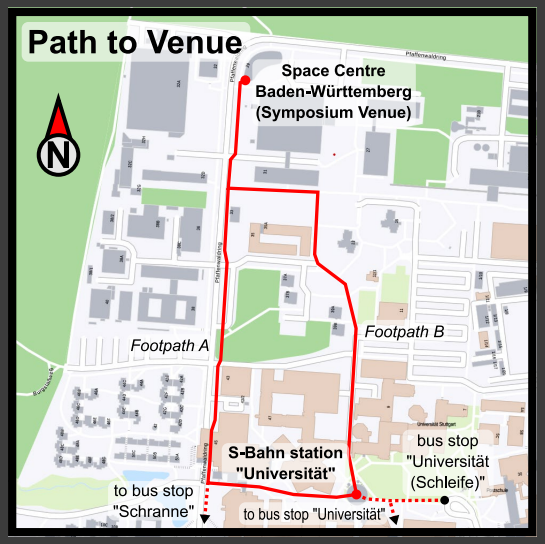
Venue

The symposium is held in the *Space Centre Baden-Württemberg* on the Vaihingen Campus of the University of Stuttgart.

How to get there:

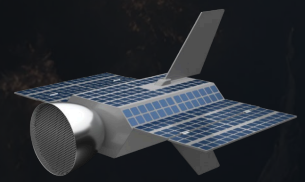
1. **Public transportation:**
   a) ***Coming from main station or downtown Stuttgart:*** Take any of the S-Bahn lines S1, S2 or S3, respectively bound for *Herrenberg*, *Filderstadt* and *Flughafen/Messe* or terminating in *Vaihingen.*
   b) ***Coming from the airport (Flughafen Stuttgart STR):*** Take either of the S-Bahn lines S2 or S3 bound for downtown Stuttgart (destinations *Schorndorf* or *Backnang*).
   c) ***Coming from Stuttgart-Vaihingen:*** Take any of the S-Bahn lines S1, S2 or S3 bound for downtown Stuttgart (line destinations *Kirchheim*, *Plochingen*, *Schorndorf* or *Backnang*).

   Exit at station *Universität* and make your way to the northward station exit (in the direction coming from downtown Stuttgart) and follow either of the footpaths indicated on the map below:



2. **By car:** The venue can be reached easily coming from the Autobahn or downtown Stuttgart. Navigate to *Pfaffenwaldring 29, 70569 Stuttgart-Vaihingen*. Parking spaces are available e.g. along the northward side of the *Pfaffenwaldring* ring road.

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



13 - 14 January 2025
Stuttgart, Germany

University of Stuttgart
Germany

Programme - Monday, 13 January

Time	Event	Speaker(s) / Chair(s)
08:00	*Check-in, Morning Coffee*	
09:00	***Welcome by the Vice Rector for Research and Sustainable Development of the Univ. of Stuttgart***	**Bischoff, M. (Univ. of Stuttgart)**
09:05	***Welcome by the Symposium Chairs***	**Fasoulas, S. (Univ. of Stuttgart) & Roberts, P. (The Univ. of Manchester)**
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 Univ. of Manchester)**
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. (Univ. of Stuttgart)**
10:00	**Technical Session #1: Science Mission Designs and Concepts**	**Stolle, C. (Leibniz Institute of Atmospheric Physics, Kühlungsborn) & Kula Arslan, A. (Univ. of Stuttgart)**
	Mission and System Design for the EarthNext CubeSat VLEO Mission (VLEO2025-1-01)	La Marca, T.A. (Univ. of Naples)
	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 Univ.)
	Skimsat IOD: A VLEO mission platform demonstrator (VLEO2025-1-03)	Cassidy, S. (Thales Alenia Space)
	VLEO Design and development status in SITAEL (VLEO2025-1-04)	Ciolini, M. (SITAEL)
11:00	*Coffee Break*	
11:30	**Technical Session #2: System Design**	**Lappas, V. (Univ. of Athens) & Gutierrez, E. (Univ. Stuttgart)**
	Operational Aspects of an ABEP System for Drag Compensation in VLEO (VLEO2025-2-01)	Walther, M. (Astos Solutions)
	Holistic systems modelling of Very Low Earth Orbits (VLEOs) incorporating Atmosphere Breathing Electric Propulsion (ABEP) (VLEO2025-2-02)	Kent, B. (The Univ. of Manchester)
	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.)
	AERIS-S: Hybrid Air-Breathing and Refuellable Propulsion for Sustainable, Extended Operations from VLEO to LEO (VLEO2025-2-04)	Alao, S. (Stars Edge Ltd.)
12:30	*Lunch Break*	
13:30	***Interactive Session I: Gauging the VLEO Community***	**Crisp, N. (The Univ. of Manchester) & Traub, C. (Univ. of Stuttgart)**
14:00	**Technical Session #3: VLEO Application Scenarios**	**Sneeuw, N. (Univ. of Stuttgart) & Braun, F. (Univ. of Stuttgart)**
	Closer to Earth, Faster in Space: The potential of VLEO for Responsive Space (VLEO2025-3-01)	Bambach, P. (German Aerospace Centre DLR)
	Very Low Earth Orbit Telecommunications Constellations for Non-Terrestrial Network Connectivity (VLEO2025-3-02)	Muirhead, I. (The Univ. of Manchester)
	Optimizing LPWAN-based Satellite Constellations: A Comparative Study of VLEO and LEO Orbits (VLEO2025-3-03)	Lee, C. (Korea Aerospace Univ.)
	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. (Univ. of Colorado)
15:00	**Poster Session Introduction**	**Pagan, A.S. (Univ. Stuttgart)**
15:30	**Poster Session, Long Coffee Break**	***see right-hand-side for list of poster contributions***
16:30	**Technical Session #4: Very Low Earth Orbit Control**	**Flohrer, T. (European Space Operations Centre) & Turco, F. (Univ. of Stuttgart)**
	Development of a Novel CubeSat-scale Air-breathing Electric Propulsion System (VLEO2025-4-01)	Giannetti, V. (Celeste S.r.l.)
	Passive Vapor-pressure Driven Propulsion for CubeSats in Very Low Earth Orbit (VLEO2025-4-02)	Kang, S.J. (United States Naval Academy)
	A high-fidelity orbit propagator and control strategy for VLEO platforms (VLEO2025-4-03)	Gunaltay, H.E. (Univ. of Surrey)
	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 Univ.)
17:30	*Close-out Day 1*	Fasoulas, S. (Univ. of Stuttgart) & Roberts, P. (The Univ. of Manchester)
19:00	Symposium Dinner at *Leonhardts Eventlocation*	

Programme - Tuesday, 14 January

Time	Event	Speaker(s) / Chair(s)
08:00	*Check-in, Morning Coffee*	
08:45	***Guided Tours***	
09:30	**Technical Session #5: Atmosphere-Breathing Electric Propulsion**	**Laufer, R. (Luleå Univ.) & Lee, W. (Univ. of Stuttgart)**
	Analysis and prospect of key factors to improve the performance of Air-Breathing Electric Propulsion system in China (VLEO2025-5-01)	Xia, C. (Beihang Univ.)
	Development of AERIS: Low-energy throttleable VLEO Air-breathing electric propulsion (ABEP) technology (VLEO2025-5-02)	Herrara, A. (Stars Edge Ltd.)
	Air-breathing Electric Propulsion: Testing Approaches and Simulations (VLEO2025-5-03)	Moriconi, B. (Sant'Anna School of Advanced Studies)
	Simulation and Configuration Design of Permanent Magnets applied to an RF Helicon-based Thruster (VLEO2025-5-04)	Papavramidis, K. (Univ. of Stuttgart)
10:30	*Coffee Break*	
11:00	**Technical Session #6: ABEP Plasma Physics**	**Tagawa, M. (Kobe Univ.) & Papavramidis, K. (Univ. of Stuttgart)**
	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)
	Current Progress in the Development of an ECR Plasma Source for Air-Breathing Electric Propulsion System (VLEO2025-6-02)	Šťastný, M. (SpaceLabEU)
	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 Univ. Giessen)
12:00	*Lunch Break*	
13:00	***Interactive Session II: Fostering the VLEO Community***	**Crisp, N. (The Univ. of Manchester) & Traub, C. (Univ. of Stuttgart)**
13:45	**Technical Session #7: Gas-Surface Interactions and Materials**	**Dekorsy, T. (German Aerospace Centre / Univ. of Stuttgart) & Schlitzer, A. (Univ. of Stuttgart)**
	Characterization of RF plasma degradation of Kapton films (VLEO2025-7-01)	Caseiro Jorge, P.D. (von Karman Institute for Fluid Dynamics)
	FEP erosion in VLEO environments: Comparison of ground data and SLATS observations (VLEO2025-7-02)	Tagawa M. (Kobe Univ.)
	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)
	Modelling Surface Roughness in Gas-Surface Interaction for Orbital Aerodynamics (VLEO2025-7-04)	Anton, S.V. (Delft Univ. of Technology)
14:45	*Coffee Break*	
15:00	**Technical Session #8: Particle Simulation Methods**	**Poovathingal, S. (Univ. of Kentucky) & Ellenberger, K.-S. (Univ. of Stuttgart)**
	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)
	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 Univ. of Manchester)
	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)
	Enhanced gas-surface scattering modeling for VLEO satellites in DSMC simulations (VLEO2025-8-04)	Schütte, M. (Univ. of Stuttgart)
16:00	*Coffee Break*	
16:15	**Technical Session #9: Aerodynamic Control**	**Crisp, N. (The Univ. of Manchester) & Tuttas, F. (Univ. of Stuttgart)**
	Maximization of Lift-to-Drag Ratio for VLEO Platforms using Free-Form Deformation Techniques (VLEO2025-9-01)	Agez, B. (ONERA)
	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)
	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)
	Operationalizing Differential Drag Control: A Planning Routine for the S-Net Satellite Formation (VLEO2025-9-04)	Ingrillini, L. (Univ. of Stuttgart)
17:45	*Close-Out*	Fasoulas, S. (Univ. of Stuttgart) & Roberts, P. (The Univ. of Manchester)
18:00	*End of Symposium*	

Poster Contributions

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

All technical sessions and keynotes will be held in the main Auditorium ("Mediathek"). During lunch and coffee breaks, refreshments are provided in the designated catering area ("Boysen Auditorium"). Additional space for breaks and networking is provided on both levels of the Foyer.

Should you have any questions, our staff will be pleased to assist you at the Info Desk (Reception).