CURRENT AND FUTURE WAYS TO CLOSED LIFE SUPPORT SYSTEMS

2025
MELiSSA
CONFERENCE

OCTOBER
7-8-9
PARQUE DE
LAS CIENCIAS
GRANADA
(SPAIN)

PIONEERING A CIRCULAR FUTURE

HANDBOOK

MELiSSA
FOUNDATION

esa

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ABOUT THE 2025 MELISSA CONFERENCE

The MELiSSA Conference is a key event for the scientific, industrial, and institutional community dedicated to the development of closed-loop life support systems, which are essential for long-duration human space exploration. Held regularly since 2012, the conference offers a unique platform for sharing technological and scientific advancements within the MELiSSA Project, with a particular focus on the synergies between space and terrestrial applications.

In 2025, the MELiSSA Conference once again brings together experts, researchers, space agency representatives, and industrial partners to address cross-cutting themes such as circular resource management, regenerative food production, waste treatment, and innovations applicable both in space and on Earth.

The programme includes keynote lectures, parallel sessions, project presentations, thematic panels, technical visits, and dedicated networking opportunities.

The 2025 edition will take place in Granada, Spain, in the heart of Andalusia, one of the country's most vibrant cultural and scientific hubs.

The event is hosted by the Parque de las Ciencias, a leading interactive museum dedicated to science, technology, and the environment. This iconic venue provides an ideal setting for multidisciplinary exchange on space research and sustainability challenges.

Situated at the crossroads of innovation and science outreach, the Parque de las Ciencias features modern facilities, immersive exhibitions, and an inspiring environment that fosters interaction between researchers, engineers, students, decision-makers, and industry stakeholders.

The choice of Granada reflects MELiSSA's commitment to strengthening the ties between science, society, and culture, in a city renowned for its exceptional historical and academic heritage.

ABOUT THE EUROPEAN SPACE AGENCY (ESA)

The European Space Agency (ESA) is the intergovernmental organization responsible for coordinating the space activities of European member states. Its mission is to develop Europe's space capabilities and ensure that investments in space benefit both European citizens and the broader international community.

With over 50 years of expertise in leading space programs, ESA plays a central role in robotic and human exploration, scientific research, Earth observation, telecommunications, and satellite technologies. It is also a driving force in preparations for future human missions to the Moon and Mars through its "Terrae Novae" exploration program.

ESA is the lead agency of the MELiSSA Project, which it has supported for over 30 years, reflecting its commitment to developing autonomous and sustainable life support systems. The agency is actively involved in promoting the project's results, for both space missions and their applications on Earth.

ABOUT THE MELiSSA FOUNDATION

Established in 2014, the MELiSSA Foundation is a non-profit organization committed to supporting research, education, and science communication initiatives related to the MELiSSA Project. It plays a central role in coordinating communication, organizing conferences, and funding PhD and postdoctoral fellowships focused on research into closed-loop life support technologies.

The Foundation also serves as a key interface between the MELiSSA community and industrial stakeholders, facilitating technology transfer and the application of innovations developed within the program. In addition, it supports awareness-raising initiatives promoting sustainable space exploration and ecological transition, particularly among younger generations and educational partners.

Its Board of Directors brings together scientific and institutional figures dedicated to the MELiSSA ecosystem, ensuring the coherence, relevance, and quality of all initiatives undertaken.

08:00 — **REGISTRATIONS**

09:00 — **Opening Ceremony**
Chloé AUDAS (MELiSSA Project Manager, ESA)
Dietmar PILZ (Director of Technology, Engineering and Quality, ESA)
Benoît POUFFARY (Head of Exploration, Preparation, Research and Technology, ESA)
Geraldine NAJA (Director of Commercialisation, Industry and Procurement, ESA)
Juan CARLOS CORTÉS (Director of the Spanish Space Agency, AEE)
Sara GARCÍA ALONSO (Reserve Astronaut, ESA)

10:30 — **Keynote Lecture**
From Low Earth Orbit to the Moon and Mars Horizons: The Evolution of Habitats and Life Support System
Cesare LOBASCIO (Space Exploration and Science Innovation Lead, Thales Alenia Space, Italy)

11:15 — **COFFEE BREAK**

	AUDITORIUM	FARADAY	CINE 3
	Track 1: Eating and Breathing in Space **1.1 Air Revitalisation**	Track 2: Valorising Wastes, Recovering Water and Drinking in Space **2.1 Waste Management, Recycling and Valorisation**	Track 3: Paving the Path to Circular Systems for Space and Earth **3.1 Advanced Life Support Systems Modelling, Simulation and Control**
	Chairs: Carolina Arnau Jimenez (Universitat Autónoma de Barcelona), Fazil Uslu (Beyond Gravity)	**Chairs:** Heleen de Wever (VITO), Dries Demey (Red Wire)	**Chairs:** Philippe Fiani (Sherpa Engineering), Eric Landel (Eric Landel Consulting)
11:45	Photosynthetic Performance of Two Microalgae Species Tested during Ax-3 Mission: Physical and Molecular Dynamics under Microgravity **Berat HAZNEDAROGLU**, Bogazici University, Turkey	Closing the Loop: Innovations in Waste Valorization for Circular by Design Materials and Products **Heather WRAY**, TNO, Netherlands	Advanced Control as a Key to Efficient Multitrophic Food Production – From Earth to Space **Jonathan RAECKE**, Chemnitz University of Technology, Laboratory for Automatic Control and System Dynamic, Germany
12:15	Snow Algae Plasticity and Metabolic Shifts Under Simulated Lunar Light Cycles and Gravity Conditions: Implications for Biological Life Support Systems **Carla RUIZ GONZALEZ**, University of Edinburgh, Scottish Association for Marine Science, UK	Microbial Degradation of Cellulose Containing Waste – a Key Process in Life Support System at Earth and Long-Term Space Missions **Hristo NAJDENSKI**, The Stephan Angeloff Institute Of Microbiology, Bulgarian Academy Of Sciences, Bulgaria	Microclimate in Microgravity: Understanding Canopy-Level Environmental Conditions for the Growth of Soybean in Space **Louise FLEISCHER**, Université Clermont Auvergne / CNES, France
12:30	Exploring Perchlorate Tolerance in Freshwater Microalgae for Martian Applications **Katarína MOLNÁROVÁ**, Mendel University, Czech Republic	Effect of Feeding Regime and pH on the First Compartment of the MELiSSA Loop **Laia VULART**, Universitat Autònoma de Barcelona, Spa	Advanced, Intelligent, and Functional Environmental Control for Managing Regenerative Plant Gas Exchange Fluxes in Bioregenerative Life Support Systems **Alberto BATTISTELLI**, National research council, Italy
12:45	MVIPER – The Magnetohydrodynamic Vortex-Inducing Photobioreactor Experiment **Luisa METTEN**, Technical University of Munich, Germany	Roadmap for Advancements for Menstrual blood Management in reduced gravITY (AMMITY) **Marion DUGUÉ**, ETH Zürich, Switzerland	Sustainable Farming Beyond Earth: Growing Plants Anywhere, Anytime **Georgina RIU PUCHE**, ISAE-SUPAERO, France
13:00	Design and Testing of Cyanobacterium Photobioreactors for Mars In-Situ Resource Utilisation **Guillaume GÉGO**, KU Leuven, Belgium & ZARM, University of Bremen, Germany	The microbiomes of human excrement composting: toward safe human waste cycling for closed-system horticulture **Gregory CAPORASO**, Northern Arizona University, USA	Passive Thermal Module for Space-Based Bioregenerative Life Support Systems **Vincent GARREAU**, The Spring Institute for Forests on the Moon, France
13:15	Optimisation of Plasmas Assisted Oxygen Production for Mars with Transfer Learning **Tarek BEN SLIMANE**, Instituto Superior Tecnico, Portugal	The Potential of Insects in Bioregenerative Systems for Space **Angiola DESIDERIO**, ENEA, Italy	

13:30 — **LUNCH**

	AUDITORIUM	FARADAY	CINE 3
14:30	Potential for CO_2 Fixation and Novel Food Production in Purple Non-Sulphur Bacteria: Exploratory Study in Low-Cost Bag Photobioreactors under Controlled and Resource-Scarce Analog Conditions **Guillaume GÉGO**, University of Mons (UMONS), Belgium	Bioconversion of Plastic Waste into Edible Protein: A Bio-Inspired Solution for Circular Life Support in Space **Nathalie BEREZINA**, Norbite (NBTech AB), Sweden	Modelling Nutrient Dynamics in Hydroponic Lettuce Production using Source-separated Urine **David WEISSBRODT**, Norwegian University of Science and Technology, Norway
14:45	Adaptive Laboratory Evolution of Cyanobacteria for Perchlorate Resistance in the Context of Martian ISRU **Lucie THIBAUD**, ZARM, University of Bremen, Germany	From Plant Biomass and Sidestreams to Tissue Engineering and Biocomposite Production **Sophie LABONNOTEWEBER**, NTNU Samfunnsforskning, Norway	Design Options for a Lunar Greenhouse Module using the SERENITY Methodology **Lucie POULET**, Université Clermont Auvergne, France
15:00	Aquatic Mosses for Bioregenerative Life Support Systems in Space: A Study on Radiation Tolerance and Biofiltering Potential **Chiara AMITRANO**, Università degli Studi di Napoli Federico II, Italy	Integrating Microbial Radioresistance into the MELiSSA Loop: A Pathway Towards Opportunistic Radiation Shielding for Deep Space Exploration **Guillaume GÉGO**, HRE-HS, ESA-ESTEC, The Netherlands	Heat and Mass Transfer Studies using Leaf Replicas for Future Space Plant Systems: Effects of Angle, Airflow and Gravity **Joanna KUZMA**, Université Clermont Auvergne, France
15:15	Influence of Atmospheric Pressure and of the Partial Pressures of Carbon Dioxide and Dinitrogen on the Productivity and Mass-Efficiency of Biological ISRU Systems Based on Diazotrophic Cyanobacteria **Cyprien VERSEUX**, ZARM, University of Bremen, Germany	Hydroponic Crop Production with High Nutrient Use Efficiency from Organic Waste for Space Applications **Icíar GIMENEZ DE AZCARATE BORDONS**, ETH Zurich, Switzerland	Data Management Strategies within the MELiSSA Plant Characterization Unit **Carlos BATHICH**, Université Clermont Auvergne, France
15:30	DRAFT: Dynamic Regolith Air Filtration Technology **Álvaro ROPERO LÓPEZ**, The Spring Institute for Forest on the Moon, France	Persistence of Foodborne Pathogens in Hydroponic Lettuce Cultivated on Urine-derived Nutrients **David WEISSBRODT**, Norwegian University of Science and Technology, Norway	MELiSSA System Study – Full Loop Model Integration and What-if Scenario Simulations **Marco GATTI**, Enginsoft, Italy
15:45	Oxygen Separation Technology for the PaCMan PCU – Overview and Future Perspectives **Erik MAZZOLENI**, Enginsoft, Italy	Microbial Electrochemical Cell Integration in the MELiSSA Loop: Enhancing Carbon Conversion for Improved Waste Treatment **Florent BOUCHON**, UGent-CMET, Belgium	Advancements in ESA's ALISSE Tool: Development of Version 2 and Roadmap Towards a Comprehensive ECLSS Evaluation Framework **Thomas FILI**, Thales Alenia Space, Italy
16:00	Assessment of Airflow, CO2 Accumulation and Thermal Stress in Lunar Modules Using CFD **Margarita BELALI**, National Technical University of Athens, Greece	Degradation of Surfactants and Microbial Community Succession in Anaerobic Membrane Bioreactor for Hygiene Wastewater Treatment in Controlled Ecological Life Support Systems **Libing ZHENG**, Research Centre for Eco-Environmental Sciences, Chinese Academy of Sciences, China	Benchmarking ALSSAT with ALiSSE: Aligning Life Support System Optimization with Ecosystem Efficiency and Closed-Loop Sustainability **Chukwuemeka UKAGA**, TU WIEN, Austria
16:15	Probing the Timescales of Cyanobacterial Photoprotection, **Michal GWIZDALA**, Barcelona Institute of Science and Technology, Spain		Quantitative Water System Model for Local Decision Making and Circularity: the Caux Seine Territory Case Study **Luke PILACHE**, CentraleSupélec – Industrial engineering lab, France
16:30			A Computational Study and Biosafety Assessment of a Hybrid Microbial Fuel Cell and Compost Heat Recovery System for Decentralized Rural Energy Applications **Gianandrea SCALA**, Università di Siena, Italy
16:45	POSTER SESSION AND COFFEE BREAK		

AUDITORIUM

17:30 — **Keynote Lecture**
Málaga TechPark: A Unique Innovation Ecosystem Accelerating Sustainability
Sonia PALOMO (Director of Technology Transfer and International Relations, Málaga Techpark, Spain)

EXHIBITION

17:30 — **"Touch the Sky – Explore Space"**
Conference participants will have free access to the "Touch the Sky" exhibition, provided they wear their badge clearly visible at all times. Please note that two areas inside the Museum, the Astronomical Planetarium and the Biodomo Pavilion, require separate tickets.

DAY 2

	AUDITORIUM	FARADAY	CINE 3
08:00	**NETWORKING MEETINGS (AS NEEDED BASIS)**		
09:00	**Keynote Lecture** Power-2-Food using Green Acetate and Microorganisms **Martin PERSSON** (Manager of Fermentation Technology, Novonesis, Denmark)		
	Track 1: Eating and Breathing in Space **1.2 Plant Characterisation**	Track 2: Valorising Wastes, Recovering Water and Drinking in Space **2.2 Wastewater Treatment, Water Recovery and Drinking in Space**	Track 3: Paving the Path to Circular Systems for Space and Earth **3.2 Space Demonstrators and Ground Analogues**
	Chairs: Lucie Poulet (Université Clermont Auvergne), Lucie Thibaud (ZARM)	**Chairs:** Korneel Rabaey (University of Gent), Siegfried Vlaeminck (University of Antwerp), Kai Udert (Swiss Federal Institute of Aquatic Science and Technology, EAWAG), Cyprien Verseux (University of Bremen)	**Chairs:** Natalie Leys (SCK-CEN), Anaïs Llodra-Perez (MEDES-IMPS – Innovation Project Coordinator)
		Safe Water to Drink	
09:45	Can Plants Grow Upright in Space? Mechanisms Underlying Stability and Root Anchorage **Valérie LEGUÉ**, Université Clermont Auvergne, France	Risk-based Treatment and Monitoring of On-site Water Reuse on Earth **Eva REYNAERT**, German Environment Agency, Germany	MELiSSA Pilot Plant: Contributing to MELiSSA Loop Closure **Carolina ARNAU JIMENEZ**, MELiSSA Pilot Plant – Universitat Autònoma de Barcelona, Spain
10:15	Angle Dependence in the Plant Gravitropic Response **Marta DEL BIANCO**, Italian Space Agency, Italy	Snow's Eye Measurement Suite: a Modular Acoustic-Radar–Spectroscopic Payload for Quantitative and Compositional Water-ice Reconnaissance in Support of MELiSSA Life-Support and ISRU Systems **Jan MIKOLAJCZYK**, University of Warsaw, Poland	EDEN LUNA – Science and Technology Demonstration Platform **Vincent VRAKKING**, German Aerospace Center, Germany
10:30	Not Only Roots: Plant Response to Gravity Stimulus to Retain Flower Orientation **Giovanna ARONNE**, University of Naples Federico II, Department of Agricultural Sciences, Italy	Antimicrobial Coating: Protecting and Improving Human Space Flights **Filiz EMIRLI**, NTNU / Spectrum Blue, Norway	Mapping the Paths of Human Space Exploration, a Life Science Prospective **Marta DEL BIANCO**, Italian Space Agency, Italy
10:45	Altered Gravity Effects on Pollen Germination and Tube Growth: Species Selection for Experimental Models in the FLOS Project **Luigi Gennaro IZZO**, University of Naples Federico II, Italy	Water Recovery from Aerosol Streams with an Eye to Microgravity **Giuseppe BARBIERI**, Consiglio Nazionale delle Ricerche – Istituto per la Tecnologia delle Membrane, Italy	Lunar Agriculture Module Ground Test Demonstrator (LAM-GTD) – an International Effort to Develop a Full-scale Testbed for Bio-regenerative Life Support, including Canada's Role in the Lunar Agriculture Module – Ground Test Demonstrator **Michel Fabien FRANKE**, German Aerospace Center (DLR) **Jared STOOCHNOFF**, Canadia Space Agency (CSA)
		From Water to Food	
11:00	Are There Main Trends in Plants' Responses to Ionizing Radiation? **Veronica DE MICCO**, University of Naples Federico II, Dept. Agricultural Sciences, Italy	Noble Rot Wine Pills **Elena LUCIANI**, Università Campus Bio-Medico di Roma – Scienze dell'Alimentazione e della Nutrizione Umana, Italy	
11:15	**COFFEE BREAK**		
		From Water to Food (continued)	
11:45	Real-time Thermal Imaging of Leaf Temperature to Explore Plant Transpiration and Leaf Boundary Layer Effects on Ground and in Microgravity **Øyvind JAKOBSEN**, CIRiS, NTNU Samfunnsforskning AS, Norway	Perception of Green Juice Under Simulated Immersive Earth and Space Environments for the Design of Palatable Space Compatible Beverage **Lydia ONG**, Centre of Excellence in Plants for Space, The University of Melbourne, Australia	Bioregenerative Life Support Systems for the Moon: Italy's Pioneering Project Supported by the Italian Space Agency **Micol BELLUCI**, Italian Space Agency, Italy

12:00	Watermeal as a Resilient Nutrient Source for Space Farming: Omics-based Insights into Gravity-driven Adaptation for Closed Life Support Systems **Tatpong TULYANANDA**, Mahidol University Faculty of Science, Thailand	Lettuce Cultivation in a Urine-Fertilizer Scenario: Exploring Sodium Tolerance and Acclimation **Mona SCHIEFLOE**, CIRiS- Centre for Interdisciplinary Research in Space, NTNU Samfunnsforskning AS, Norway	Radiobiome: Host-Gut Microbiome Functional Resilience to Radiation **Michaela WALSH**, University College Dublin, Ireland
12:15	Stress Response of Hydroponically Cultivated Kale (Brassica oleracea) to Sodium Chloride and the Potential Mitigation Effect of Co-cultivation with Saltwort (Salsola Komarovii) **Kaia MACLEOD**, NTNU, Norway	Lettuce Cultivation Based on Urine-Derived Fertilizer – In-Situ Resource Utilization of Calcium Oxide for pH Control and Calcium Supplementation in Hydroponics **Anja JENNER**, Centre for Interdisciplinary Research in Space (CIRiS), NTNU Samfunnsforskning AS, Norway	Running a Photobioreactor in Space for the Production of Oxygen and Edible Spirulina Biomass **Natalie LEYS**, Belgian Nuclear Research Center SCK CEN, Belgium
12:30	Impact of Super-Elevated CO2 Concentration on Biomass and Oxygen Production of Kale Cultivated in the Higher Plant Chamber of the MELiSSA Pilot Plant **Enrique PEIRO**, MELiSSA Pilot Plant – Universitat Autònoma de Barcelona, Spain	Simulated MELiSSA C3 Effluent as Sole Nitrogen Source for Kale and Lettuce Cultivation in a Closed-loop Hydroponic System (C4b) **Stefania COZZOLINO**, Department of Agricultural Sciences – University of Naples Federico II, Italy	Operation of Biolab for Human Spaceflight Applications at the Microgravity User Support Center (MUSC) **Katharina HILDEBRANDT**, German Aerospace Center, Germany
12:45	Custom Light Engines for the PaCMan Plant Characterization Unit: a Replicable Design Pathway for Upgrading Photobiological Systems in Space Research **Piero SANTORO**, MEG Science, Italy	LunarPlant: Human Waste Utilization in Hydroponic Systems for Cultivation of Leafy Greens in Space **Ann-Iren KITTANG**, NTNU Samfunnsforskning AS, Dept. CIRiS, Norway	Miniaturized and Monitored growth chambers for Cyanobacteria Culture in Space: MIMOCYCS **Eva CREUS OLEART**, SENER Aeroespacial, Spain
		Wastewater Treatment	
13:00	The Use of the Plant Characterization Unit for Investigating Crop Sub-Optimal Mineral Nutrition **Emmanuel FROSSARD**, ETH Zurich, Swizterland		Hardware Development for the BASIC ISS Experiment and Planned InFlight and Post-Flight Data Collection **Solène WURTZ PRA**, Université Clermont Auvergne, France
13:15	**LUNCH**		
		Wastewater Treatment (continued)	
14:15	Studying the Effects of Mycorrhizal Symbiosis in a Simulated Lunar Environment under Differing Gravity Levels **Andreas GUÐMUNDSSON** GÄHWILLER, University of Iceland, Iceland	TBC **Sebastia PUIG**, Universitát de Girona, Spain	The Space Omics Spaceflight Related Results and Simulated Microgravity Facilities Provided to the Space Biology, Life Support Systems and Astrobiology Communities in Spain **Raul HERRANZ**, CIB Margarita Salas (CSIC), Spain
14:30	Effect of Bio-stimulation from Limnospira Indica on Microbiome Modulation and Plant Resilience **Cécile RENAUD**, University of Mons, Belgium		Centralized Testing Facility for Space Food Production, Handling, and Bioregenerative Processes **Tor BLOMQVIST**, German Aerospace Center (DLR), Germany
14:45	Use of Microalgae and Cyanobacteria from BLSS as Fertilisers for Lunar and Martian Regolith Simulants **Izabela ŚWICA**, University Warmia and Mazury, Poland	Removal of Organic Acids for Life Support Systems in Space using a Synthetic Microbial Community in a Microbial Electrolysis Cell **Korneel RABAEY**, Ghent University, Belgium	TBC **Anais LLODRA-PEREZ**, MEDES, France
15:00	Enhancing Performance, Stability, and Resilience of Lunar Bioregenerative Life Support Systems through Intercropping Strategies **Antonnio PANNICO**, Department of Agricultural Sciences, University of Naples Federico II, Portici, Italy	Simulation of a Constructed Wetland for Wastewater Treatment on the Moon or Mars **Patrick GROVE**, The Spring Institute for Forests on the Moon, France	A two weeks, sealed study in bioregeneration at Biosphere 2, **Kai STAATS** , Arizona University, USA

DAY 2

	AUDITORIUM	FARADAY	CINE 3
	Track 1: Eating and Breathing in Space **1.3 On-Board Food Production and Preparation**	Track 2: Valorising Wastes, Recovering Water and Drinking in Space **2.2 Wastewater Treatment, Water Recovery and Drinking in Space**	Track 3: Paving the Path to Circular Systems for Space and Earth **3.3 Terrestrial Applications**
	Chairs: Stefania de Pascale (University of Naples Federico II), Giorgio Boscheri (Thales Alenia Space Italia))	**Chairs:** Korneel Rabaey (University of Gent), Siegfried Vlaeminck (University of Antwerp), Kai Udert (Swiss Federal Institute of Aquatic Science and Technology, EAWAG), Cyprien Verseux (University of Bremen)	**Chairs:** Jeremy Pruvost (University of Nantes), Antoinette Kazbar (University of Wageningen)
		Urine Processing	Process Development for Waste Valorisation
15:15	MOONRICE: Cereal Crop Production for Future Planetary Base **Marta DEL BIANCO**, Italian Space Agency, Italy	An Integrated System for Water and Nutrient Recovery to Enable Sustainable Space Habitation **Alaa KULLAB**, Hydromars AB, Sweden	Enabling Microbial and Microalgal Functional Ingredients for Terrestrial and Space Applications **Iulian BOBOESCU**, Wageningen University, the Netherlands
15:30		Nitrify for life: Sustainable Solutions for Space and Earth **Siegfried VLAEMINCK**, University of Antwerp, Belgium	
15:45	Liquid Management in Space (LiMiS): Innovations in Microgravity Food Production **Sophie LABONNOTE-WEBER**, NTNU Samfunnsforskning, Norway	From Mineralized Urine to Balanced Nutrient Solution for Crop Cultivation: Long-Term Supplementation Strategies and Nutrient Solution Dynamics **Øyvind JAKOBSEN**, CIRiS, NTNU Samfunnsforskning AS, Norway	Fogponics in the Loop: Developing and Testing a Nutrient Delivery System for Bioregenerative Space Agriculture **Siert HAMERS**, Delft University of Technology, the Netherlands
16:00	Development Status and Test Results of JAXA's Plant Growth Unit for Advanced Cultivation Experiments **Dylan Shun IZUMA**, Japan Aerospace Exploration Agency (JAXA), Japan	On-Site Resource Recovery from Urine with Zero-Waste Discharge: Challenges on the Way from a Process to a Product **Michel RIECHMANN**, EAWAG / OGMO, Switzerland	Microbially Driven Electro-Filtration for Recovery of Energy, Water and Nutrients: Transforming Urine into Bio-Fertiliser for Growing Plants in Space Missions **Iwona GAJDA**, University of the West of England, United Kingdom
16:15	SELENE **Giorgia PONTETTI**, G & A Engineering S.r.l., Italy	Towards a More Representative Synthetic Urine: Inclusion of Organic Compounds and Validation of Their Conversion During Anaerobic Storage **Nele KIRKERUP**, EAWAG / ETH Zurich, Switzerland	INCITE – Innovative Ionic Liquid-Enzyme Tandems for Enhanced Biomass Degradation **Antonielle MONCLARO**, CMET/ Ghent University, Belgium
16:30	MICROx2: A Microgreens Greenhouse for Lunar Surface Missions **Giorgio BOSCHERI**, Thales Alenia Space, Italy	Urea Hydrolysis, Nitrification and COD Removal of Synthetic and Human Urine in a Continuous Packed-Bed Bioreactor with a Defined Microbial Community at the Melissa Pilot Plant **Queralt FARRÀS**, Universitat Autònoma de Barcelona, Spain	Gravity-Adaptive Wolffia (Water Lentils) For Bioregenerative Life Support Systems: A Three-Year Multi-G Study and its Application to Terrestrial Cultivation Technology **Leone Ermes ROMANO**, Department of Agricultural Sciences, University of Naples Federico II, Italy
16:45	Space-Fed, Space-Ready: Innovations in Astronaut Nutrition and Extraterrestrial Agriculture, **Patrick GROVE** (on behalf of Borja BARBERO), Moon Village Association, United States	Enhancing The Conversion of Organics in Urine Treatment with a Synthetic Community Through Genomic Screening Targeted for Creatinine-Degrading Bacteria **Patricia GUTIÉRREZ LOZANO**, University of Antwerpen, Belgium	**Angelo Vermeulen**

	AUDITORIUM
17:00	**Poster Pitch Contest**
18:30 **20:00**	COFFEE BREAK
17:30	**Round Table Event : Art for Space** moderated by **Marc OBÉRON** (Founder of Cinema for Change International Film Festival, France)
18:00	**Keynote Lecture** Research Progress on Bioregenerative Life Support System (BLSS) by "Lunar Palace-1" Team **Hui LIU** (Lunar Palace 365 Experiment Captain, Beihang University, China)
18:30 **20:00**	FREE TIME
20:00 **23:00**	**Gala Dinner** – Barceló Granada Congress

AUDITORIUM

08:00 — YOUNG PROFESSIONAL NETWORK EVENT

09:00 — **Keynote Lecture**
Integration of Biological Life Support Systems into Future Human Space Missions
Michael T. FLYNN (Advanced Water Recycling Group Lead, NASA Ames Research Center, USA

	AUDITORIUM		CINE 3
	Track 1: Eating and Breathing in Space **1.3 On-board Food Production and Preparation**	**Networking Meetings (as needed basis)**	Track 3: Paving the Path to Circular Systems for Space and Earth **3.3 Terrestrial Applications**
	Chairs: Stefania de Pascale (University of Naples Federico II), Giorgio Boscheri (Thales Alenia Space Italia)		**Chairs:** Jeremy Pruvost (University of Nantes), Antoinette Kazbar (University of Wageningen)
			Process Development for Waste Valorisation (continued)
09:45	KEETA: A Novel Development of Self-Sustainable Insect-Based Protein and 3D Food Production System for Crewed Deep Space Missions **Chanud SITHIPREEDANAN**, Chulabhorn Royal Academy. Thailand		The various applications and development of ESA greywater recycling technology, **Pierre MAGNES**, FIRMUS, France
			Technology Transfer for Terrestrial Applications
10:00	Results From ESA OSIP Activity: Deep-Space Food Production Based on Single-Cell Protein Production by Means of Gas Fermentation **Kim KUTVONEN**, Solar Foods Oyj, Finland		New Space Economy: Value Creation Avenues for the Agri-Food Industry **Catherine THANNIPPILLY ALEX**, ESA BIC Baden Württemberg, Germany
10:15	MELiSSA Feeder: Biomass Harvesting System for Food Preparation **Rastislav KRAMPL**, BioX Technologies, Slovakia		Technology Transfer of The Nutrient Harvester: From Research to an On-Site Urine Resource Recovery Product **Michel RIECHMANN**, EAWAG / OGMO, Switzerland
10:30	Limnospira – Lipidom and Pathways **Rastislav KRAMPL**, BioX Technologies, Slovakia		Waterneutral and Sewageless Buildings **Peter SHEER**, SEMiLLA SANITATION, the Netherlands
			Closed-loop Projects for Spatial Applications
10:45	Fast 2D NMR for Deciphering Lipidic Extracts of Microalgae **Iris HALLEGOUET**, CEISAM laboratory of Nantes Université, France		Research Towards a Novel Biomanufactory-Based BLSS System Using Giant Reed (Arundo Donax) as a Multifunctional Clonal Propagated Biotech Space-Plant Candidate **Orsolya MEIER**, University of Debrecen, Hungary
11:00			TICTACS: A Fresh Perspective on Closed Ecological Systems through Citizen Science **Patrick GROVE**, The Spring Institute for Forests on the Moon, France
			Closed-loop Projects for Spatial Applications (continued)
11:15	Luna Rapa **Giorgia PONTETTI**, G & A Engineering S.r.l., Italy		The Body Gardeners **Frederik DESCHUYTTER**, Belgium
11:30	Texture in Space: Exploring the Sensory Dimensions of Cream Cheese for Optimal Astronaut Nutrition **Claudia GONZALEZ VIEJO**, University of Melbourne, Australia		Exploring the Efficacy of Bioregenerative Life Support Systems: Space-Derived Innovations for Climate-Resilient Agri-Food Systems on Earth **Catherine THANNIPPILLY ALEX**, Infinite Roots, Germany

		ESA Terrestrial Applications Activities
11:45	Future Foods for Future Space Flights: 3D Printing Solutions for Astronaut Meal Diversity to Combat Menu Fatigue **Sigfredo FUENTES**, University of Melbourne, Australia	20 Years of Real-life operations of the MELiSSA GWTU at Concordia Station, Antarctica **Nina PURVIS**, European Space Agency
12:00	Towards Cooking in Space Conditions: the Development of an Innovative Cooking Processor to Produce Fresh Food in Space for Long Duration Missions (the TasteInSpace project) **Dorothée GOFFIN**, University of Liège, Smart Gastronomy Lab, Belgium	Inspiring the Next Generation: Life Support Systems Solution from Space for Earth Training Course **Elena Maria CAMPANARO**, ESA/ESTEC, the Netherlands
12:15		From orbit to Earth: Bioregenerative systems for sustainable food and water in space and on Earth **Riccardo CAPOLLA** / Fabio MAGRASSI, STAM srl, Italy
12:30		ESA BASS Programme Opportunities **Arnaud RUNGE**, ESA/ESTEC, the Netherlands
	AUDITORIUM	
12:45	**Keynote Lecture** Circular Approaches in Terrestrial Applications and Management of Complex Microbial Communities **Martin HARTMANN** (Senior Scientist in Microbial Ecology and Sustainable Agriculture, ETH Zurich, Switzerland)	
	AUDITORIUM	
13:30	**Closing Ceremony** Organized by the MELiSSA Foundation **Robert LINDNER** (Head of Life Support and Physical Sciences Instrumentation Section, ESA)	

The content of the presentations was provided by the Key speakers and Speakers.

Prof. Paola ADAMO

SPEAKER

Paola Adamo is Full Professor of Agricultural Chemistry at the Department of Agricultural Sciences, University of Naples Federico II. Her main research areas include the speciation, mobility, and bioavailability of nutrients and heavy metals in degraded and polluted soils, soil-plant interactions, and their effects on nutrient biogeochemical cycling, as well as the authenticity and traceability of high-quality agro-products. She served as President-Elect (2019- 2020) and Past-President (2021-2022) of the Italian Society of Soil Science. She was involved in the REBUS project "Insitu REsources Bio-Utilisation for Life Support Systems in Space," funded by the Italian Space Agency from 2019 to 2022. She is currently involved in several research projects, including AQUASERV (www.aquaserv-ri.eu), METROFOOD-IT (www.metrofood.it), the National Center for Technology in Agriculture – AGRITECH (www.agritechcenter.it), the National Biodiversity Future Center – NBFC (www.nbfc.it), and the Center for future Sustainable Agri-food Systems – RESTART. She has published 147 peer-reviewed articles in ISI-JCR journals, with an H-index of 47 and over 6150 citations.

Dr. Chiara AMITRANO

SPEAKER

Chiara Amitrano is a Researcher in Environmental and Applied Botany at the Department of Agricultural Sciences, University of Naples Federico II. Her expertise lies in plant–environment interactions, with a focus on the coupling between photosynthesis and hydraulics through structure–function relationships. She has also explored the effects of space-related factors (particularly ionizing radiation) on plant performace. During her Ph.D., she spent six months at the aerospace company Kayser Italia Srl, gaining experience in defining requirements for plant cultivation facilities in space environments. She was also a visiting scholar at the University of Arizona, where she conducted vertical farming experiments and investigated crop production under microgravity, addressing challenges related to water and nutrient delivery. Currently, Dr. Amitrano is the Principal Investigator of the ESA-funded MOM (Moss on Mars) project, which examines the effects of ionizing radiation on aquatic bryophytes. She also leads Work Package 2103 (Data Integration and Modeling) in the ASI-funded Bioluna project and has been involved in several other space biology projects over the past six years. In 2025, Dr. Amitrano spent four months as a Fulbright Visiting Researcher at California State University, Los Angeles, working with Dr. Christina Scoffoni on plant hydraulics. Bibliometric indices Scopus (14/05/2025): Documents:34, H-index: 14, Citations: 535

Dr. Carolina ARNAU JIMENEZ

KEY SPEAKER

Carolina Arnau was born in Barcelona, Spain. She is currently working in the MELiSSA Pilot Plant (MPP) as a Technical Coordinator. She is in charged of keep running the pilot compartments and contributing in their Integration to fulfil with the complete closure of gas, liquid and solid phases of all MELiSSA compartments. She finished her bachelor's in chemical engineering in 2005 in Universitat Autonoma de Barcelona. In 2011, she finished her PhD in the Biotechnology field. In her my PhD, she developed an Optimized Production system for Heterologous proteins using yeast as a host in a continuous and fed-batch operation modes. After completing her PhD, she started a position as Junior Bioprocess Engineer in the MELiSSA Pilot Plant. She was mainly focussed on the Nitrifying Compartment. After some years involved in the project, she started working in other compartments as the photobioreactors compartments and continuously progressing in the integration of several phases of the compartments. In 2018, she started a new position in the MELISSA Pilot Plant as a Technical coordinator. From then on, the MPP is progressing in the grown demonstration of the MELISSA loop, integrating all compartments (all phases) in other to fulfil 100% of a human oxygen needs and 40% of its diet for long term testing campaigns.

Giovanna ARONNE

SPEAKER

After graduating in Agricultural Sciences at the University of Naples and a PhD in Plant Science at the University of Aberdeen in Great Britain, she returned to Italy and started her university career becoming full professor of Environmental and Applied Botany. Most research is concerned with the reaction of plants to changes in environmental factors, including space. Among these, particular attention is paid to plant-microgravity interactions and theri effects on plant growth and reproduction. She has been, and still is, responsible for numerous research projects on space plant biology in collaboration with ASI, ESA and NASA, and including experiments also on the ISS.

Chloé AUDAS

KEY SPEAKER

Chloé Audas is the MELiSSA Project Manager at the European Space Agency, with more than 10-year experience in human space exploration. Chloé Audas graduated with an MSc in Aerospace Engineering and and MSc in Biomedical Engineering from the French Engineering School ISAE-SUPAERO and Imperial College London respectively. Her theses focused on the adaptation of the human cardiovascular system in microgravity. After working for the French Space Agency (CNES) and Thales Alenia Space, Chloé Audas joined ESA in 2016. In her first role she supported ESA's scientific activities onboard the International Space Station. In 2021, Chloé became an Environmental Control and Life Support System Engineer within the MELiSSA Project. In 2023, Chloé Audas took over the reins of MELiSSA Project management from Christophe Lasseur.

The content of the presentations was provided by the Key speakers and Speakers.

Dr. Borja BARBERO

SPEAKER

Dr. Borja Barbero Barcenilla is a distinguished scientist specializing in synthetic biology and genome engineering. He currently serves as the research coordinator for the NASA Genelab plant Working Group (AWG). Dr. Barbero Barcenilla's expertise extends to spaceflight operations, as evidenced by his involvement in NASA's SHINE-1 and STAR-4 programs. As a member of BioAstra CREW-2, Dr. Barbero Barcenilla has contributed to advancing space biology research. His hands-on experience includes working on space biology experiments, notably the Apex-07 mission. He is also slated to participate in the upcoming Apex-12 project, which will involve experiments on the International Space Station (ISS) as well as galactic cosmic rays experiments at Brookhaven National Laboratory. Dr. Barbero Barcenilla's research portfolio includes groundbreaking work in cultivating various plant species using lunar regolith, demonstrating his innovative approach to space agriculture.

Dr. Giuseppe BARBIERI

SPEAKER

Giuseppe BARBIERI research director at ITM-CNR (www.itm.cnr.it), has a master degree in chemical Engineering – with honours - PhD in "Chemical and new materials technologies" and a National Scientific Qualification of University Full Professor in Chemical Plants and Technologies. Main research interests are covering the fundamentals, mass transport and engineering in membrane operations for the treatment of gas, vapors, aeriform, liquid and aerosol streams of industrial relevance/interest (containing, H2, CO, CO2, N2, CH4, HCs, water vapor, acid, basis, contaminant, etc.) and conversion (hydrogen production and upgrade, DME and CO2 reduction/utilization, etc.) He is/was invited professor at the "Université de Strasbourg (France, since 2010), contract professor at the University of Calabria (Italy), responsible for 15 research and formation projects, including the coordination of EC/FP7-FCH JU LoLiPEM and M.era- NET BioValue, and participated in others (ca. 20) research and formation projects funded by the EC, MAECI, MIUR, CNR, the Calabria Region, Norwegian Research Council, and private companies. He serves as scientific and/or technical evaluator of research and industrial projects for funding institutions such as European Commission (several actions), MIUR and MiSE (Italy), RPF (Cyprus), FWO and Katholieke Universiteit Leuven (Belgium), The Petroleum Research Fund (USA), Programa FONDECYT CONICYT (Chile), etc. He also served as evaluator for a tenure track position in the framework of Italian MIUR "Rita LEVI MONTALCINI" action for a University positions. He co-authored more than 130 papers, a two-books set for Royal Society of Chemistry and its second edition, various books chapters, invited lectures and seminars, and > 300 presentations at conferences on membrane science and engineering. Orcid: 0000-0001-5583-8634, WoS researcher ID: "A-8134-2011"; Scopus Author ID: 7004852966

Dr. Carlos BATHICH

SPEAKER

Carlos Bathich holds a PhD in Bioinformatics from Lille University and is currently pursuing a postdoctoral fellowship at Clermont Auvergne University. His research focuses on data analysis for the PaCMan (Plant Characterization Unit for Closed Life Support System – Maintenance, Subsystem Integration, Review, and Scientific Deployment) project. He is responsible for processing, curating, and utilizing the data to develop mechanistic models of plant growth in Bioregenerative Life Support Systems.

Alberto BATTISTELLI

SPEAKER

1986 - Present: Permanent position at the National Research Council of Italy (CNR). Current position: Director of Research.
2002 - 2010: Lecturer in Plant Physiology, Job-Oriented Biotechnology course, University of Perugia.
2020 - Present: Contract Professor, University of Tuscia Viterbo, Italy, teaching Botany and Plant Physiology. Research
Interests: Dr. Battistelli's research focuses on crop and forest plant adaptation and acclimation to environmental factors, including responses to temperature, light (quantity and quality), CO2 partial pressure, microgravity, and nutrient availability. His work also investigates plant responses to abiotic stress factors such as drought, salinity, temperature extremes, and light. A significant part of his research addresses the agronomic, physiological, and biochemical control of plant product quality, particularly in relation to human nutrition and biorefining. He collaborates with small, medium, and large industries in the fields of space biology, food quality, and biorefining.

Relevant Work Experience:

- Participated in two plant growth experiments aboard the International Space Station (ISS) during the ENEIDE Mission with astronaut Roberto Vittori, in collaboration with the University of Tuscia.
- General Coordinator (2011-2013) of the international project "Inflatable Greenhouse for Space Plant Food Production and Life Support", funded by the Italian Ministry of Foreign Affairs

Participants:

- CNR, University of Arizona, Aerosekur SpA, Thales Alenia Space Italia, Sadler Machines.
- Main Contact Person for CNR and Coordinator of the "Food Quality and Safety" activity for the EDEN-ISS Project. Grant agreement ID: 636501
- CNR Scientific Manager for the contract with the University of Naples Federico II for research activities in the MELiSSA Project – Food Characterization Phase I.
- Scientific Coordinator for CNR's participation in the In-situ Resource Bio-Utilization for Life Support Systems (ReBUS) project, funded by the Italian Space Agency (ASI).
- Scientific Coordinator for CNR's involvement in the Systems and Technologies for the Production of Microgreens in Space (MICROx2) project, funded by the Italian Space Agency (ASI).
- Co-coordinator of the ASI working group for the ASI roadmap on Bioregenerative Life Support Systems.
- Scientific Coordinator for CNR's involvement in the project "Biology and Artificial Intelligence for Life Support on the Moon - BIOLUNA.
- Author of over 100 publications in peer-reviewed scientific journals, books, and presentations at international conferences.
- ORCID ID: orcid.org/0000-0002-8613-4688
- Google Scholar: https://scholar.google.com/citations?user=KnbHuDsAAAAJ&hl=en&oi=ao
- ResearchGate: https://www.researchgate.net/profile/Alberto-Battistelli

Margarita BELALI
SPEAKER

Margarita Belali - author : is a multidisciplinary engineer specializing in Computational Mechanics, Space Systems, and Civil Engineering. She is currently pursuing an MSc at the National Technical University of Athens and holds degrees in Space Science, Technologies & Applications and Civil Engineering. Currently, she teaches engineering subjects at the Vocational Institute Omhros and Poukamisas Educational Group in Athens. Gianandrea Scala - co - author:Gianandrea Scala is a medical student at the University of Siena with a strong interdisciplinary background in cellular biology, microbiology, and bioethics. He has attended advanced training programs at Scuola Superiore Sant'Anna, Scuola Normale Superiore, and the Luigi Lagrange School of Scientific Education, focusing on biomedical sciences, astrochemistry, and scientific communication.

Dr. Micol BELLUCCI
SPEAKER

She graduated in Biological Sciences (Biotechnology) at the University of Rome "La Sapienza" in 2005. In 2010 she obtained a PhD in Environmental Engineering at Newcastle University (UK). Since then, she had been working as a researcher on biological processes (nitrification, anaerobic digestion, anammox and microalgae) for the treatment and resource recovery in municipal and industrial wastewaters, ecotoxicology and environmental risk assessment in several international universities and research institutes (Italian Institute for Environmental Protection and Research, Polytechnic of Milano, University of Foggia, LBE-INRA, Tokyo University of Agriculture and Technology, Newcastle University). Currently, she is a technologist at the Italian Space Agency, where she focuses on programs and research projects in life and health sciences, space microbiology, BLSS, and astrobiology. She is co-author of 37 scientific papers published in peer-reviewed international journals and of about 50 presentations/posters to scientific congresses.

Dr. Tarek BEN SLIMANE
SPEAKER

Tarek Ben Slimane graduated with a Ph.D. in Plasma Physics and Aerospace from the Institut Polytechnique de Paris in 2023. His research interests revolve around plasma technologies for in-situ resource utilization (ISRU) in space, machine learning, and space propulsion. He began his career at the Centre Spatial Étudiant École Polytechnique in 2019, where he led the experimental rockets program. His work involved concept development, modelling, manufacturing, and launching of experimental rockets. Concurrently, he contributed as a Principal Investigator at The Spring Institute for Forests on The Moon, overseeing the SCAMPI Experiment, which focuses on the study of aquatic ecosystems in microgravity. Since 2023, he received a fellowship to work on plasma technologies for CO2 conversion into fuel on Mars at the Instituto Superior Técnico at the University of Lisbon.

Dr. Nathalie BEREZINA

SPEAKER

Dr. Nathalie Berezina is an accomplished deep-tech executive and scientist with over 20 years of experience in biotechnology, circular economy, and industrial innovation. She is the founder and CEO of Norbite, a pioneering company developing insect-based biotechnologies to convert unrecyclable plastic waste into valuable resources. Throughout her career, Dr. Nathalie Berezina has led multidisciplinary R&D teams, secured significant public and private funding, and brought disruptive technologies from lab to market. Her work bridges biotechnology and engineering to create scalable, sustainable solutions for planetary and space applications. She holds a PhD in Chemistry and has authored over 30 scientific publications and 20 patents.

Tor BLOMQVIST

SPEAKER

Tor Blomqvist is an agronomist at the German Aerospace Center (DLR), where he researches the space food production system, particularly on how to integrate post-harvest management and how we can strategically work towards establishing an independent bioeconomy on the Moon and eventually on Mars. In addition to his research, Tor collaborates with other national space agencies and entities to create roadmaps for the space food production sector, creating standards and aiming to involve more industry and academia. Tor also works with initiatives like the NASA Deep Space Food Challenge, which uses challenges to foster innovation. Before his academic career, he worked as a chef in Paris and Stockholm, drawing on that experience and expertise, he emphasizes the central role of food in our lives, including its cultural, social, and emotional significance – which becomes an even more critical factor in the context of space.

Dr. Iulian-Zoltan BOBOESCU

KEY SPEAKER

Dr. Boboescu completed his PhD at the Politechnica University Timisoara, Romania, and the Biological Research Center Szeged, in Hungary, working on novel microbial – microalgal biohydrogen production approaches. He secured afterwards a Mitacs Accelerate fellowship at the Sherbrooke University in QC Canada. Here, he developed and scaled-up novel second and third generation biorefinery technologies together with some of the biggest North American companies active in the fields of biofuels, biocommodities and specialty chemicals. Subsequently, Dr. Boboescu joined the Chair of Bioprocess Engineering (BPE) in Wageningen University, The Netherlands, after securing a Marie Skłodowska-Curie Fellowship to develop a novel acoustic multiproduct microalgal biorefinery approach. Presently, Dr. Boboescu is leading the Biorefinery group of BPE working on novel processing technologies for microbial and microalgal biotechnology applications. In this context, Dr. Boboescu is developing novel mild electrified technologies to enhance, simplify or completely rethink current downstream processes for functional ingredients.

The content of the presentations was provided by the Key speakers and Speakers.

Giorgio BOSCHERI

SPEAKER

Giorgio Boscheri is a Space Engineer specializing in regenerative life support systems for space exploration. Since 2008, he has been employed at Thales Alenia Space in the Domain Exploration and Science Italy, where he serves as the focal point for research and development in this field. Based in Turin, Italy, he oversees ESA and ASI studies on food production facilities for space applications, contributing to the development of sustainable solutions for long-duration missions. His work focuses on designing and optimizing closed-loop life support systems, essential for astronaut health and habitability in environments such as the International Space Station (ISS), lunar bases, and future Mars missions.

Dr. Florent BOUCHON

SPEAKER

Dr. Florent Bouchon is postdoctoral researcher at the Center for Microbial Ecology and Technology at Ghent University. He obtained his PhD in Biotechnology at Université Paris Saclay (France) (20/09/2023). He continued his career as postdoctoral researcher at Ghent University (from 16/10/23) within the Micro4Biogas project. To date Florent has authored one peer-reviewed A1 publications Chemical Engineering Science. He has presented his research in several international conferences such as ISMET8 and the Melissa conference. In 2021, he has been involved leading an engineer project of Centrale Supelec involving MELiSSA C2 design. He is helping in the supervision of 3 PhD students and has supervised 1 MSc student with her internship project. He aims to understand energy interactions between microbial species and how they can be used in a sustainable circular economy. During his PhD, he investigated the impact of hydrodynamics on electroactive biofilms development for long term operation. In his current postdoc, he aims to use bioaugmentation to increase methanogenesis performances with special focus on pure culture of electroactive species and direct interspecies electron transfer.

Nouhaila BOUHADI

SPEAKER

I am a PhD candidate at the University Chouaib Doukkali in Morocco, where my research focuses on the hybrid optimization of space weather parameters using machine learning and physics-informed models. My goal is to combine computational techniques with heliophysics to enhance prediction accuracy and contribute to sustainable technological advancements. My academic background is rooted in physics, data science, and computational modeling, with expertise in applying machine learning to scientific research. I have had the privilege of participating in international conferences and schools, such as the African Astronomical Society (AfAS) 2024 Conference, the Pan-African School for Emerging Astronomers (PASEA) in Tunisia, and the IEEE NPSS EDUCOM International Summer School in Morocco. Beyond research, I have been deeply involved in science outreach programs, aiming to inspire young minds and promote the development of astronomy in Africa. In addition to my work in space weather, I am exploring sustainable technologies for life support systems, with applications both in space missions and on Earth. Through interdisciplinary research, I strive to contribute to global science while fostering innovation and collaboration within the African scientific community.

The content of the presentations was provided by the Key speakers and Speakers.

Karol BRESLER-PRZYBYŁ

SPEAKER

Karol Bresler-Przybył is a Polish National Trainee working t the European Astronaut Centre, ESA, in Cologne. Before coming to ESA, with background of electrical engineering, he worked on satellite system verification (JUICE, ARIEL, PIAST) and rocket avionics design. Since coming to ESA in 2024, he has been working and training tobecome a full system engineer for future Moon missions. One of the activities he was involved in was FLEXHab, the habitat next to the LUNA facility allowing for simulation of multi day missions with human in the loop. In that context, he has been working with experts from the space habitation community, trying to provide best training platform for the future lunar missions.

Dr. Martin CERFF

SPEAKER

Martin joined Luxembourg-based company Blue Horizon in 2020 following a postdoc at the Forschungszentrum Jülich where he studied metabolic fluxes of bacteria. He holds a PhD in Bioprocess Engineering from Karlsruhe Institute of Technology (KIT). Hi interest is at the interface between (Micro-)Biology and Technology: At Blue Horizon, he is developing solutions for Biological Life Support Systems for space exploration and terrestrial applications.

Dr. Wares CHANCHAREON

SPEAKER

Wares Chancharoen was born on November 18th, 1989, in Bangkok province, Thailand. He received the B.S. degree in mechanical engineering from King Mongkut's University of Technology Thonburi, Thailand, in 2012 and the M.S. and Ph.D. degrees in information science at Nagoya University, Japan. He is currently a lecturer at Princess Srisavangavadhana College of Medicine, Chulabhorn Royal Academy, Thailand. His research interests include space medicine, space engineering, mechanical engineering, and medical device design. In 2018, he was awarded the Emerging Space Leadership (ESL) from the International Astronautical Federation (IAF), France. In 2019, he got the recognition award from the Deep Space Food Challenge as one of the international teams around the world from phase 1, which was conducted by the National Aeronautics and Space Administration (NASA), the Canadian Space Agency (CSA) and the Methuselah Foundation.

The content of the presentations was provided by the Key speakers and Speakers.

Juan Carlos CORTÉS

KEY SPEAKER

He began his professional career in 1990, after working in the private sector in the aerospace field. He joined the National Institute of Aerospace Technology (INTA) as a flight test engineer, working on the Eurofighter Program, in the development of remotely piloted aircraft (DRONES), and at the Air Force's Armament and Experimentation Logistics Center (CLAEX).

He has served as Head of the Spanish Delegation to ESA and Vice President, Vice President of the International Relations Committee, President of the Committee for the Preparation of the 2019 Seville Space Ministerial Meeting, and as a member of the Board of Trustees of FIDAMC (Foundation for Research and Development of Composite Materials).

He is currently a delegate to the Council of the European Space Agency (ESA) and Spain's representative on the Horizontal Management Committee of the European Space Programme (EU 21-27). He is also a member of the Board of Directors of Hispasat SA.

ACADEMIC TRAINING

An Aeronautical Engineer from the Polytechnic University of Madrid (UPM), specializing in aircraft and propulsion, he holds a Master's degree in Business Administration, completed the Management Development Program at the Institute of Advanced Business Studies (IESE/PDD), and holds a diploma in the National Defense Course from the Advanced Center for National Defense Studies (CESEDEN). He also holds various diplomas in program management and innovation.

PERSONAL REVIEW

Responsible for promoting Spanish contribution and leadership in space programs since 2004, he has played a catalytic role in the development of the Spanish space sector in all areas, from exploration and science to technology and applications, both bilaterally and multilaterally. As Director of Space, Major Scientific Infrastructures, and Dual Programs at the CDTI (Spanish Institute of Technology and Communications), he has contributed to strengthening Spanish technological and industrial leadership in Major Scientific Infrastructures, promoted the development of dual technologies, and designed and launched the Aeronautical Technology Plan (PTA).

As Director of International Programs and, previously, Director of Global Innovative Markets at the CDTI, he was responsible for promoting and managing Spanish participation in the EU R&D Program, technological cooperation in Europe (EUREKA) and Latin America (IBEROEKA), and strengthening and developing the CDTI's international network.

Dr. Stefania COZZOLINO

SPEAKER

Stefania Cozzolino is a doctoral researcher affiliated with the Pool of MELiSSA PhDs (POMP3) in the Department of Agricultural Sciences at the University of Naples Federico II (UNINA). Her PhD research is part of the European Space Agency's (ESA) MELiSSA (Micro-Ecological Life Support System Alternative) program, dedicated to developing regenerative life support systems for long-duration space missions. Her fellowship is funded by the Italian Space Agency (ASI). Stefania holds a Master's degree in Forest and Environmental Sciences from UNINA, graduating with highest grade. Her current research centers on root system development in hydroponic cultivation and the innovative reuse of nitrogen-rich waste streams, such as treated human urine, as sustainable nutrient sources for plants. The core of her doctoral thesis investigates plant growth responses and root physiology under urea-based nitrogen conditions, using simulated C3 wastewater effluents.

This research addresses key challenges and explores innovative fertilization strategies, particularly focusing on the reuse of treated human urine in closed-loop hydroponic cultivation systems. Stefania actively collaborates on research conducted at the Plant Characterization Unit (PCU), a fully sealed and autonomously controlled growth chamber developed by UNINA within the MELiSSA PACMAN (PIAnt Characterization unit for closed life support system – engineering, MANufacturing & testing) project. The PCU enables high-resolution physiological analyses critical for bioregenerative life support systems. She contributed to the PACMAN2 project in collaboration with ETH Zurich and currently participates in PACMAN3, led by the Norwegian Centre for Interdisciplinary Research in Space (CIRiS), focusing on detailed crop characterization for space applications. Additionally, Stefania is involved in the BIOLUNA project, which investigates closed-loop hydroponic strategies to enable sustainable multicropping systems for lunar agriculture.

Eva CREAUS OLEART

SPEAKER

Eva Creus is a Chemical Engineer from the University of Barcelona with more than 25 years of experience as quality expert dealing with projects in the most regulated businesses such us space, defence, IVDR medical devices (PRRC), nuclear or automotive. She started her professional life in 1998 working as quality and environment responsible in a wood processing company from where she moved to the automotive business working there for 6 years. After this professional experience, she moved to the space business working in SENER Ingeniería y Sistemas Space Division and taking the role of PA Manager for well recognized and demanding projects such us PAZ, SEOSAR, SEOSAT, Solar Orbiter or Proba3 and assuming also the responsibility for Crew Safety in Microgravity projects as MARES, MELISSA, EMG System or FixBox. She moved to Fusion for Energy (F4E - European Comission) as Head of Quality Assurance to come back to SENER Aeroespacial and Defence where currently plays the role of Quality and Regulatory Director. She owns a Post Degree in Critical Software Product Assurance and the certification as IRCA Auditor for ISO 9000:2000 series, Six Sigma Black Belt and PMP. She has published the following papers:

- Catalysis Today - Comparative study of IPTBE synthesis on HZSM-5 and ion-exchange resins catalysts J. Tejero; E. Creus; M. Iborra; F. Cunill; J.F. Izquierdo; C. Fité
- Science Direct - Practical implementation within the electron cyclotron upper launcher of the French INB order of 2012 P. Wouters; M. Gagliardi; G. Saibene; V. Gracia; B. Mille; I. Benilan; E. Creus; S. La Rovere; N. Di Leva; B. Baldisserri; C. Vercilli; S. Castrillon
- Microgravity Science and Technology – The FixBox: New hardware to provide onorbit fixation capabilities to the EMCS on the ISS A. Manzano, E. Creus, A. Tomàs. MA. Balbuena, A. Villacampa, M. Ciska, R.E. Edelmann, J.Z. Kiss, FJ Medina, R. Hernanz

And has received the following honours and awards:

- EUROPEAN SPACE AGENCY (ESA) Team Achievement Award For FOTON M3 Mission Support. September 2007
- EUROPEAN SPACE AGENCY (ESA) Team Achievement Award For safety and quality responsability in MARES project. 2009

Prof. Veronica DE MICCO

SPEAKER

Veronica De Micco is Full Professor of Environmental and Applied Botany at the University of Naples Federico II (UNINA), previously Associate professor (2015-2021) and Assistant Professor (2007-2015), where she is Responsible of the Plant & Wood Traits Lab. She graduated at UNINA with laudem in Agricultural Sciences (2000) and achieved the title of PhD in Woody Coltures (2004) with a period of research training at the Washington State Univ. (USA). Until 2015, main research activity conducted at UNINA, University of Rome La Sapienza, University of Salerno and CNRS - CERMAV (Grenoble, FR). Listed among the World's Top 2% Scientists by Stanford University, her studies regard the links between plant structure/function and environmental/crop factors with particular attention to the analysis of hydraulic and photosynthetic efficiency. Such kind of studies are applied to the productivity and sustainability of natural and agricultural ecosystems on Earth in a context of climate change and in artificial ecosystems in extreme environments. In Space-related research, she combines studies of fundamental plant biology with applied studies targeted to the definition of requirements for crop production, with a focus on the plants' responses to ionizing radiation. She has participated to more than 30 and coordinated 14 national/international projects. Currently, she is Coordinator of PRIMO project "Priming Radiation-Induced plants' adaptation to Moon: make an enemy your friend" selected by ESA within the AO-2022-Reserve Pool of Science Activities for the Moon. Main appointments in space-related field: Vice-Chair of the Life Sciences Working Group (LSWG) of ESA (2000-2004); Member of the Facility Science Teams (FST) of ESA for ISS Biolab; Member of the Lunar BioMission Topical Team of European Space Agency (ESA); Coordinator of the International Working Group for the realization of the ESA Roadmap #9 (Biology in Space and Analogue Environments, Plant Biology) and ROADMAP #11 (Bio-regenerative life support systems in space: space biotechnology & space agriculture within program) within ESA SciSpacE white papers. She has been teaching at UNINA since 2007, being also the tutor of 6 PhD students and more than 50 Laurea/Master students. BIBLIOMETRICAL INDICATORS (Scopus May 2025): Documents n. 153; Citations n. 4336; h-index: 36.

The content of the presentations was provided by the Key speakers and Speakers.

Dr. Marta DEL BIANCO

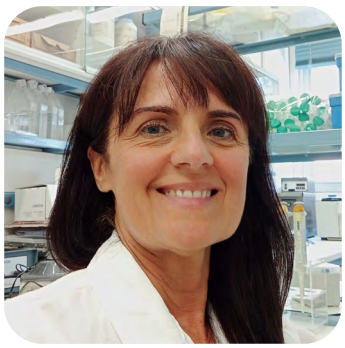
KEY SPEAKER

Marta Del Bianco is researcher at the Italian Space Agency (ASI), where she conducts basic research in the field of plant response to gravity, bio-regenerative life support systems, and food production. Member of the Organizing Committee of the Space Life Sciences Working Groups of ASI, where she is the coordinator of the Working Group on Biological Systems for Life Support, and ASI representative at ISLSWG (International Space Life Sciences Working Group).

Frederik DESCHUYTTER

SPEAKER

Pleun van Dijk (NL/NO) and Frederik Deschuytter (BE) are speculative designers who occasionally collaborate on themes of shared interest. Moving beyond prediction, speculative design is an artistic research method for exploring possible futures through a design lens. By making the implications of emerging technologies and societal shifts tangible, it sparks public dialogue and fosters critical reflection on the consequences of our choices. By showing us the possible, impossible, utopian, and dystopian outcomes of our decisions today, it invites us to consider the full spectrum of what might lie ahead. Increasingly seen as a tool to get a grip on the complex problems, speculative design bridges specialized scientific and academic knowledge with broader public understanding to help shape the futures we desire. By translating abstract or siloed research into immersive scenarios, speculative design opens up space for people from all backgrounds to engage in critical discussions about technology, ethics, and society. While Frederik's work focuses on complex technological systems, Pleun's practice investigates human evolution at its intersection with technology. Together, they aim to craft immersive experiences that challenge assumptions about who we are and who we want to be. www.pleunvandijk.comLinkedIn: Pleun van Dijk IG | @p_l_e_u_n www.frederikdeschuytter.com LinkedIn: Frederik Deschuytter Instagram | @frederikdeschuytter



Dr. Angiola DESIDERIO

SPEAKER

Researcher at ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development – Department of Sustainability Institution
Address: Via Anguillarese, 301 – 00123 Rome, Italy Brief CV:

- 1989: Master's Degree in Biological Sciences, Sapienza University of Rome.
- 1993: PhD in Evolutionary Biology, Sapienza University of Rome.
- 2001: Researcher at the Biotechnology Laboratory, ENEA.
- 2021: Appointment as Head of the ENEA Task Force "Agrospace and bioregenerative life support systems"

RESEARCH ACTIVITIES:

- Investigation of genes involved in pathogen resistance in genetically engineered plants.
- Expression of recombinant antibodies in plants for combating plant viruses.
- Development, analysis, and patenting of a phage display library of recombinant antibodies.
- Establishment of a differential proteomics facility for projects on fruit ripening physiology, stress response, transgenic plant equivalence, and cervical cancer analysis.
- Molecular studies on mosquito reproductive control.
- Characterization of bioactive molecules from plants cultivated in controlled environments for biopharmaceutical and space applications.
- Bioregenerative systems for organic resource recovery in space missions.

PUBLICATIONS AND PATENTS:

- Author of over 30 peer-reviewed publications.

Inventor in three scientific patents.

Marion DUGUÉ

SPEAKER

Marion Dugué has started researching the valorisation of menstrual blood in a spaceflight context in 2021, with a keen interest in using it for regenerative medicine (stem cell therapy) aboard spacecrafts. Since 2022, she has been working with SpaceshipFR in prototyping the menstrual fluid collection device and furthering the AMMITY project. She has been involved in analogue missions both on the coordination side (CHILL-ICE) and as a team member (Asclepios) from which she learnt more about feminine hygiene in remote, resource-limited and lack of personal space environments. The main objective of Marion's research on this topic is to open up the discussion on menstrual management in space and explore the many ways this used-to-be "taboo" topic can be used a a resource, in space and Earth alike. On this side of this project, she is currently pursuing a PhD in Earth Observation at ETH Zürich, Switzerland.

Bérénice DUPONT

SPEAKER

Bérénice Dupont is a microbiologist in the final year of her PhD at ESPCI Paris. Her research focuses on optimizing cyanobacterial cultivation to recycle carbon dioxide into oxygen. She advances bioreactor technology by integrating acoustic levitation, working at the interface of physics and biology.

The content of the presentations was provided by the Key speakers and Speakers.

Gabriele ELLENA

SPEAKER

Gabriele Ellena is a researcher with interests in biology, space exploration, and extreme environments. He has a master's degree in Biology of Extreme Environments with a specialization in Astrobiology, from the University Federico II of Naples, Italy. His master's thesis, presented at this conference, focuses on the development and implementation of a simulated microgravity setup for cultivating edible cyanobacteria as part of the MELiSSA Project during an internship at SCK CEN, Belgium. He is currently pursuing a Ph.D. in Bioscience Engineering at the University of Antwerp, funded by the FWO, and conducted at SCK CEN. His research investigates the "Selection and cultivation of Microbe-Based Food Supplements in extraterrestrial environments to support human life on Mars." Gabriele also holds a degree from the University of Turin, Italy, where his thesis focused on human physiology in space conditions. His academic background includes participation in training programs such as the European Astrobiology Academy from the CAB, the ESA/ELGRA Gravity-Related Research Summer School 2023, and the ESA-FAIR Radiation Summer School 2024.

Filiz EMIRLI

SPEAKER

Filiz Emirli is pursuing a double master's degree in Biotechnology and Entrepreneurship at the Norwegian University of Science and Technology (NTNU), with a specialization in space entrepreneurship and biotechnology. She is affiliated with Spectrum Blue, a Norwegian deep-tech company focused on developing advanced antimicrobial coatings. Emirli has been instrumental in advancing and communicating the science behind Q-FIELD, a photocatalytic pigment engineered to provide continuous antimicrobial protection. Her experience also includes a key role in the student organization Orbit, where she served as the primary scientist for the development of a life support system (LSS) for BioSat, a satellite-based plant growth project. Emirli is certified in astrobiology through AbGradE and the European Astrobiology Institute (EAI), and actively contributes as a volunteer with both Astrobiology Graduates in Europe (AbGradE) and Mars On Earth Project (MOEP) . Through her research and outreach, Emirli is dedicated to pioneering innovative solutions for infection control and sustainable life support systems in space.

Michel FRANKE FABIEN

SPEAKER

Michel Fabien Franke is a systems engineer with experience in the automotive and space sector. By completing Volkswagen's integrated degree program in 2017, he obtained a B.Eng. in Automotive Engineering and was certified as a Construction Mechanic, specializing in sheet metal engineering. After having worked at Volkswagen's R&D division from 2017 to 2019, he decided to return to campus to pursue a M.Sc. in Space Engineering at the University of Bremen. In 2022, he completed a six-month internship at Space Application Services in Brussels, where he worked as a space systems engineer and contributed to a lunar rover project. From 2021 to 2022, he worked at the German Aerospace Center (DLR) as a student associate within the Synergetic Material Utilization (SMU) research group, developing an ISRU testbed for the beneficiation of lunar regolith. Upon obtaining his degree, Michel volunteered for Engineers Without Borders (project manager for water-related aspects of a school project in Uganda), successfully completed the International Space University's Space Studies Program (SSP) in Portugal and returned to Volkswagen (developing a concept for Volkswagen's all-electric budget car). Now, he is a full-time systems engineer at DLR, developing planetary infrastructures for Moon and Mars. Currently, he is focusing on bio-regenerative life support systems developed for the EDEN ISS, EDEN LUNA and LAM-GTD projects.

Queralt FARRÀS

SPEAKER

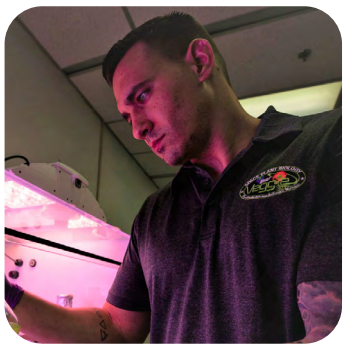
Queralt Farràs Costa is a biotechnologist (UAB, 2016) with a specialization in Biochemical Engineering through her MSc in Life Science & Technology (TU Delft, 2019). During her bachelor's studies, she completed a research stay at the Max Planck Institute of Psychiatry in Munich, where she worked in the Molecular Psychotraumatology Group on the epigenetic analysis of post-traumatic stress disorder. Later, she joined the Cell Engineering Group at the Department of Chemical, Biological and Environmental Engineering (UAB), contributing to the development of a scale-up strategy for the production of Gag-GFP HIV-1 VLPs. Her MSc thesis focused on the implementation of a perfusion system for red blood cell production. After completing her master's degree, she became Area Leader of the VEProcess Department at VEnvirotech, where she supervised R&D projects in the selection and accumulation of PHA-producing bacteria, at both laboratory (up to 5 L) and pilot (up to 23 m^3) scales. She later joined Eurecat as an Advanced Researcher in the Water, Air and Soil Unit, coordinating projects related to wastewater treatment and recycling. She is currently working as a Bioprocess Engineer at the MELiSSA Pilot Plant at UAB.

Thomas FILI

SPEAKER

Thomas Fili is an Advanced Life Support system engineer, with key expertise in Bioregenerative Life Support Systems and ECLSS Simulation. He is involved in MELiSSA related studies since the beginning of his carreer.

The content of the presentations was provided by the Key speakers and Speakers.



Jason FISCHER
SPEAKER

Jason is a research and development scientist at NASA's Kennedy Space Center primarily investigating bioregenerative purification technologies focusing on wastewater purification for early planetary habitats on newly colonized celestial bodies. He has also supported ECLSS tasks related to advanced plant studies, logistical trash reduction, and other ISRU projects.

Louise FLEISCHER
SPEAKER

Louise Fleischer has a master in Aeronautics and Astronautics from Stanford University and a master in Astrophysics from Ecole Polytechnique. She worked as a Systems Engineer at the Zipline, a california-based start-up delivering medical products with drones. Since 2022, Louise is the President of The Spring Institute for Forests on the Moon, a research organization focused on life-support systems for long-term space exploration. Her contagious passion for space has led Louise to lead several conferences and workshops for the general public and she teaches in topengineering schools ESTACA and Centrale-Supélec. She recently started a PhD funded by the French space agency Centre National d'études Spatiales and Université Clermont Auvergne on the topic "From Leaf to Canopy: Scaling up Plant Growth Models in Space".

Prof. Emmanuel FROSSARD
SPEAKER

Emmanuel Frossard has been Full Professor of Plant Nutrition at the Institute of Agricultural Sciences at the ETH Zurich since 2000. After completing his doctorate at the Institut National Polytechnique Lorraine in Nancy, France, he spent two years as a postdoc fellow in the Department of Soil Science at the University of Saskatchewan, Canada. From 1985 to 1994 he was a lecturer in the Group for Crop Production at the INPL before becoming Associate Professor of Plant Nutrition at the ETH Zurich in 1994 and full Professor in 2000. He has been from January to June 2013 a visiting scientist in the group "BioGeoChemistry" of Prof. PM Vitousek, Stanford University, USA and from February to July 2020 a visiting scientist in the group "recycling and risk" of CIRAD on La Réunion Island. Prof Frossard has been president of the steering committee of the Swiss National Research Program on soil (NRP 68) from 2014 to 2018 and he is currently director of studies of the agricultural sciences program at ETH Zurich.

The content of the presentations was provided by the Key speakers and Speakers.

Prof. Sigfredo FUENTES

SPEAKER

Dr. Sigfredo Fuentes is an Associate Professor in Digital Agriculture, Food, and Wine Sciences at the School of Agriculture, Food, and Ecosystem Sciences, Faculty of Science, The University of Melbourne. As a Chief Investigator at the ARC Centre of Excellence in Plants for Space, he focuses on innovative research combining agricultural science and space technology. In addition to his role Dr. Fuentes serves as a Distinguished Visiting Professor at both Tecnologico de Monterrey in Mexico and The University of Talca in Chile, fostering international collaboration and advancing the field of digital agriculture and Food Sciences.

Dr. Iwona GAJDA

SPEAKER

Iwona is a Senior Lecturer at the Engineering School in the College of Arts, Technology and Environment at the University of the West of England (UWE) in Bristol, UK. Holding an M.Sc. in Biology and a PhD in Environmental Engineering, most of her research is affiliated with the Bristol Robotics Laboratory (BRL). Iwona's work includes resource recovery from waste streams and technology implementation in real-world environments. With a diverse background spanning biology, electrochemistry, and engineering, the primary focus of her work is on multidisciplinarity and innovation across the Technology Readiness Level (TRL) spectrum, from idea to implementation. Ranked among the 2% top-cited scientists in the world in the Stanford/Elsevier list in 2022-23. Iwona was lead researcher in Urinetricity Project, funded by the Bill and Melinda Gates Foundation, which focused on off-grid, self-sustainable sanitation systems. Iwona's interests include innovation in converting waste into energy in real implementation environments, including environmental and sustainable robotics, as well as the recovery of water and nutrients from wastewater, electrosynthesis, and sensing. She is particularly interested in integrating multidisciplinarity and bioinspiration represented by Bioelectrochemical Systems to tackle today's global challenges.

The content of the presentations was provided by the Key speakers and Speakers.

Sara GARCIA ALONSO

KEY SPEAKER

In November 2022, Sara Garcia Alonso was selected as a member of the ESA Astronaut Reserve, becoming the first Spanish woman to achieve this milestone. Sara received her bachelor's degree in biotechnology in 2012 and a master's degree in biomedical and biological research in 2013, both from the University of León in Spain. She was awarded two different prizes for her academic excellence. In 2018, she obtained a cum laude PhD in Molecular Biology of cancer and translational medicine from the University of Salamanca (Spain), being awarded the University's Outstanding Doctorate Award for the best doctoral thesis in medicine. During her PhD, Sara worked as a research assistant for the Spanish National Research Council (CSIC), focusing on personalized cancer medicine. Since 2019, she has been working as a research scientist at the Spanish National Cancer Research Centre (CNIO), leading pioneering projects to discover new treatments for lung and pancreatic cancer. In 2021, she completed a 6-month executive programme on science and technology entrepreneurship at the IE Business school.

Sara is a passionate science communicator, with numerous conferences and events aimed at motivating young people to pursue STEM careers, and she actively promotes the benefits of science and the space sector. She has received numerous awards, including the Ada Byron Young Award 2023, the Silver Medal of the Community of Madrid, and the title of Distinguished Daughter of León, as well as being listed among the top 35 female technology leaders in Spain and the top 100 most influential women in Spain, according to Forbes magazine.

Vincent GARREAU

SPEAKER

Alexandre Boehler, Paul Collette, Alexandre François, Vincent Garreau and Elisa Lemoine are 5 students from the ESTACA engineering school based near Paris in France, with all five specialize in space transport technologies. This work was carried out as part of a yearly project organized between the school and professional actors, in this case The Spring Institute for Forests on the Moon whose goal is to provide passive biological life support for future astronauts.

Dr. Marco GATTI

SPEAKER

Results-driven Project Engineer with a Ph.D. in Energy Engineering and 5+ years of experience leading multidisciplinary projects across the aerospace and energy sectors. Skilled in coordinating cross-functional teams, developing simulation models, managing experimental test benches, and delivering client-focused solutions. Proven ability to drive complex projects from concept through validation, ensuring technical excellence and alignment with stakeholder requirements. Fluent in English and French, with international experience across Europe. He works at EnginSoft since 2020 as a Project Engineer. He has been involved in several activities related to the ESA research program MELiSSA (OSCAR, PaCMan, VARSITY).

Guillaume GÉGO

SPEAKER

Guillaume Gégo is a researcher and student specializing in Environmental Control and Life Support Systems (ECLSS), with a focus on space biology and the development of Earth biotechnological systems for sustainable waste treatment and food production. He earned a Bachelor's degree in Biology in 2022 and a Master's degree in Biochemistry, Molecular, and Cellular Biology in 2024 from the University of Mons (UMONS), Belgium. During his first master's program, he completed a six-month internship at the MELiSSA Pilot Plant (UAB, Spain), where he conducted research on bacterial urine hydrolysis and nitrification for closed-loop life support systems in space missions. In 2024, Guillaume participated in the 8th ESA/ELGRA Gravity-Related Research Summer School at ESEC Galaxia, Belgium, where he developed a master's thesis on designing low-cost photobioreactors for cultivating Rhodospirillum rubrum. This project, part of a UMONS initiative, won first place in the ESA Technology Transfer Competition and received the Adrien Bauchau BBMC thesis award. The photobioreactors he designed were tested in analog space missions at the Analog Astronaut Training Center (AATC) in Poland and the Mars Desert Research Station (MDRS) in the US. That same summer, he completed a 10-week internship at SHERPA Engineering in Nanterre, France, where he developed a model of MELiSSA's nitrifying compartment (C3) using MATLAB Simulink. He also co-authored a review article on autonomous food production for space exploration, which is currently under review in Frontiers in Bioengineering. Since September 2024, Guillaume has been pursuing an Advanced Master in Space Studies at KU Leuven, Belgium, with the support of a full ESA Academy Scholarship. His ongoing master's thesis at the Laboratory of Applied Space Microbiology (LASM) in Bremen, Germany, focuses on designing photobioreactors for cyanobacteria cultivation using Mars in-situ resource utilization strategies. Additionally, he co-founded GODFEATHERS, a project awarded in the 2024 CASSINI Hackathon (Belgium level), which focuses on using drones for high-resolution mapping in disaster response scenarios. Through all of these endeavours, Guillaume aims to become a significant contributor to the field of space biology within the European Space Sector.

Dr. Luigi GENNARO IZZO

SPEAKER

Luigi Gennaro Izzo is an Assistant Professor of Environmental and Applied Botany at the Department of Agricultural Sciences, University of Naples Federico II (UNINA). He earned his Master's degree in Biological Sciences in 2015 and his PhD in Agricultural and Food Sciences in 2019, during which he conducted research on plant lighting within the MELiSSA Project, focused on enhancing plant-based bioregenerative life-support systems. He has contributed to several projects funded by the Italian Space Agency (ASI) and the European Space Agency (ESA), undertaking research at international institutions including NASA Kennedy Space Center (USA), the ESA European Space Research and Technology Centre (The Netherlands), the Department of Environmental Horticulture at the University of Florida (USA), and the Institute of Plant Physiology and Genetics at the Bulgarian Academy of Sciences. He has been a member of the Low Earth Orbit (LEO) Plant Biology Facility Definition Team as ESA Consultant for review of ISS capabilities, to define scientific priorities for space exploration and establish research requirements for the development of the Plant Biology Facility on the International Space Station. He also serves as reviewer for the NASA Postdoctoral Program (NPP) projects. His current research primarily addresses plant responses to light quality, plant tropisms, and plant reproduction under altered gravity conditions.

The content of the presentations was provided by the Key speakers and Speakers.

Icíar GIMÉNEZ DE AZCÁRATE BORDÓNS

SPEAKER

Icíar completed a Bachelor's and a Master's degree in Agricultural Engineering and Sciences at the Polytechnic University of Madrid. Working first as a technician and consultant in an agriculture cooperative, and later as R&D engineer in a company specialized in fertilizers and hydroponic systems, she gained practical experience in agricultural practices and technologies. In 2021, Icíar joined the Plant Nutrition group at ETH Zurich as a Research Assistant in the PACMAN2 project (PlAnt Characterization unit for closed life support system - engineering, MANufacturing & testing phase 2), funded by the European Space Agency. Based on this experience, Icíar started a PhD within the same group, also funded by the European Space Agency through the POMP3 grant. The focus of her thesis is on investigating the use of organic waste as an efficient source of nutrients for plant growth in hydroponic systems and in closed environments. Her research contributes to improving knowledge on circular nutrient use, developing innovative solutions for sustainable crop production for both terrestrial and space applications.

Prof. Dorothée GOFFIN

SPEAKER

Pr Dorothée Goffin is a bioengineer in chemistry and bioindustry and holds a PhD in Agricultural Sciences and Biological Engineering from the University of Liège, faculty of Gembloux Agro-Bio Tech. She is the Co-founder and Director of the Smart Gastronomy Lab, and the principal investigator of the Laboratoire en Sciences Gastronomiques (LSG) and Study director of the "Master en Innovation et Conception des aliments". The SGL, an accredited member of the Wallonie Entreprendre network, has supported more than 300 project leaders and companies in the development of food products since 2016. The LSG develops applied research in the emerging field of culinary sciences in line with new consumer needs. These allow the study of food processes such as ingredient assembly, cooking and fermentation through a physicochemical approach and through the use of disruptive technologies (sensors, spectroscopy, image analysis, AI, IoT, etc.) to develop processes that are more respectful of food and energy-efficient and to design healthy, sustainable, personalized products with optimized organoleptic properties. Development of processes and food products in extreme environment such as space are also studied. LSG is also developing new methodologies for monitoring eating behavior through the development of connected tools such as Smart trays and Smart glasses.

Dr. Alejandro GOMEZ-SAN-JUAN

SPEAKER

Alejandro Gomez-San-Juan earned a degree in Aeronautical Engineering from Universidad Politécnica de Madrid in 2010, followed by an M.Sc. in Aerospace Engineering (2013) and a Ph.D. in 2018, with a dissertation on uncertainty calculation in spacecraft thermal control. From 2011 to 2021 he conducted research at the Instituto de Microgravedad Ignacio Da Riva (IDR/UPM), contributing structural and thermo-elastic analyses to ESA missions such as Solar Orbiter (PHI, EPD), ExoMars 2018 (NOMAD), Chang'E 4 LND, UPMSat-2, Sunrise 3, Lagrange MEPS, SMILE SXI, and ARIEL. In the last years his research profile has become quite interdisciplinar. In April 2021 he joined the Universidad de Vigo's School of Aerospace Engineering, working on WipTherm, an H2020 FET-Open Cubesat wireless energytransfer demonstrator. Since 2022 he has served as thermal-structural engineer on ESA's Antennas for Underground Communications project, and as PI on an Instituto Astrofísico de Canarias contract for the VINIS Earth-observation telescope. He is a member of ESA's European Working Group for Thermo-Elastic Verification and, in 2023, was awarded ESA and national grants to develop STOP structural-optical interface research and uncertainty-propagation methods in thermo-elastic analysis. On top of that, Alejandro has been analogue astronaut, accumulating more than 400 hours living in caves in simulated lunar environments.

Dr. Claudia GONZALEZ VIEJO

SPEAKER

Claudia Gonzalez Viejo is a Research Fellow at The University of Melbourne, where she develops innovative digital technologies using artificial intelligence to improve astronauts' wellbeing and sensory experiences in simulated space environments. Her research plays a crucial role in developing more palatable and nutritious food and beverages to combat menu fatigue and improve astronauts' nutrition during long-term space missions. Claudia's expertise extends into the realm of agricultural, food, and beverage sciences and engineering with a strong focus on integrating robotics, sensors, computer vision, biometrics, and machine learning. Her interdisciplinary approach not only advances space exploration but also delivers impactful solutions for improving food systems on Earth.

Patrick GROVE

SPEAKER

Patrick Grove is an American space scientist with an emphasis on using ecosystem services for life support applications. He is a co-founder of the French non-profit research organization "The Spring Institute for Forests on the Moon", where he leads many of the technical R&D projects as the CSO. Patrick has a Master's degree from the University of Arizona where he studied controlled environments such as Biosphere 2.

The content of the presentations was provided by the Key speakers and Speakers.

Andreas GUÐMUNDSSON GÄHWILLER

SPEAKER

Andreas Guðmundsson Gähwiller completed his masters studies in Biology at the University of Iceland in the spring of 2025. He got involved with space research through the 2024 ESA Academy Experiments Programme as a part of the SelenarFungi project, the aim of which was to assess the viability of using mycorrhizal fungi to aid the growth of plants in a simulated lunar environment. This involved growing lettuce on a Large-Diameter Centrifuge to expose the plants to hypergravity, but also the use of a Random Positioning Machine to simulate lunar gravity.

Patricia GUTIÉRREZ LOZANO

SPEAKER

Colombian predoctoral researcher in the group Bio-based Sustainability Engineering (SUSTAIN) from the University of Antwerp, Belgium. Master in Water Sustainability (UAntwerpen, BE) and Environmental Engineer (Uniandes, COL). Experienced on nitrogen recovery from waste streams and engineered systems for sustainable water management.

Iris HALLEGOUET

SPEAKER

Iris Hallegouet is a first-year Ph.D. student in the MIMM Team of the CEISAM laboratory of Nantes Université in France. Her supervisors are Jonathan Farjon as a CNRS Research Director, at the CEISAM laboratory (UMR CNRS 6230) and Olivier Gonçalves, Professor at the GEPEA laboratory (UMR CNRS 6144). Her Ph.D. is funded by the European Spacial Agency and by région Pays de la Loire. Her subject is : "Towards the development of a spatial survival system : The contribution of flow NMR to on-line monitoring of the biochemical composition of microalgae grown in photobioreactors". She obtained three French university degrees : a master's degree in analytical chemistry at Université Paris-Saclay, a bachelor degree in chemistry obtained at Aix-Marseille Université, and a two-year technical degree in synthesis and analytical chemistry obtained at Université de Rennes. During her studies, Iris carried out three internships stays. In 2024, she did a six-month internship in the R&D department of the authenticity business unit of Eurofins Analytics France. The subject on Site-specific Natural Isotopic Fractionation Nuclear Magnetic Resonance or SNIF NMR. She was supervised by Dr Freddy Thomas, Head of the R&D department. In 2023, she completed a three-month internship in the LRMN team of the ICMMO laboratory of Université Paris-Saclay. She was involved in structural analysis of chiral molecules by 2D anisotropic NMR of deuterium in natural abundance, supervised by Dr Philippe Lesot, CNRS Research Director. In 2021, she did a two-month internship on ether lipid synthesis for selective modulation of membrane proteins involved in cancers in the COSM team of the CEMCA laboratory of Université Bretagne Occidentale, where she was supervised by Pr Hélène Couthon.

Siert HAMERS

SPEAKER

Siert Hamers is a master's student in Space Engineering at Delft University of Technology (TU Delft), with a background in Mechanical Engineering and a deep personal interest in plant biology and sustainable life support systems.
His academic journey reflects a growing commitment to the intersection of engineering and bioregenerative systems for space applications. Siert is currently working on his MSc thesis, which focuses on the development and experimental validation of a fogponic nutrient delivery system designed for use in lunar greenhouse environments. His research explores how ultrasonic misting can be used to improve water and nutrient efficiency in closed-loop agricultural systems, contributing to both space exploration and sustainable food production on Earth. His previous experience includes an internship at the German Aerospace Center (DLR), where he contributed to the EDEN LUNA project, as well as academic projects on plant development under simulated Martian radiation and the detection of plant stress using ultrasonic sensing.
Motivated by the ambition to contribute to future life support systems in space, Siert aims to combine engineering rigour with biological insight to help advance sustainable solutions both on Earth and beyond.

Dr. Martin HARTMANN

KEY SPEAKER

Martin Hartmann is a Senior Scientist at ETH Zurich and a distinguished researcher specialized in microbial ecology and sustainable agriculture. His research centers around the pivotal role of soil microbiomes for the functioning of agroecosystems and the impact of global change factors on this vital resource. His primary interest lies in leveraging microbial functions to enhance soil health, promote sustainable crop production, and improve circularity of agricultural systems. As lecturer and mentor, he is passionate about educating and inspiring the next generation of scientists. Dr. Hartmann is the Editor-in-Chief of the European Journal of Soil Biology and a member of the International Society for Microbial Ecology.

Dr. Berat HAZNEDAROGLU

KEY SPEAKER

Berat Z. Haznedaroglu is an assistant professor at The Institute of Environmental Sciences at Boğaziçi University in İstanbul. Berat's research group focuses on understanding the fundamental biochemistry of algal species by coupling with high-throughput systems biology tools including next-generation DNA sequencing, metabolomics, proteomics, and bioinformatics. His group develops algae biotechnology for nutritional supplements, biofuels, value-added chemicals, carbon-capture and wastewater treatment applications. Berat has inaugurated the first carbon-negative biorefinery of Europe to develop algae-based bioproducts for Food:Energy:Water nexus co-funded by the European Commission and Turkish Ministry of Industry and Technology. Very recently, he has been awarded with Newton Advanced Fellowship from Royal Society of UK and TTGV Fellowship from Technology Development Foundation of Türkiye.

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Dr. Raul HERRANZ

SPEAKER

Raúl Herranz, PhD SOSmicrogravity Lab I3 researcher Centro de Investigaciones Biológicas Margarita Salas (CSIC, Madrid SPAIN) Awarded with a PhD in Biochemistry (molecular evolution, UAM, Spain/ Supervisor Prof. Marco, 2004) including his first spaceflight experiments as PhD student (Drosophila GENE/AGEING experiments in the Spanish Soyuz Cervantes Mission, 2003), Raul Herranz worked as posDoc in several EU ground simulation labs, mainly at the European Space Agency (ESTEC, The Netherlands/ Supervisor Dr. van Loon, 2008) on LDC biological validation. Then, he joined the PCNPµG lab in Spain (CSIC, Spain/ Supervisor Dr. Medina) as transcriptomics expert, focused on the overall transcriptional effects of suboptimal spaceflight environments. He was the coordinator of several ESA and United Nations ground simulation projects, Co-I in the ESA/NASA largest Arabidopsis plant biology experiment at ISS (SEEDLING GROWTH) and invited as expert for United Nations, ESA LifeSciences and NASA (GENELAB) working groups. Today, he is leading the PID2023 SOSmicrogravity project, and is the European coordinator of the ESA funded Space Omics Topical Team and International Standards for Space Omics Processing (ISSOP, https://issop.space/spaceomics- topical-team/).

Katharina HILDEBRANDT

SPEAKER

Katharina Hildebrandt is an engineer currently working at the Microgravity User Support Center (MUSC) in Cologne, Germany, where she is involved in the operation and maintenance of various ISS payloads, including Biolab, EDR, EML, and LCI. In her role, Katharina supports the day-to-day operations of these payloads, conducts ground tests and repair tasks on ground models of the payloads. She is also responsible for developing operational procedures and documentation, ensuring the smooth execution of scientific experiments on the ISS. Before joining MUSC, Katharina worked as a Young Graduate Trainee in the Advanced Concepts Team at the European Space Agency (ESA) in Noordwijk. Katharina holds a Master's degree in Production Engineering, specializing in Engineering for Flight and Space Flight, from the University of Bremen, and a Bachelor's degree in Biomimetics from the University of Applied Sciences Bremen, including a semester abroad at the New Jersey Institute of Technology.

Hadi JBARA
SPEAKER

Hadi Jbara is a PhD fellow at INRAE's Micalis Institute, where his research focuses on the genetic mechanisms underlying bacterial biofilm adaptation to extreme conditions, including simulated microgravity and hypergravity, in collaboration with the European Space Agency (ESA). His work integrates cutting-edge tools such as CRISPRinterference screens, next-generation sequencing, and confocal microscopy to investigate biofilm formation and microbial behavior in space environments. With a Master's degree in Systems and Synthetic Biology from Université Paris-Saclay, Hadi has a strong foundation in molecular biology, biofilm phenotyping, and bacterial transformation. He also leverages advanced imaging software like BiofilmQ and Imaris, alongside Python-based data analysis. Beyond his research, Hadi has contributed to the synthetic biology community as a multi-year judge for the iGEM competition. His work not only enhances our understanding of microbial systems in extreme environments but also provides valuable insights for biotechnology and space exploration.

Anja JENNER
SPEAKER

Anja Jenner holds a MSc in Aerospace Technology from the University of Stuttgart in Germany. She joined the Centre for Interdisciplinary Research in Space (CIRiS) in autumn 2024 as a research assistant. Her work focuses on plant production in closed-loop life support systems, with applications in both spaceflight missions and sustainable agriculture on Earth. Of special interest are plant growth and development in hydroponic systems, with a particular focus on the role of calcium as a pH regulator. Furthermore, she contributes to ESA's Plant Characterization Unit at the Laboratory of Crop Research in Space (PaCMan project), focusing on seedling development. Additionally, she is responsible for the experimental implementation of a substrate-less root module designed for hydroponic crop cultivation under fractional gravity conditions (SULEROMO project).

Prof. Lyudmila KABAIVANOVA
SPEAKER

Lyudmila Kabaivanova graduated from Sofia University "St. Kliment Ohridski", Faculty of Biology, with M.Sc. Degree in Biochemistry and Microbiology. She received her PhD Degree in Microbiology at The "Stephan Angeloff" Institute of Microbiology, Bulgarian Academy of Sciences. Currently, she is a Professor, Deputy Director in the same institute and Head of Department "Biotechnology". Her scientific interests are in the field of microbiology and biotechnology, green energy production for sustainable development. She is an author of more than 130 publications in the field.

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Nele KIRKERUP

SPEAKER

Nele Kirkerup is member of the Pool of MELiSSA PhDs (POMP) III program and investigates the fate of organic compounds during biological treatment of urine. She has always been interested in space technologies, wanting to study aerospace engineering before joining the environmental engineering department at ETH Zurich. During the master program her interest in circularity and the versatile application and definition of sustainability grew. She wrote her bachelor thesis on particle pollution around airports and her master thesis on urine nitrification in biofilm systems, which fostered her interest in lab work, resource recovery and circularity. During her studies, Nele actively engaged in different student associations, building soft skills such as team management and communication, which she is now implementing in her scientific research. By entering the POMP III program Nele combined her interests acquired during the years at ETH with her childhood dream of working in space technologies.

Dr. Ann-Iren KITTANG JOST

SPEAKER

Dr. Ann-Iren Kittang Jost holds a Ph.D. in Biology from the Norwegian University of Science and Technology (NTNU), Norway. As the Head of CIRiS and Research Director at the Centre for Interdisciplinary Research in Space (NTNU Samfunnsforskning AS), Dr. Jost has coordinated projects in space biology and life support systems, such as LunarPlant, focusing on hydroponic plant cultivation on lunar bases using nutrient sources from human waste, and the TIME SCALE project, which developed modular equipment for advanced life support systems in space. She has also managed projects with the European Space Agency and has several years of experience in the integration and operation of payloads for higher plant experiments. Dr. Jost is a member of several committees, including the European Space Sciences Committee/Life and Physical Sciences Panel and the International Space Exploration Coordination Group/Life Support System Gap Assessment Working Group on behalf of the Norwegian Space Agency. Dr. Jost's work continues to bridge the gap between space exploration and sustainable food production on Earth.

Rastislav KRAMPL

SPEAKER

Rastislav is a highly accomplished R&D leader and project manager with extensive experience in biotechnology, technology prototyping, and electronics. His expertise centers on microalgae applications, where he has guided numerous innovative projects. He led a metabolomic and lipidomic project focusing on Limnospira indica, significantly advancing the understanding of their biochemical composition. Furthermore, his contributions include the design and development of novel microalgae harvesting processes and units, as well as the prototyping of automated processes for increased efficiency and scalability. Rastislav holds the Masters degree in Biotechnology and Electronics from the Slovak University of Technology and has furthered his expertise through experience at Lund University of Technology (LTH). His work consistently demonstrates a strong ability to translate scientific discoveries into practical, technologically advanced and multi-disciplinary solutions within the biotechnology sector.

Dr. Alaa KULLAB

SPEAKER

Alaa Kullab is the Water Process Engineer at Hydromars AB. He obtained his PhD in Energy Technology from the Royal Institute of Technology in Stockholm and has been working since in projects related to water treatment and energy integration. He is involved in several EU research projects on topics of water circularity and resource recovery. His main research interests are water treatment, thermal desalination, membrane technologies and energy efficiency in water systems.

Matthias KURA

SPEAKER

Matthias Kura is a M.Sc. student in Aerospace at the Technical University of Munich. His research interests are life support systems, microgravity experiments, space systems, and astrodynamics. Since his exchange semester at Georgia Tech, he has been working with Prof. Romero-Calvo on magnetic phase separation technologies for microalgae applications in microgravity. He also competed in two competitions to design human-rated missions to the Moon and Mars. Upon graduation, he hopes to pursue a Ph.D. in Aerospace Engineering.

Dr. Kim KUTVONEN

SPEAKER

Solar Foods is a Finnish food-tech company founded in 2017. The company specializes in producing a novel protein called Solein®, which is made using carbon dioxide, hydrogen, water, and renewable electricity — without the need for agriculture, animals, or photosynthesis. Solar Foods is seen as a pioneer in the field of air-based proteins and a key player in sustainable food innovation. Kim Kutvonen is currently working as an Exploration Systems Engineer at Solar Foods. He has worked on conceptual planning, design, analytical modelling and hands-on development of the Solar Foods space bioprocess. He holds a master's in biotechnology from Aalto University and is currently undertaking a PhD at Solar Foods. Arttu Luukanen is the SVP of Space & Defence at Solar Foods. He has previously served as Research Professor at VTT, directed MilliLab, an ESA external laboratory, and served as CEO of Asqella Oy. Luukanen holds a Ph.D. in Applied Physics from the University of Jyväskylä and is an elected member of the Finnish Academy of Technology. Juha-Pekka Pitkänen is one of the founders of Solar Foods and the Chief Scientific Officer. Pitkänen tested the functionality of the technology used as the basis of Solar Foods during his time at VTT on a laboratory scale together with his colleagues. Petri Tervasmäki works as the Chief Technology Officer at Solar Foods. Tervasmäki has been working at Solar Foods since 2019, and he has played a pivotal role in the development of the company's gas fermentation processes and scaling production from pilot to commercial scale.g.

The content of the presentations was provided by the Key speakers and Speakers.

Joanna KUZMA

SPEAKER

Joanna Kuzma graduated in Chemical Engineering from Wrocław University of Technology. She completed her PhD jointly at Université Clermont Auvergne and Universitat Autònoma de Barcelona within the POMP3 program, supported by the MELiSSA Foundation and CNES. Her doctoral research focused on investigating how gravity, airflow, and inclination affect heat and mass transfer between plants and their environment. Before starting her PhD, Joanna worked as a Young Graduate Trainee at the European Space Agency (ESA) on the MELiSSA Project. During her academic career, she participated in several space-related projects, with a strong focus on life support systems and plant cultivation in controlled environments.

Dr. Sophie LABONNOTE-WEBER

SPEAKER

Dr. Sophie Labonnote-Weber has a MSc in aeronautical engineering and a PhD in materials science, with focus on ceramic materials. After more than 8 years of experience in ceramic processing, she currently holds a position as a research manager (senior researcher) in CIRiS with a focus on market and innovation, technology development, including design of space flight hardware, and high level system studies in the context of resource utilization.

Prof. Valérie LEGUÉ

KEY SPEAKER

Valérie Legué is a professor and researcher at the University Clermont-Auvergne. She is working in the team which is expert on the effect of wind and gravity on plant posture. Her research is focused on root system development and the perception of gravity in root. She is involving in space experiments supported the ESA and the CNES since many years.

The content of the presentations was provided by the Key speakers and Speakers.

Dr. Natalie LEYS

SPEAKER

Dr. ir. Natalie Leys is a senior scientist at the Belgian Nuclear Research Centre (SCK CEN), where she leads research in space microbiology and nuclear biotechnology. She holds a PhD in Bioscience Engineering and has over 20 years of experience in space life sciences. Dr. Leys has coordinated multiple ESA-supported experiments aboard the International Space Station. Her space research focuses on microbial systems for regenerative life support, including oxygen production, waste recycling, and food generation in space. She is a long contributor to the MELiSSA Project, aiming to develop closed-loop life support systems for long-duration missions. Her recent research includes the ARTHROSPIRA-C bioreactor experiment and studies on microbial resilience to space conditions. She has authored over 150 peer-reviewed publications and supervises doctoral research in microbial biotechnology. Dr. Leys actively collaborates with international space agencies and academic institutions.

Robert LINDNER

KEY SPEAKER

Robert Lindner studied Chemical Engineering at the University of Karlsruhe (Dipl.-Ing./MSc), specialising in Thermal Engineering and Thermodynamics. He works for the European Space Agency since more than 20 years and has focussed on life support engineering and instrumentation development. For many years he has been working for the ExoMars project as an instrumentation engineer and technology support for several instruments, amongst others the Mars Organic Molecule analyser (MOMA). His interests comprise instrumentation development for manned and unmanned missions (ISS, planetary exploration...), life support system development and In Situ Resource Utilisation. He is currently leading the Life Support and Physical Sciences Instrumentation Section in the Technology and Quality Management Directorate (TEC).

Dr. Hui LIU

KEY SPEAKER

Hui LIU, Ph.D., associate professor, young top talent of Beihang University. In 2017, she obtained a doctoral degree from Beihang University; from 2017 to 2018, as one of the cabin volunteer captains and plant cultivation system leaders of the "Lunar Palace 365" experiment, she completed a 170-day cabin closed experiment. from 2017 to 2020, she was an outstanding postdoctoral fellow in the field of astronautics and technology at Beihang University, and since 2020, she has been an associate professor at the School of Biological Science and Medical Engineering at Beihang University. Dr Liu has long been facing crewed deep space exploration bioregenerative life support, and has carried out a lot of research work on the cultivation of higher plants in extraterrestrial closed, special gravity, strong radiation, and wake magnetic field environments, including basic theory and technical methods. Relevant research results have been published 34 academic papers in top journals in the field such as Acta Astronautica, Science Buliten, Scientia Horticulturae and so on.

The content of the presentations was provided by the Key speakers and Speakers.

Cesare LOBASCIO

KEY SPEAKER

Cesare Lobascio graduated in Nuclear Engineering at Politecnico di Torino (Italy, 1987), and then obtained a MS in Environmental Engineering at the University of California in Berkeley in 1993. He has worked for >35 years at Thales Alenia Space in Italy, in the broad fields of Space Environment and Life Support Systems, covering a wide range of technical and management roles. He has been involved in the International Space Station project, on scientific satellites and human and robotic space exploration studies for the Moon and Mars. He is Senior Expert in "Life Support & Habitability", teaches at the Space Exploration Master, authored more than 100 publications including papers, book chapters and 2 patents.
As the Innovation Leader for Space Exploration and Science, within the Innovation Cluster, he animates and coaches teams of innovation fellows through events, hackathons, creativity sessions, incubation of innovative ideas, ventures and open and business innovation initiatives with start-ups. He has co-founded and is currently supporting the Space Business Catalyst accelerator antenna in Torino.

Elena LUCIANI

SPEAKER

She received a classical education in Greek, Latin, art, and literature, sparking a profound interest in culture and literary heritage. Currently studying at the Faculty of Food Science and Human Nutrition at the Università Campus Bio-Medico di Roma, she has traveled the world on business, discovering diverse food and wine traditions. Her passion for wine, combined with her fascination for space exploration and human health, drives her to explore dietary challenges and innovative nutritional solutions. Through these experiences, she has cultivated an open-minded, multicultural outlook, merging tradition and innovation to promote wine culture and advocate for a conscious, well-informed lifestyle.

Kaia MACLEOD

SPEAKER

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Fabio MAGRASSI

SPEAKER

Elena Maria CAMPANARO

SPEAKER

Elena Maria Campanaro is an ESA Graduate Trainee in the Life Support and Physical Sciences Instrumentation Section at ESA, in ESTEC, working as an Environmental Control and Life Support Systems Engineer in the framework of the MELiSSA Project. She holds a Bachelor of Science in Physics from the Goethe Universität Frankfurt, Germany, and a Master of Science in Aerospace Engineering from ISAE Supaero, France. With 2 years of work experience in the Space and Defence industry (Rheinmetall and ESA), Elena specializes in Space Systems and is very passionate about human spaceflight.

The content of the presentations was provided by the Key speakers and Speakers.

Riccardo CAPOLLA
SPEAKER

Energy and Sustainability Project Manager
Riccardo Capolla is a Project Manager at STAM. He obtained his Master's degree in Industrial Biotechnology from the University of Padua in 2019. Since 2018, he has been working in the fields of Open Innovation and innovation consulting for companies operating in research-intensive sectors. Over the years, he has developed strong expertise in bioeconomy, circular economy, and environmental sustainability, with a particular focus on technology transfer across different sectors and toward the market.

Erik MAZZOLENI
SPEAKER

Erik Mazzoleni has a Master Degree in Mathematical Engineering. He is Project Manager and Business Unit Manager in EnginSoft. He coordinates several research and industrial projects related to system engineering. He is responsible of a team CFD engineers developing projects in different industrial sectors: HVAC (heat transfer, ventilation systems, air conditioning systems), Multi-phase flows (free surface flows, cavitation, DEM), Food packaging (sterilization process, filling and cooling), Process Industry (LNG plants, Scrubbers, Reformers), Iron making (water cooling system), Valve design for Oil&Gas pipeline (water hammer effect).

Orsolya MEIER
SPEAKER

Born on May 20, 1996, in Hungary, Orsolya Meier is a food engineer specializing in biotechnology and a PhD student at the University of Debrecen, Department of Applied Plant Biology. Her doctoral research focuses on the intersection of nutrition and food science, emphasizing space agriculture and the development of sustainable food systems for extraterrestrial environments. Orsolya holds both a BSc and MSc in Food Engineering from the Hungarian University of Agriculture and Life Sciences, with a postgraduate specialization in Innovative Nutrition and Space Health Science from UniSpace Hungary. She currently works as a Quality Risk Management Associate at Egis Pharmaceutical PLC and serves as a cooperative PhD intern with Orion Space Generation Foundation / Csillagváros Kft. A dedicated advocate for space research, Orsolya is an active member of the Hungarian Astronautical Society and a former mentee of the United Nation's UNOOSA Space for Women mentoring program. She has further honed her expertise by completing the ESA Academy's Human Space Physiology training course. Orsolya's diverse accomplishments reflect her passion for advancing both terrestrial and space-bound food sciences.

Mr. Jan MIKOŁAJCZYK

SPEAKER

Jan Mikołajczyk is a dual-degree student of Physics at the University of Warsaw and Aeronautical & Astronautical Engineering at the Warsaw University of Technology. Working at the intersection of environmental acoustics, robotics and in-situ resource utilisation, he has led multiple technology projects that have earned international distinction—including a special prize at the EU Contest for Young Scientists (EUCYS 2022)—and secured competitive funding from the Polish National Centre for Research and Development (NCBiR). Since 2023 Jan has managed Snow's Eye, a modular acoustic-radar–spectroscopic payload that delivers kilogram-level water-ice inventories for MELiSSA-class life-support and ISRU missions. He coordinates a multinational consortium comprising the Institute of Geophysics, Polish Academy of Sciences; NORCE – Norwegian Research Centre; the University Centre in Svalbard (UNIS); and partner institutes in Finland, steering the instrument from Arctic ground campaigns toward space qualification. Beyond planetary prospecting, Jan co-develops an autonomous network of underwater vehicles for cooperative surveying and environmental monitoring. This programme reinforces his expertise in multi-agent control, low-power sensing and data-fusion architectures—skills directly transferrable to orbital and surface-exploration systems. He has co-authored conference papers on UAV-borne snow-water-equivalent mapping, mentors student engineering teams and advocates open-hardware approaches to space science. Jan's long-term goal is to translate robust Earth-based measurement techniques into flightready tools that enable a sustainable human presence beyond our planet.

Kyriaki MINOGLOU

KEY SPEAKER

Kyriaki Minoglou is currently the Head of the Optics, Robotics and Life Sciences Division within the Directorate of Technology, Engineering and Quality at the European Space Agency.
Kyriaki Minoglou received a master's degree in electrical engineering in 2000 from the Aristotle University of Thessaloniki in Greece and a master's degree in microelectronics in 2002 from Ethnikon kai Kapodistriakon Panepistimion Athinon in Greece. She obtained a PhD in Optoelectronics in 2007. Kyriaki Minoglou joined ESA in 2014S and has more than 20 years' experience in space imaging payload and detector technology development.

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Katarína MOLNÁROVÁ

SPEAKER

Katarína Molnárová holds a Bachelor's degree in Molecular Biology and a Master's degree in Plant Physiology. She is currently pursuing a PhD at Mendel University in Brno within the interdisciplinary research group Space Agri Technologies. Her doctoral research focuses on the physiological and stress responses of microalgae, cyanobacteria, and plants under simulated space conditions, including UV radiation, desiccation, ionizing radiation, and altered gravity (microgravity and hypergravity). In addition to exploring biological adaptation in space, her work addresses practical challenges in space agriculture, such as regolith remediation—specifically perchlorate and heavy metal detoxification— and sustainable plant cultivation in extraterrestrial soils. She is also engaged in smart farming approaches, integrating artificial intelligence to optimize resource use and crop productivity in both terrestrial and space-based systems. Katarína is actively involved in several spaceflight projects, including the CIMER satellite mission, two upcoming experiments aboard the International Space Station, and a payload development for ESA's Space Rider platform. She also serves as Vice-Chair of the Slovak Organisation for Space Activities (SOSA), where she helps promote space research and outreach in Central Europe. Her work supports the advancement of bioregenerative life support systems and contributes to the long-term vision of sustainable human presence beyond Earth.

Dr. Antonielle MONCLARO

SPEAKER

Dr. Antonielle Monclaro is a postdoctoral researcher specializing in fungal enzymology and microbial biotechnology for biomass conversion. She currently works at Ghent University (Belgium), focusing on the development of advanced enzymatic systems for lignocellulose deconstruction using thermophilic fungi and ionic liquid-based pretreatments. She is also affiliated with the University of Brasília (Brazil), performing transcriptomic analyses of fungal CAZymes involved in lignocellulose degradation. Dr. Monclaro was previously a Maria Zambrano Fellow at Universidad Politécnica de Madrid (Spain), where she worked on the cloning and expression of CAZymes from Zymoseptoria tritici. At Ghent University, she focused on the cultivation of aerobic thermoacidophilic archaea in reactor and the adaptive laboratory evolution of methanogens. Her earlier postdoctoral work at Université Libre de Bruxelles (Belgium) focused on the proteomics and functional analysis of Neurospora crassa CAZymes to enhance photobiocatalytic biomass degradation. She also worked at EMBRAPA Agroenergy (Brazil) engineering microbial strains to produce biomassdegrading enzymes.

Géraldine NAJA

KEY SPEAKER

From France, Ms Naja has 30-year experience in the European space sector in managerial and strategy development positions.
She graduated from the French École Polytechnique with a degree in engineering and then from École Nationale Supérieure de Techniques Avancées (ENSTA) with a Masters degree in propulsion and chemistry. She also has a Masters degree in political sciences from the Institut d'Etudes Politiques de Paris (Sciences Po). She joined ESA in 1987 as a Payload Operations Engineer in the Space Station Directorate. She then served in various corporate and programmatic functions across the Agency between 1993 and 2015, including Head of Long-term Space Policy Office, Head of Strategic and Institutional Matters in the ESA Director General's Cabinet, Head of EU Relations Office, and Senior Advisor to the Director of Launchers. She was also seconded from ESA for one year (2003-4) as Advisor for the Cabinet of the French Minister of Research and Higher Education.
Before her latest appointment, Ms Naja was Head of the ESA's Industrial Policy and Audit Department since 2015. She served as acting Director when the new Directorate of Commercialisation, Industry and Procurement was created in May 2021, in response to the Director General's Agenda 2025 for the future development of ESA, with commercialisation as one of its strategic priorities. She is responsible for elaborating and implementing ESA's industrial policy, the agency's procurement rules and policies, and conducting negotiations and managing procurement for all activities and programmes, as well as enabling and boosting European space commercialisation ambitions through innovative tools.

Prof. Hristo NAJDENSKI

SPEAKER

Prof. Hristo Miladinov Najdenski, DVM, DSci Member of the Bulgarian Academy of Sciences, Sofia, Bulgaria
E-mail: hnajdenski@gmail.com.bg
Graduated the Veterinary Faculty at the Trakia University (Stara Zagora, Bulgaria) and obtained the scientific degree Doctor of Veterinary Medicine Sciences (DSci) in 2011, specialty of Microbiology. Good experience in managing and coordinating of various scientific activities - research, organization, management and coordination of national and international scientific events (symposia, congresses, seminars, etc.), development, implementation and reporting of scientific projects and programs, training of doctoral students and bachelors, conducting of practical and theoretical courses in infectious microbiology, molecular biology, etc. Director of the Stephan Angeloff Institute of Microbiology, Bulgarian Academy of Sciences (SAIM-BAS) in the period 2012-2019. Head of Department Infectious Microbiology at SAIM-BAS.

The scientific interests are in the field of pathogenic bacteria, food-borne zoonozes, virulence factors, bacterial-host relationships, infectious immunology, molecular biology, ecology of pathogenic bacteria, new antibacterial agents, antimicrobial resistance. Recognized multidisciplinary and international achievements in the fields of 1) pathogenesis of socially important zoonotic infections, 2) host immune response after experimental infection and/or gamma irradiation. 3) development of experimental animal models – mice, rats, rabbits, guinea pigs, golden hamsters, ground squirrels, cocks, pigs, cheeps, lambs; 4) development of novel live carrier vaccines by targeted attenuation of Yersinia; 5) development of fast and reliable molecular methods for detection, typing and quantification of food-borne pathogens in meat, milk; feces, etc.; 6) Studies on antibacterial activities of different compounds of natural or synthetic origin. Author and co-author of 314 publications (of which 209 published in international and 105 in Bulgarian journals, H factor – 28, citations - > 2500.

The content of the presentations was provided by the Key speakers and Speakers.

Mr. Ahsan NASIR

SPEAKER

Ahsan Nasir is a chemical and process engineer working at The Spring Institute for Forests on the Moon for the simulation of the Marshian Project, supported by the French Space Agency, currently completing an Erasmus Mundus Master's in Biological and Chemical Engineering for a Sustainable Bioeconomy (Bioceb), coordinated by AgroParisTech, Gembloux Agro-Bio Tech (ULiège), and the University of Reims Champagne-Ardenne. His academic and research interests lie in bioprocess engineering, biomass valorization, and sustainable waste treatment technologies for terrestrial and space applications. With hands-on experience in enzymatic hydrolysis, lignocellulosic biomass utilization, and stoichiometric modeling, Ahsan is passionate about developing closed-loop, resource-efficient systems that align with circular economy principles. He is currently working on his master's thesis at the University of Clermont-Auvergne in Clermont-Ferrand, France, where he is simulating bioregenerative wastewater treatment systems for future lunar habitats.

Marc OBÉRON

KEY SPEAKER

Marc Obéron is a television and film producer. In 2011, he founded the Cinema for Change festival, an event dedicated to social debate through cinema, bringing together experts and influential figures to engage with the public. This event is an extension of the humanist values he advocates. Cinema for Change presents films that address the challenges our planet faces today, with the desire to reflect together on a future that inspires change.
The Sustainable Development Goals are the Festival's editorial line. Aware that without rapid and ambitious action, climate change represents an irreversible threat to humanity, Marc Obéron uses the emotional power of cinema to raise awareness. His mobilization efforts are focused on cinema, business, and youth, considering education as the foundation of all development.

Dr. Lydia ONG

SPEAKER

Dr Lydia Ong is a senior research fellow at the Australian Research Council Centre of Excellence in Plants for Space (P4S). In her earlier career with the Dairy Innovation Hub at the University of Melbourne, Dr Ong developed significant research capability for the study of food microstructure, supporting food and dairy manufacturers in process improvement and product innovation. She has contributed over 75 publications in food microstructure, demonstrated approaches in structuring of dairy and plant-based ingredients and was awarded multiple prestigious awards, including the ICM Agrifood Award and the Dairy Innovation Australia research excellence award for her work. Dr Ong joined P4S in 2024 and her current research focusses on designing novel plant-derived foods based on a detailed understanding of the structure of plant materials and how they respond to processing. P4S is an international research consortium, which aims to re-imagine plant design and bioresource production through the lens of space, paving the way for off-earth habitation while delivering innovation that can enhance sustainability on Earth.

The content of the presentations was provided by the Key speakers and Speakers.

Sonia PALOMO

KEY SPEAKER

Sonia Palomo is the Director of Technology Transfer and International Relations at MálagaTechPark (Parque Tecnológico de Andalucía). Since joining in 1998, she has been a driving force behind the park's growth, specializing in innovation, technology transfer, and international collaborations. Sonia is responsible for designing and implementing European and international projects, fostering technology clusters, and expanding the park's global presence.

Beyond her role in technology transfer, Palomo is deeply committed to sustainability and has played a key role in making Málaga TechPark a leader in circular economy initiatives. She actively promotes sustainable innovation, resource efficiency, and eco-friendly business practices, ensuring the park adapts to modern environmental challenges while maintaining its status as a global technology hub.

She holds a degree in Business and Finance from the University of Málaga and a degree in Social and Cultural Anthropology from UNED. Fluent in Spanish, English, French, and Portuguese, she is a vital figure in the park's international relations. In 2024, she was awarded the Entreprise Prize for her contributions to Málaga TechPark's expansion across 211 cities in 77 countries.

Dr. Antonio PANNICO

SPEAKER

Antonio Pannico has been a Researcher in Horticulture at the Department of Agricultural Science of the University of Naples Federico II, Italy (UNINA) since 2021. He obtained a Master's degree in Horticultural Science in 2008 and a PhD in Science and Technology of Agri-Food Production at the Department of Agricultural Science in 2014. From 2014 to 2021, he worked as a postdoctoral fellow at the same institution. He teaches Horticulture and Floriculture at UNINA and supervises MSc and PhD students. From January to June 2017, he was a Visiting Scientist at the MELiSSA Pilot Plant (MPP) at Universitat Autònoma de Barcelona (Spain) and, from July 2023 to January 2024, he was a Visiting Scientist at the Leibniz Institute of Vegetable and Ornamental Crops, Großbeeren (Germany). His field of expertise is related to greenhouse management, eco-physiology, and the production of vegetables with a particular emphasis on indoor cultivation systems. He has been involved in research works concerning: performance and quality of crops, hydrological characteristics of plant substrates, higher plants cultivation in Bioregenerative Life Support Systems in Space (BLSSs), cultivation of vegetables in fully-closed growth chambers, nutritional quality of vegetables, microgreens for space farming, use of biostimulants in horticultural plants under optimal and sub-optimal stress conditions, development of nondestructive methods (NIR spectroscopy) to detect fruit quality (in collaboration with the Wageningen UR – The Netherlands). Since 2019, he has been the manager of the "Laboratory of Crop Research for Space" (scientific head: prof. Stefania De Pascale), dedicated to the characterization of plants for BLSSs, established at the Department of Agricultural Science (UNINA) by collaboration with ESA within the MELiSSA program. He is the author of more than 90 papers published in international peer-reviewed journals and is Associate Editor of Frontiers in Plant Science, section Crop and Product Physiology.

The content of the presentations was provided by the Key speakers and Speakers.

Enrique PEIRO

SPEAKER

Enrique Peiro is the Technical Manager of the MELiSSA Pilot Plant, located at the Department of Chemical Engineering at Universitat Autònoma de Barcelona (UAB) since 2006. He holds a degree in Pharmacy, with Bachelor's Thesis in Industrial Microbiology, from the Universidad Complutense University de Madrid. He worked as a researcher at the Fermentation Pilot Plant of the company ANTIBIÓTICOS S.A. (1986–2005) in León, Spain on several fermentation projects, and later as Manager of the aforementioned plant (2005–2006), coordinating a team of up to 20 workers and technicians. He was appointed Project Leader for some of the company's strategic projects, such as Vitamins and Natural biopigments (1997–98), and Clavulanic acid (1997–99), coordinating R&D, Engineering, Quality, and Production activities. He moved to Shanghai, China, for the start-up of the ANTIBIÓTICOS – PIONEER PHARMACEUTICALS Joint Venture, as responsible for Technology transfer and Assistant Manager of Industrial Fermentation (2001–2005). He has collaborated as a fermentation specialist with many other companies in the biotechnology field in Spain (probiotics, serum products, and other active compounds), pharmaceutical laboratories, and as a consultant for the design of fermentation facilities and the commissioning of equipment.

Martin PERSSON

KEY SPEAKER

Biotechnologist with 25-years of experience in the Danish biotech industry. The Ph.D. thesis focused on prokaryotic gene technology, especially on bacterial mRNA stability and its effects on gene expression in Bacillus subtilis. The first encounter with industry was in 2000, with the Danish pharmaceutical company Novo Nordisk, but after only a month in Novo Nordisk, Novozymes was founded after a spin out of the Enzyme Business. Much later, in 2023, Novozymes and Danish bioscience company Chr. Hansen merged, and the new combined company is now named Novonesis. The career started as a Research Scientist in Fermentation Development working with microarrays to study global gene expression on the transcriptional level in bioreactors and optimizing fermentation processes. Later fermentation optimization was also done in pilot plant scale, including upscaling of processes to production scale. Then, department manager jobs followed, both in both Automation Technology, focusing on assays and production strain cloning using liquid handlers, and in Fermentation Technology. Recently, a possibility emerged to join the Acetate-2-Food project as Department Manager and Project Leader for a department in Novonesis that focuses on strain development and small-scale fermentation methods. Novonesis is since approximately 1.5 years one of several partners in the Acetate Consortium, funded by the Gates foundation and the Novo Nordisk foundation, where upstream partners in the consortium work on producing green acetate, while Novonesis develops microorganisms that ferment the acetate into protein, thereby closing the loop to make the project a true Power-2-Food project.

Boris PETROVIC

SPEAKER

Boris Petrovic Co-Founder of Veganaut Inc (Texas USA), Founder of the Nikola Tesla Institute (Brasilia/Sao Paulo Brasil), Founding member of GLXP Team SYNERGY MOON. Boris worked in a number of embedded tech and automation systems startups as a software engineer and architect. As the Founder of the Nikola Tesla Institute he works in research and development of new energy sources, wireless energy transmission and increasing of human energy. Currently, he promotes the great scientist Nikola Tesla as a virtual being in the metaverse with a virtual reality AI platform called TESLAI. His organization ExoTesla develops Virtual Reality simulations and metaverse applications. Linkedin Profile: https://www.linkedin.com/in/borispetrovic/ Davi Souza Linkedin Profile: https://www.linkedin.com/in/daviafs/

Luke PILACHE

SPEAKER

Luke Pilache is a former graduate student at CentraleSupélec - Laboratoire de Génie Industriel (France), with a focus on system engineering and industrial ecology. With experience in consulting, energy ecosystem transformation, and operational scalability, he aims at participating in cross-topic projects serving a sustainability purpose, involving infrastructures and utilities, through an analytical and strategic lens. His recent work includes the Caux Seine case study to develop a territory-scale model and decision making tool for its water system.

Dr. Dietmar PILZ

KEY SPEAKER

Dr Pilz has over 20 years of professional experience in the European and international aerospace industry, in various engineering and programme management positions in the defence and security sectors and the space community.
He joined ESA from Airbus Defence & Space, based in Immenstaad, Germany. Here he was the Head of Space Chief Engineering and Products, as well as Head of Site for Friedrichshafen, involved in all Airbus Space programmes, and hence in many ESA projects. He managed a team of system engineers, product managers and end-to-end data managers across Europe and working in exploration, telecom, navigation, Earth observation and science projects, from Copernicus to Juice, Galileo SG to MetOp-SG and from ACES to the Orion European Service Module. Previously at Airbus, he was Head of AstroBus and EO/Science/Exploration, and Head of Payloads and Life Support Systems. Educated at the University of Ulm, Germany, and the University of California, Los Angeles, he has a PhD and Diploma in Electrical Engineering. He worked as a research scientist on microwave and antenna applications at Rockwell Scientific in Thousand Oaks, USA, before joining the former EADS in 2003.

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Giorgia PONTETTI

SPEAKER

Giorgia Pontetti is an electronic engineer and astronautical engineer with over twenty years of experience. She is the Sole Director of G & A Engineering, a PMI that operates in the sector of Special Equipment for aerospace, defense and automotive, since its establishment, as well as Technical Director of Ferrari Farm Società Agricola, a new generation agricultural company with sterile hydroponics systems completely computerized unique in their kind in all of Europe. She has been studying and researching in the closed-cycle hydroponics sector in sterile, hermetic and computerized environments for over 15 years and is considered a pioneer in her sector for both terrestrial and space applications in future long-term missions and in the colonization of other planets such as Mars or the Moon. A lover of technology because it is a source of innovation and continuous change and of Nature because it is rich in traditions and guardian of ancient knowledge. Vice President and Secretary of the Space Exploration, Moon, Mars, Launchers Commission of the Order of Engineers of the Province of Rome, Member of the Board of Women 4 Cyber Italia ETS and Vice President of the DMO Restart Turismo Rieti Anima Reatina.

Benoît POUFFARY

KEY SPEAKER

Benoît Pouffary is currently the Head of ExPeRT (Exploration Preparation, Research and Technology) within the Human and Robotic Exploration Directorate at the European Space Agency.

Benoit Pouffary received his master's degree in engineering in 2001 from École Centrale de Lyon in France. In 2014, he obtained a PhD in cavitation, turbomachinery and CFD from Institut National Polythechnique de Grenoble in France. Benoit Pouffary joined ESA in 2018 and brings expertise from previous roles at the French Space Agency.

Dr. Lucie POULET

SPEAKER

Lucie Poulet is a researcher in bioastronautics and life support processes at Université Clermont Auvergne Institut Pascal (France). Her research focuses on understanding heat and mass exchange between plants and their environment in reduced gravity, using a mechanistic modeling approach. She then uses these models to optimize the design of systems, such as space greenhouses. To validate these models, she has tested experiments in parabolic flights and is currently preparing a new experiment for the International Space Station. For 15 years, her research has had applications in the field of bioregenerative life support systems for space missions, and she has collaborated closely with various space agencies (NASA, ESA, CSA, CNES, DLR) and laboratories, particularly within the framework of the ESA MELiSSA (Micro-Ecological Life-Support System Alternative) project. She worked as a postdoctoral researcher at NASA in the Space Crop Production group at the Kennedy Space Center (Florida, United States) from 2019 to 2022. Her research led her to participate in four Mars mission simulations, including a 4-month one funded by NASA within the HI-SEAS (Hawaii Space Exploration Analog and Simulation) program. Lucie Poulet holds a PhD from the University of Clermont Auvergne since 2018, a Master's degree in Aerospace Engineering from Purdue University (United States) and a Master's degree in general engineering from the École des Mines de Nancy (France). A volunteer firefighter and holder of a private pilot's license, Lucie devotes her free time to outdoor activities such as hiking and diving, but also practices CrossFit.

Dr. Sabastia PUIG

KEY SPEAKER

Sebastia Puig raduated in Chemistry at the Universitat de Girona (UdG) in 2002, where he also pursued PhD studies. Research work during his PhD involved scientific stays at TU Delft (The Netherlands) under the supervision of Prof. Dr. Ir. Mark C.M. van Loosdrecht. Sebastia Puig's academic career continued with two postdoctoral positions at TU Delft (The Netherlands) and Catalan Institute for Water Research (Spain) in the period 2008-2010 thanks to a Beatriu de Pinós Fellowship. In 2010, Sebastia Puig came back to the UdG holding the position of Assistant Professor including a secondment at Ghent University (Belgium) under the supervision of Prof. Dr. Ir. Willy Verstraete. In 2014, he received the award "Young talented researcher in Sustainable Water Management" from Fundación Botin (Spain). In 2019, Sebastia Puig got the position of Associate Professor Serra Húnter at UdG and the award of ICREA Academia. Currently, Sebastia Puig is interested in giving a second chance to contaminated water and recalcitrant carbon dioxide streams using bio-electrochemical platforms.

The content of the presentations was provided by the Key speakers and Speakers.

Prof. Korneel RABAEY

SPEAKER

Korneel Rabaey (20/11/1977) is professor at the Department of Biotechnology at Ghent University (https://traslab.ugent.be) as well as honorary professor at The University of Queensland. He is one of the founders of CAPTURE (www.capture-resources.be), a centre focusing on resource recovery in the fields of Water, Carbon Capture and Utilization and Plastics to Resource. He is one of the founders of HYDROHM (www.hydrohm.com), a company focusing on electrification in the water sector as well as Electricon, a company focusing on sustainable CO2 capture . Over his 20 year career, he has scaled up or been involved in scaling up multiple technologies to pilot scale including bioelectrochemical systems for caustic production, metals recovery from problematic waste streams and production, nitrogen recovery and so on.

Jonathan RAECKE

KEY SPEAKER

Jonathan Raecke holds a Diploma degree in Mechanical Engineering with a focus on Simulation Methods in Mechanical Engineering from the Technical University. His diploma thesis was conducted in collaboration with the Planetary Infrastructure Group at the German Aerospace Center (DLR) in Bremen, led by Professor Daniel Schubert, and focused on airflow simulations and design improvements for the atmospheric management system of a conceptual lunar BLSS module. Following this, he joined the Laboratory of Automatic Control and System Dynamics (ACSD), led by Professor Stefan Streif at Chemnitz University of Technology, as a Doctoral Researcher in 2023. The ACSD lab conducts interdisciplinary research at the intersection of engineering, biology, and environmental science. A central focus lies on Controlled Environment Agriculture and circular food production systems, for which the team develops dynamic models and advanced control strategies. These efforts aim to optimize resource efficiency, close biological and material cycles, and contribute to sustainable food production - both on Earth and in future space missions. Within this context, Jonathan Raecke focuses on mechanistic modeling and optimal control of multitrophic food systems to enhance their operational efficiency and exploit synergistic resource flows.

Cécile RENAUD

SPEAKER

Cécile Renaud is a PhD candidate in the "Microbiology and Proteomics" laboratory at the University of Mons, under the supervision of Professor Ruddy Wattiez. She holds Master degrees in Marine Biology and Bioresources from Paris-Sorbonne University, and in Innovation Management from AgroParisTech. As part of the European Space Agency's MELiSSA Project, her research focuses on the effects of the space environment on Limnospira indica (Spirulina) and explores the potential of this cyanobacterium as a biostimulant to enhance plants productivity and stress resilience in edible plants, both for terrestrial agriculture and future space missions.

The content of the presentations was provided by the Key speakers and Speakers.

Dr. Eva REYNAERT

KEY SPEAKER

Eva Reynaert is an environmental engineer with a focus on sustainable water reuse, in which technologies achieve just the right level of treatment for specific end uses of reclaimed water and can be monitored effectively to ensure the protection of human and environmental health. She holds a Ph.D. from ETH Zurich. Prior to her current role as a postdoctoral researcher at the German Environment Agency, Eva spent seven years researching on-site water reuse at the water research institute Eawag.

Michel RIECHMANN

SPEAKER

Michel Riechmann is co-founder and CEO of Ogmo – Sanitation Anywhere, a spin-off company of the Swiss Federal Institute of Aquatic Science and Technology (Eawag). Trained as an environmental engineer, he conducted research and field trials in the Blue Diversion Autarky project at Eawag. In the Circular Flow Technologies project, he later coordinated technology transfer and was responsible for business development, leading to the founding of Ogmo. Besides his professional work, he is a working group leader at the Swiss Network for Circular Sanitation (Valoo) and a board member of the German Network for Circular Sanitation (NetSan).

Georgina RIU PUCHE

SPEAKER

Georgina Riu is a Spanish aerospace engineering student currently pursuing her Master of Science at ISAESUPAERO in Toulouse, France. Passionate about space exploration, she is dedicated to developing sustainable technologies for long-term human presence beyond Earth. Georgina has actively participated in numerous multidisciplinary projects, including the design and development of a lunar rover as the leader of the SupaeroMoon team and mission analysis for Venusian atmosphere exploration during the ESA Concurrent Engineering Challenge. She is also an Analog Astronaut in the World's Biggest Analog Mission, where she explores the complexities of astronaut well-being in extreme environments. Her research interests span Environmental Control and Life Support Systems (ECLSS), spacecraft docking mechanisms, and trajectory design for interplanetary missions. Currently, she is preparing for a PhD focused on developing advanced control algorithms for Random Positioning Machines (RPMs), enabling partial gravity simulations for plant biology research. Georgina is motivated by her vision of creating sustainable space systems to support human and biological life in space. With a collaborative mindset and a passion for innovation, she aims to contribute to groundbreaking advancements in aerospace and inspire future generations.

The content of the presentations was provided by the Key speakers and Speakers.

Dr. Luke ROBERSON

SPEAKER

Dr. Roberson is the NASA BLiSS Activity Lead within the Mars Campaign Office's Surface Systems Domain. His research focuses on wastewater treatment and water purification using bioreactor technologies to build a bioregenerative approach to surface system operations on the Moon and Mars. In his 20 years as a researcher at NASA, Luke has 17 issued patents and around 50 peer reviewed scientific papers on space flight technologies.

Dr. Ermes ROMANO LEONE

SPEAKER

Leone Ermes Romano (Avellino, 10 November 1992) is an Italian astrobotanist whose work has bridged advanced plant science and human spaceflight. Educated at the Department of Agricultural Sciences of the University of Napoli "Federico II," he graduated (final grade 110/110) in Agricultural Sciences (2018) and earned a PhD in Food Science in May 2024 with a thesis entitled: "Superfood for space: New method and system for automated cultivation of Wolffia globosa in human spaceflight" From 2020 to 2024, Leone was Principal Investigator of ESA's "Superfood for Space" project and CORA Wolffia Hyper-g, conceiving experimental hardware and directing growth, nutritional and transcriptomic analyses of Wolffia under simulated micro-g, lunar g and hyper-g on the large-diameter centrifuge at ESA-ESTEC. These studies yielded multiple peer-reviewed papers (h-index 7 by April 2025) and a Scientific Reports article that entered the journal's "Top 100 Downloaded" list in 2024, while his doctoral work received a special mention for best thesis in 2025. Leone's research has established Wolffia as a gravity-adaptive crop, strengthening the scientific foundations for future bioregenerative life-support systems.

Alvaro ROPERO LOPEZ

SPEAKER

Álvaro is a biologist with an interest in biological embedded systems and a passion for space exploration. He recently obtained his MSc Bioinformatics & Biocomplexity, with a major in fungal genomics and a minor in science communication, at Utrecht University. Most relevantly, he is a founding member of The Spring Institute for Forest on the Moon, where he partakes in different projects and experiments at the frontier of biological closed support systems and lunar regolith based agriculture.

Carla RUIZ-GONZALEZ

SPEAKER

Carla Ruiz-Gonzalez is a PhD student at the University of Edinburgh and the Scottish Association for Marine Science (SAMS), specializing in the physiology and metabolomics of cryophilic snow algae under extreme environments. As part of the NERC E4 Doctoral Training Partnership, her research focuses on the metabolic plasticity and adaptability of snow algae to simulated extraterrestrial conditions, with applications for Biological Life Support Systems (BLSS) in space exploration. With extensive experience in algal biology, environmental microbiology, and biochemistry, Carla previously had roles as Laboratory Manager and Microbiology Support Scientist at SAMS, contributing to projects on macroalgal biorefinery, sustainable food packaging, and seaweed industry development. Her technical expertise spans advanced analytical techniques such as gas chromatography-mass spectrometry (GC-MS) and high-performance liquid chromatography (HPLC), as well as molecular and aseptic techniques, and microscopy. Her research presented at the MELiSSA conference focuses on the physiological and metabolic responses of two snow algae isolates—Limnomonas sp. and Chloromonas sp.—to Lunar light cycles, consisting of 14 Earth days of light followed by 14 days of darkness, under both axenic and xenic culture conditions. By combining these experiments with simulated microgravity and partial gravity using a 3D clinostat, she explores how these conditions impact growth, pigment production, changes in metabolism, and stress-related compounds. Her work addresses critical challenges in designing space-based bioreactors, shedding light on the adaptability of snow algae to Lunar-like environments and their potential role in oxygen production, carbon fixation, and biomass generation. Carla's findings emphasize the potential of snow algae as resilient candidates for BLSS, contributing to the sustainability of future on Lunar and Martian habitats. Proficient in Spanish, Valencian, and English, she is committed to advancing knowledge at the intersection of marine science, astrobiology, and applied biotechnology.

Arnaud RUNGE

SPEAKER

Piero SANTORO

SPEAKER

Piero Santoro, born in 1982, inventor, entrepreneur and lighting technologist, graduated in industrial design with a specialisation in lighting design and technology, since 2005 he has dedicated his work exclusively to the study of new applications of light in the industrial sector and since 2013 to the world of photobiology applied to agroindustrial and sanitary processes. Co-author of several scientific publications on photobiology applied to agroindustry - https://orcid.org/0009-0003-4797-5745 -https://www.scopus.com/authid/detail.uri?authorId=58453954300 Adjunct professor in light technology applied to agriculture since 2023 at Agritech Academy, University of Naples Federico II and since 2024 at the University of Milan Today he is CEO at MEG Science – www.megscience.com – and CTO at Photo BOtic – www.photob-otic.com.

The content of the presentations was provided by the Key speakers and Speakers.

Gianandrea SCALA

SPEAKER

Gianandrea Scala is currently a master medical student at the university of Siena, Italy. From a young age, he dedicated himself and his work to space research and divulgation, due to personal passion in the field. Other than his career at the University of Siena, he achieved results with Scuola Normale Superiore and Istituto Superiore Sant'Anna of Pisa, IRAS (a scientific institution based in his hometown La Spezia, dedicating to small bodies discovery and educational conferences), European Space Agency, CERN and INFN, working in dynamic and excellence environments that allowed him to further cultivate his passion and knowledge for space. He has also worked in international environments, which increased his passion for embracing different cultures and provided the opportunity to learn Chinese and Russian. Regarding research work, he is currently a member of the University research approval committee, that has the duty of approving or rejecting scientific papers: here he could learn about the world of articles and journals. Recently, he has been taking part in courses and conferences with NASA. He is an alumnus of the National Board of Excellency, a government organization which grants this title to the most competent students in the country.

Mr. Peter SCHEER

SPEAKER

Peter started his career in the Horti- & Agriculture industries. His interest and focus caused him to become an expert in vertical farming. Due to his expertise and enthusiasm he got managing opportunities in Nepal and Egypt. During the execution of those projects he based a lot of his decisions on the local environmental and social conditions. His international experiences in combination with global challenges triggered his entrepreneurial side. Peter aspires to use his expertise, knowledge and experiences to establish sustainable circular economies, with a special focus on developing areas. Working with SEMiLLA IPStar inspired Peter to look further to design a closed loop system combining Yellow, Grey and Black Water Technics and vertical farming. To reach his aspiration Peter founded SEMiLLA Sanitation Hubs in 2017
as a spin out of SEMiLLA IPStar. The start-up is focused on increasing the amount of fresh water and food in a circular way. The world population is growing, and sufficient amounts of food and water are needed. SEMiLLA Sanitation Hubs produces off-grid working modular containers including sanitation, wastewater treatment systems, and food production facilities. This innovation contributes to: the realization of the UN's sixth Sustainable Development goal, the creation of circular economies, pollution reduction, creation of business opportunities, and improvement of the global food security. It's a closed loop concept that provides clean and safe sanitation facilities, and the sanitation wastewater streams are onspot converted into: Reusable water, irrigation water, fertilizers, nutrients and compost. A food production unit can be addon to the container to grow seeds on those outputs. These outputs generate new business opportunities for investors and (local) entrepreneurs. Peter collaborates with organisations to spread awareness about the global water, sanitation and food challenges and the need for change. Additionally, festivals and events provide the perfect opportunities to test the hubs, and spread the word. Currently, Peter puts all his efforts into reaching potential markets to increase his impact and to create a more sustainable world. Some examples where Peter is working on: Water neutral & Sewage less buildings in Silvolde, Heuvelstraat and implementing closed loop systems in Ghana and Uganda with Toilets, Treatment (biogas/compost/irrigation water) and Trees (for regreening, reforestation.

Mona SCHIEFLOE

SPEAKER

Mona Schiefloe holds an MSc in Biology and is currently a PhD candidate in Biotechnology/Biology. She has worked as a Researcher at CIRiS since 2010. Research activities emphasize plant cultivation in closed-loop hydroponic systems for both spaceflight Life Support and Earth applications. This includes resource recycling between biological systems, technology for plant monitoring and -analysis and process control of the plant growth facilities. Of special interest is plant stress and physiological responses to environmental conditions, with a special focus on salt stress and effects of nutrient solution composition. At a higher level the aim of research is to contribute to increased circular economy and sustainable food production both in space and on Earth. Schiefloe has participated in several research projects within the MELiSSA framework, ESA and nationally funded projects in Norway. She also has several years of practical experience from integration and operation of spaceflight projects and is a certified console operator for ESA and NASA for the International Space Station program.

Dylan SCHUN IZUMA

SPEAKER

Dylan graduated in 2023 from graduate school with a specialization in chemistry, focusing on water treatment. Upon entering the workforce, Dylan contributed to the development and orbital operations of cell culture devices and plant cultivation systems, as well as the launch of commercial equipment. In 2025, Dylan transitioned to the ECLSS R&D division, where they are involved in the development of carbon dioxide removal systems and plant cultivation devices.

Dr. Jared STOOCHNOFF

SPEAKER

Dr. Jared Stoochnoff is an Exploration Scientist at the Canadian Space Agency (CSA), specializing in controlled environment agriculture for space missions. He leads the Lunar Agriculture Module - Ground Test Demonstrator (LAM-GTD) planning efforts, a collaboration with the German Aerospace Center aimed at developing a lunar greenhouse for food production in space. His responsibilities include defining system requirements for lighting, irrigation, air management, plant health monitoring, and robotics, as well as managing a team of students at CSA headquarters. Dr. Stoochnoff holds a Ph.D. in Environmental Science from the University of Guelph, where his research focused on controlled environment agriculture. His academic background combines plant science, environmental systems, and technology development—expertise that directly informs his work in advancing sustainable food systems for both space and remote Earth environments.

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Patrik SZATMÁRI
SPEAKER

Patrik Szatmári started his higher education studies in Szeged in 2019. Consciously He studied to become a food engineer and graduated with honours in 2022. During his studies he spent 6 semesters as a demonstrator in Food Physics I-II, and Pulse, Heat and Mass Transfer Operations. His thesis topic was awarded second place in the Faculty TDK 2022 and he was awarded the faculty prize "Innovative Product Development" special prize awarded by the faculty. With the same prize III. place at the 2023 OTDK with the same paper. The topic of the thesis was antioxidant effects fruitbased confectionery gels with antioxidant properties. The topic was included both product development and analytics. She is in the process of obtaining her Master's degree. Master's degree in Food Engineering specialisation in food technology and product development. Her thesis entitled "Rheology of food gelling agents" in the field of food gels. His thesis supervisor was Dr. Ernő Gyimes for the bachelor's and master's degree. He is dedicated to research, reads a lot and is humble.

Michael T. FLYNN
KEY SPEAKER

Mr. Flynn is principal investigator in life support program at NASA Ames Research Center. He has over 35 years of experience in life support systems and 120 peer reviewed publications. He has received an AIAA best space architecture paper award. Four of his papers have been republished in the SAE International's Transactions journal. He has received two R&D 100 Awards, a Wright Brothers Medal, an Arch T. Calwell Merit Award, and a Spock Award. He has received 6 NASA Spotlight awards and 5 NASA patents. He has worked on NASA, the Army, commercial space, and terrestrial green building projects.

Catherine THANNIPPILLY ALEX
SPEAKER

Catherine Thannippilly Alex is passionate about advancing climate-resilient agricultural and food systems. She holds a Master's in Food Systems from EIT Food, with a diverse academic background across Europe and India, providing her with a deep understanding of global agri-food dynamics and a strong foundation in food science and technology. Her Master's thesis focused on integrating space-based BLSS technology with terrestrial food fortification, emphasizing her commitment to circular sustainability. Currently serving as Nutritional Officer for the Asclepius Analog Mission, Catherine has developed expertise in meal planning and nutrient diversification tailored for extreme environments. Her experience in R&D for nutraceuticals during India's Chandrayaan mission further reinforces her dedication to pioneering regenerative space food systems. In presenting this abstract, she aims to contribute insights into the role of circular bio-regenerative technologies in shaping the future of food for both space and Earth.

Lucie THIBAUD

SPEAKER

Lucie Thibaud is a first-year PhD candidate in astrobiology at ZARM (University of Bremen, Germany), where she studies the adaptation of cyanobacteria to space-like environments. Her research focuses on Adaptive Laboratory Evolution (ALE) as a tool to improve cyanobacterial performance under Martian-relevant conditions, including exposure to perchlorates, regolith, and non-terrestrial atmosphere. Before joining her current research group, Lucie earned a Master's degree in microbiology from the University of Lyon (France). Her work contributes to the development of sustainable biological systems supporting in situ resource utilization (ISRU) strategies for future long-duration space missions.

Dr. Tatpong TULYANANDA

SPEAKER

Dr. Tulyananda is a plant biologist from space life science research group, Mahidol University, Thailand. He studied temperature adaptation in plant during his doctoral work at Virginia Polytechnic Institute and State University, identifying traits that enable temperate plants to thrive in warmer climates. In 2017 his laboratory was selected to join Thailand's National Space Exploration (NSE) program. In 2021-2022, the research group joined JAXA KIBO ABC program to conduct tree seeds research onboard ISS. In 2023 he received fellowship from UNOOSA and ESA on plant research for space applications under HyperGES program. The laboratory received opportunity to conduct plant research in orbit under collaboration with CNSA and DSEL using research satellite Shijian-19 in 2024. His research spans the fundamental biology of plant—including general cultivation and its adaptation to extreme space environments such as temperature, gravity and radiation.

Chukwuemeka UKAGA

SPEAKER

Emeka Ukaga is a Tech Professional, Civil/Structural Engineer, and Architect with a strong background in sustainable design, project management, and extreme environments. He specializes on work at the intersection of advanced technologies and the built environment with extensive experience in industrial and advanced facility architectural, engineering, and layout design. He is an inaugural candidate for the EMBA Space Architecture program at TU Wien.

The content of the presentations was provided by the Key speakers and Speakers.

Angelo VERMEULEN

KEY SPEAKER

Angelo Vermeulen is a space biologist, complex systems engineer, computational designer, and artist with a PhD in biology from KU Leuven. As a researcher at TU Delft, he develops bio-inspired and bioregenerative concepts for multigenerational interstellar exploration, including modeling and simulating bioregenerative life support systems for long-duration space missions. He is also the CTO of SpaceBorn United, a biomedical company pioneering human reproduction in space. Vermeulen co-founded SEADS, a cross-cultural collective integrating art, science, and technology. In 2013, he commanded the first NASA-funded HI-SEAS Mars simulation, and in 2022, he reached the final 6% of candidates in the ESA astronaut selection process. His work has earned international recognition, including being named Belgian Tech Pioneer (De Tijd) and receiving a Senior TED Fellowship and the Michael Kalil Endowment for Smart Design Fellowship at Parsons School of Design. He has also received the Witteveen+Bos Art+Technology Award and the International Award for Public Art, and his transdisciplinary projects with SEADS have been sent multiple times to the International Space Station. He has authored over 60 publications spanning art, science, and space systems.

Dr. Cyprien VERSEUX

SPEAKER

Dr. Cyprien Verseux is the head of the ZARM's Laboratory of Applied Space Microbiology, which develops biology-based technologies in support of future crewed missions beyond Earth. He currently leads the ERC project MarCyano and the "Sustainable bioproduction on Mars" project (part of the University of Bremen's Humans on Mars Initiative).

Dr. Ann-Kathrin VLACIL

SPEAKER

Ann-Kathrin Vlacil is the Human Exploration Enabling Science Team Lead located at the European Astronaut Centre (EAC) in Cologne, Germany. Her team manages ESA's cross-cutting human spaceflight enabling scientific activities in support of all destinations (LEO, moon and mars). In her previous role within ESA's Space Medicine Team she led a taskforce focusing on in-flight data analysis, risk identification, and potential mitigation strategies and supported in-orbit activities as an Operational Engineer. She holds a PhD in Cardiovascular Biology, a Master's degree in Space
Mission Science, Design and Application, a Master's degree in Biomedical Science and a Bachelor's degree in Molecular Biology.

Prof. Siegfried VLAEMINCK

SPEAKER

Siegfried Vlaeminck is a full professor at the University of Antwerp, a proud member of the Memorandum of Understanding (MoU) of MELiSSA, the Micro-Ecological Life Support System Alternative developed by the European Space Agency (ESA). He leads the Microbial Cleantech & Environmental Systems Analysis Team and serves as the spokesperson for the Biobased Sustainability Engineering (SUSTAIN) Research Group. Within the Centre for Advanced Process Technology for Urban Resource Recovery (CAPTURE), he is the academic lead of the pipeline on sustainable water treatment. Prof. Vlaeminck holds an MSc (2005) and PhD (2009) in Bioscience Engineering, with a focus on Environmental Technology, from Ghent University, where he was supervised by Prof. Willy Verstraete, one of MELiSSA's founding fathers. His research focuses on sustainable, microbe-driven technologies for water purification, nutrient management, and alternative food production. As a prime example of circular economy and sustainable production and consumption, his team also develops regenerative life support systems for long-duration space missions in the MELiSSA framework. Their work includes pioneering research on urine treatment and nitrogen conversion, with a particular emphasis on nitrification-based processes to recover fertilisers, produce clean water, and generate nitrogen gas for spacecraft atmospheric control.

Vincent VRAKKING

SPEAKER

Vincent Vrakking has a Masters degree in aerospace engineering from the Technical University of Delft in the Netherlands. He has been working on controlled environment agriculture and bio-regenerative life support systems at the German Aerospace Center's Institute of Space Systems since 2015. He worked as a subsystem engineer on the EDEN ISS project, helping to design and build a semi-closed plant cultivation system, the Mobile Test Facility, and test it in the space analog environment of Antarctica. Currently, he is the lead system engineer for the EDEN LUNA project, which will build on the EDEN ISS heritage to bring an upgraded Mobile Test Facility to the LUNA analog facility in Cologne, Germany.

Laia VULART

SPEAKER

Laia Vulart is a doctoral researcher at Universitat Autònoma de Barcelona and Ghent University, with an interest in bio-engineering and biotechnological processes. Her PhD work focuses on advancing sustainable resource recovery technologies for long-term space missions under the European Space Agency's MELiSSA Project. Her research explores thermophilic mixed-culture fermentation and bioelectrochemical systems, leveraging biotechnology to transform waste streams into valuable resources. Her work not only addresses the challenges of closed-loop life-support systems for space exploration but also contributes to advancing circular bioeconomy solutions on Earth, promoting more efficient and sustainable resource management across diverse environments.

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Michaela WALSH
SPEAKER

Michaela Walsh is a PhD researcher in University College Dublin (UCD) working in collaboration with St. Luke's Radiation Oncology Network, Ireland, leading research into the radiosensitivity of mammalian gut bacterial species. She graduated top of her class in the MSc programme in Medical Physics in UCD 2024, and is continuing the work she began in her master's thesis in her PhD.

Prof. David WEISSBRODT
SPEAKER

Prof. David Weissbrodt is a full professor at the Department of Biotechnology and Food Science, and incoming head of the Department of Biology, at the Norwegian University of Science and Technology (NTNU). David is an integrated environmental biotechnologist, scientist and educator driven by challenges at the water line in open and closed systems from terrestrial to space environments. David's curiosity about biological processes inspires the development of nature-based solutions to preserve natural resources, water, food and health. Recognizing water as a vital connector, David extends his scientific curiosity and expertise on microbial processes for (waste)water treatment, resource recovery and biorefinery to other biological systems such as recirculating aquaculture and hydroponic cultivation. Across these applications, the integration of physical, chemical and biological principles with mathematical modelling enables effective knowledge implementation. The production of edible leafy greens and higher plants on source-separated human residues like urine is a specific interest, motivated by collaborations with NTNU students and colleagues, research partners and the industry. David leads the PHYTONUR project, recently selected by the POMP4 program of the MELiSSA Foundation, in close collaboration with Kaia Macleod, UNINA, CIRiS, the MELiSSA Pilot Plant, and the broader MELiSSA community. The project aims to address and overcome plant stress under nutrient and salt imbalances. A core objective of David's work is to translate scientific findings into responsible innovations, practical solutions, policy contributions, and engagement initiatives involving knowledge users and the public to advance sustainability.

Dr. Heather WRAY
KEY SPEAKER

Dr. Heather Wray is a senior scientist at TNO, specializing in waste valorization, resource efficiency and circularity by design. With a background in environmental engineering, her research explores closing resource loops to facilitate the energy and materials transition. Heather has also been a pioneer in urban agriculture, developing Toronto's first rooftop vegetable garden. Her work increasingly examines the social dimensions of circular design, including impacts on wellbeing and resilience.

Solène WURTZ PRA

SPEAKER

Solène Wurtz Pra is a French mechanical engineer with a specialization in materials. A graduate of ISAESupméca, she has developed strong technical expertise in CAD design, finite element analysis, and fluid mechanics through internships at ArianeGroup, the German Aerospace Center (DLR), and the Centre Spatial Universitaire de Montpellier. Her experience includes structural modeling of composite materials, system integration for hydroponic plant growth in space habitats, and experimental design. She is also an alumna of the International Space University, where she deepened her knowledge in human spaceflight, space medicine, and system engineering for extraterrestrial agriculture. With a background that bridges engineering and humanitarian engagement, Solène is driven by a passion for innovation, teamwork, and service—qualities that she brings to both aerospace projects and community initiatives.

Izabela ŚWICA

SPEAKER

Mgr inż. Izabela Świca is a PhD student working on innovative methods to support plant growth under extreme environmental conditions, including in an environment that simulates the surface (regolith) of the Moon and Mars. She completed a six-month internship under the supervision of dr. ir. Wieger Wamelink at Wageningen University & Research, where she conducted a pot experiment implementing her own methods of fertilising and beneficiation lunar and Martian regolith simulants. Her research focuses on the use of microalgae and cyanobacteria as alternative fertiliser sources in the context of space agriculture, taking into account the principles of sustainable development and the ISRU (In-Situ Resource Utilisation) strategy. She has experience in optimising the cultivation of cyanobacteria and microalgae in various environmental conditions, including the use of municipal and industrial wastewater. In 2024, she was a finalist in the Direction:Space competition with the SymbioCube project. The device is a bioreactor for the symbiotic production of microalgae and fungi under microgravity conditions (ISS). She also completed training at the Analog Astronaut Training Center (AATC) and is a member of the Polish Astrobiological Society (PTA). She also worked on the project "Regolith extraction from the lunar surface in low gravity conditions," where she worked on magnetic separation to enrich lunar simulants for plant cultivation (consortium: CBK PAN in Warsaw and AGH in Kraków).

The content of the presentations was provided by the Key speakers and Speakers.

COLASSE SA

Lighting the Future, on Earth and Beyond

When Manuel Colasse founded Colasse SA in 2006, he was driven by a visionary belief: the future belonged to LED technology. An industrial engineer and entrepreneur at heart, he realized earlier than most that light is not only about visibility, but also a driver of performance, comfort, and sustainable innovation. Almost twenty years later, Colasse SA has become a recognized leader in LED lighting, in Belgium and internationally, serving more than 650 clients across Europe, the United States, and Canada.

A SCIENTIFIC DNA SERVING RESEARCH AND INNOVATION

Colasse SA stands out for its unique approach: combining technological expertise with a strong scientific mindset. The company does not simply manufacture equipment – it designs, experiments, and adapts tailor-made solutions. Colasse SA works closely with research centers, universities, and institutes, particularly on topics directly connected to the MELiSSA Project:

- optimizing light spectra for plant growth in greenhouses and laboratories,
- studying the impact of lighting on visual comfort and workplace safety,
- applied research on animal vision and sensitive environments.

Like the MELiSSA Project, Colasse SA explores how technology can help address global challenges: producing more efficiently, consuming less, and preserving resources.

SOLUTIONS THAT TRANSFORM ENVIRONMENTS

Colasse SA's expertise covers a wide range of sectors:

- Industry and logistics, with solutions for production halls, cranes, handling equipment, and LED display systems ensuring safety and efficiency.
- Healthcare and well-being, with lighting designed for hospitals and nursing homes, providing a comfortable and supportive environment for patients and staff.
- Culture and the arts, where Colasse SA enhances exhibitions and theaters with lighting that respects artworks while enriching the visitor experience.
- Horticulture, through its brand Vegeled™, dedicated since 2008 to optimizing LED horticultural lighting for agricultural research, seed producers, and growers.
- Animal well-being, a field where Colasse SA has developed specialized expertise, designing lighting adapted to the needs of diverse species such as insects, fish, livestock, and zoo animals.

Every project is a tailor-made response: audits, technical studies, design, manufacturing, installation, and follow-up. This integrated approach ensures results that are sustainable, measurable, and adaptable over time.

SUSTAINABILITY BY CONVICTION, NOT AS A TREND

From the outset, Colasse SA has placed sustainability at the heart of its mission. The company has relocated part of its production back to Belgium, reduces transport emissions by prioritizing rail and maritime over air freight, and uses responsible packaging that is recycled and recyclable.

At its Seraing site, a former industrial wasteland has been transformed into a living laboratory of biodiversity: a shared vegetable garden, beehives, vineyards, fruit trees, herbs, and flowering meadows coexist in a pesticide-free ecosystem.

This initiative goes far beyond symbolism. Colasse SA has turned the site into a platform for applied research: studying the productivity of native black bees, analyzing the migration of pollutants into wax and honey, and observing interactions between plants and insects. By combining scientific rigor with ecological responsibility, the company demonstrates its belief that technological innovation must go hand in hand with the preservation of ecosystems.

ON THE PATH TO B CORP CERTIFICATION

Colasse SA is also committed to becoming B Corp certified, an internationally recognized label for companies that combine economic performance with positive social and environmental impact. This demanding process strengthens the company's practices in five key areas: governance, employees, community, environment, and customers. It reflects Colasse SA's ambition to embody a business model where growth and responsibility move forward together.

A HUMAN AND PASSIONATE TEAM

Beyond its technology, Colasse SA is above all a team. A people-centered SME where every employee plays a full role in the company's projects. Well-being at work, trust, and continuous learning are the pillars of its success. The company regularly welcomes interns, collaborates with schools and universities, and participates in international programs such as EXPLORT (AWEX), reinforcing its role as a bridge between academic research and industrial innovation.

WHY MEET COLASSE SA AT MELISSA CONFERENCE?

Because Colasse SA reflects the very essence of the MELiSSA Project: a commitment to practical, sustainable solutions that improve life on Earth and open new perspectives for space exploration.

Manuel Colasse and Clémentine de Bournonville look forward to showing you how light can become a scientific and technological tool serving research, the planet, and human well-being. Their presence at the MELiSSA Conference is an invitation to engage with two committed representatives of Colasse SA, who share a vision where innovation and responsibility go hand in hand.

THALES ALENIA SPACE

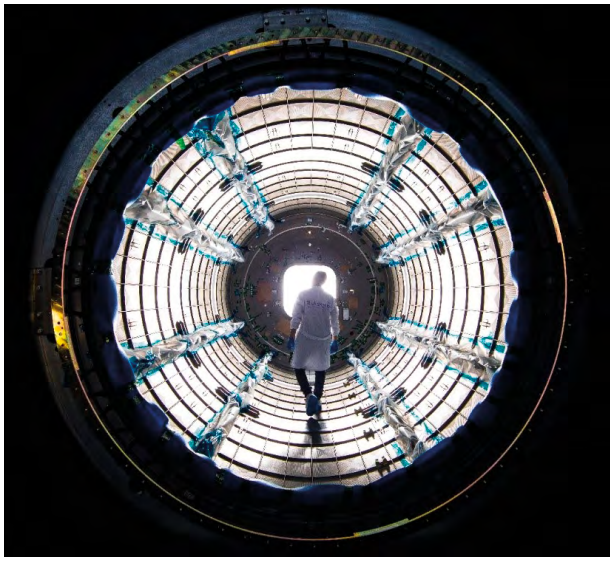
A Joint Venture between Thales (67%) and Leonardo (33%), Thales Alenia Space is a global space manufacturer delivering, for more than 40 years, high-tech solutions for telecommunications, navigation, earth observation, environmental management, exploration, science and orbital infrastructures. Thanks to our diversity of skills, talents and cultures, our customers (governments, institutions, space agencies, telecommunications operators) have Space to Connect, Secure & Defend, Observe & Protect, Explore, Travel & Navigate. We team up with Telespazio to form the Space Alliance, which offers a complete range of solutions including services.
Thales Alenia Space believes in space as humankind's new horizon, which will enable to build a better, more sustainable life on Earth.

LIVING & WORKING OFF EARTH.

The International Space Station holds a special place in the hearts of Thales Alenia Space engineers based in Turin, Italy. Thales Alenia Space has in fact supplied half of the pressurized volume on the ISS, including Nodes 2 and 3, the Permanent Multipurpose Module, the 3 Multipurpose Logistics Modules, the Cupola and the Columbus lab structure, along with ATV resupply vessels and the structure for the Bishop commercial airlock. In addition, Thales Alenia Space supplies pressurized cargo modules for the Cygnus resupply vessels. We are also building for Axiom Space pressurized elements of their future commercial space station in Low Earth Orbit.

Thales Alenia Space is now developing key modules dedicated to the Gateway cislunar space station, such as the I-HAB module and Lunar View as prime contractor of ESA and HALO's pressurized module for Northrop Grumman. The Lunar Gateway is at the heart of NASA's ARTEMIS program to bring astronauts back to the Moon in the years to come. Thales Alenia Space is also a major partner onboard Orion, NASA's human transportation vehicle for deep space exploration, providing thermomechanical systems for Orion's European Service Module.

For these elements we provide Environmental Control, Life Support and Thermal Control solutions ensuring habitability, comfort and safety for the astronauts. We are fully engaged in regenerative Life support technology developments and in the MELiSSA program, to ensure greater sustainability in future exploration missions.



ENGINSOFT

EnginSoft is one of the leading technology transfer companies in the field of Simulation Based Engineering Science (SBES). Since its foundation in 1984, through our expansion in the sector in the mid-Seventies, to the present day with a global presence, EnginSoft has always been at the forefront of technological innovation.

We are present in Italy, France, Germany, the UK, Türkiye and the U.S.A. and have a close partnership with synergetic companies located in Greece, Spain, Israel, Portugal, Brazil, Japan, Korea and the U.S.A.

We are unique in our field simultaneously having specific and advanced skills in all disciplines in which simulation technologies are utilized, combined with the vital complementary statistical approaches, scientific computing know-how and simulation process and data management (SPDM) knowledge and experience to assist customers to safely and effectively navigate, exploit and manage the vast and complex data and information obtained both from SBES applications and from direct physical testing.

Our knowledge and experience enables us to guide and assist customers with the process of digital transformation by identifying and resolving all the problems concerning the integration of simulation with other digital technologies, from the conception of a product, to its design and production – including plant planning and commissioning – right down to operations, across every industrial sector and business dimension, and fully consistent with the relevant development projects and investment plans.

We work across a broad range of industries that includes automotive, energy, oil and gas, aerospace and defense, civil and structural engineering, metals, machining and manufacturing, consumer goods and appliances, healthcare and biomechanics, helping customers to best leverage existing legacy and emerging simulation technologies.

EnginSoft is a member of the MELiSSA consortium by more than 15 years: this long-standing collaboration with ESA has improved its experience in the space industry.

In particular, EnginSoft know-how is focused on life support systems with specific reference to:

- Engineering of gas and liquid loops. This implies the design, supplier selection, procurement and assembly of the necessary components.
- Model development and simulation of processes, with integration of control systems, to generate a digital twin of the system. This virtual tool facilitates the analysis, improvement and optimization of the selection, assembly and operability of suitable technologie.
- Software development, GUI and customized solutions through Python and C++ programming and scripting to speed up any tool usability for the end user

SENER AEROESPACIAL

SENER Aeroespacial is a Spanish engineering company within the SENER Group that focuses on advanced technology development in space, defense, and scientific sectors. With more than 50 years of experience, the company has earned a strong reputation for delivering high-performance, reliable solutions.

In the space sector, SENER designs and manufactures key components for satellites, such as electromechanical systems, antennas, and optics. It collaborates with major international space agencies like ESA, NASA, and JAXA, contributing to missions such as JUICE, Solar Orbiter, and Proba-3. The company also supplies equipment for astronomy and scientific facilities, including mirror cells and robotic arms for advanced telescopes.

In defense, SENER develops electromechanical systems for guided missiles and platforms, including actuators and stabilization devices. It also provides intelligence and communication systems such as COMINT, RF technologies, and secure data links for land, sea, air, and space operations. The company is involved in aircraft modernization efforts and creates autonomous navigation systems for unmanned and tactical platforms.

SENER Aeroespacial has also significant expertise in developing technologies for microgravity environments, particularly through collaborations with the European Space Agency (ESA). One of its most notable contributions is MARES (Muscle Atrophy Research and Exercise System), which is used aboard the International Space Station to study the effects of microgravity on human muscle function. SENER also developed FIXBOX, a plant growth experiment with safe chemical containment, and DEMPCOS, a microbial contamination detection system that helps ensure crew health on space missions. These projects underscore SENER's focus on safe, high-precision engineering in space bioscience.

In addition, SENER is an active contributor to the MELiSSA (Micro Ecological Life Support System Alternative) Pilot Plant, ESA's groundbreaking research facility at the Universitat Autònoma de Barcelona. MELiSSA aims to simulate a closed-loop ecosystem that recycles air, water, and organic waste into food and oxygen—essential for future long-duration missions to Mars or the Moon. The pilot plant includes bioreactors and uses laboratory animals as test subjects to evaluate system viability before human trials. SENER's role includes systems engineering, sensors, and control technologies, helping enable sustainable human life in extraterrestrial habitats.

SENER Aeroespacial serves a wide range of markets, including satellite communications, space exploration, defense programs, scientific research, and air traffic control. Its hallmark is exceptional reliability, a strong commitment to R&D, and strategic partnerships across Europe and beyond.

SHERPA ENGINEERING

Sherpa Engineering is a System Engineering Consulting Company specialized in the model-based system approach for the design and validation of complex systems in several industrial fields as automotive, aerospace, naval, defence, energy and power and agriculture. Our solutions cover optimal energy management, autonomous vehicles and driver assistance systems, as well as the system design of electrical, hydraulic and mechanical applications. Sherpa Engineering puts multi-criteria system modelling and simulation at the core of your engineering by promoting an object-process approach to master complexity, capitalize and improve resource reuse, and reduce system and project risks. Sherpa Engineering supports its industrial customers by modelling their system from several points of view (teleological, functional, technological) and by linking their requirements with the functional and structural architectures. Sherpa Engineering has built its expertise and experience on dynamic modelling, real-time simulation, control of dynamic systems at the intersection of automatic control and artificial intelligence, and functional validation of embedded systems at all stages of the life cycle.

SHERPA engineering

UNIVERSITY CLERMONT AUVERGNE

Clermont Auvergne University (UCA) is a higher education and research establishment, founded in 2017 through the merger of two former universities: Université Blaise Pascal (UBP) and Université d'Auvergne (UdA). It gathers 37 000 students in 350 different and multidisciplinary courses, and 35 research laboratories. Among them, Institut Pascal UMR CNRS 6602 (IP) gathers more than 400 persons (permanent staff, PhDs, contract staff) covering all engineering disciplines. The team "Chemical Engineering, Applied Thermodynamics and Biosystems" (GePEB – IP, previously up to 2011 LGCB UBP) brings together all the lecturer-researchers in Bioprocesses Engineering of UCA and is an early partner of the MELiSSA Project (since 1989). Central skills of GePEB – IP team are concerned with bioreactors modelling and simulation, using both physicochemical modelling of the physical rate controlling processes and physiological modelling. GePEB-IP has thus been involved in the study of all compartments of the MELiSSA loop and participated in the design of the MELiSSA Pilot Plant hosted at the University Autonoma de Barcelona. UCA is one of the 16 partners of the MELiSSA Project that have signed the Memorandum Of Understanding.

UNIVERSITÉ Clermont Auvergne

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