PROGRAM SPACE TRENDS

5th-6th December 2024

DAY 1	
9:30 Registration and morning cup of coffee	
10:00	Welcome to Space Trends Conference! Opening remarks: • PhD Eng. Paweł Stężycki, General Director of the Łukasiewicz – Institute of Aviation • PhD Michał Doligalski, IGF Poland, Director of the Department of Innovation and Development, Ministry of Science and Higher Education • PhD Eng. Maciej Zasuwa, Vice-Dean for Education, Faculty of MeiL, Warsaw University of Technology • Col. Marcin Mazur, Vice President of the Polish Space Agency
10:15	Introduction speech • **Green propulsion**: from AMBER Rocket to orbital operations PhD Eng. Adam Okniński, Director of Space Technologies Center (Łukasiewicz - Institute of Aviation)
10:30	**KEYNOTE SPEECH** Professor Michael Gozin (School of Chemistry, Tel Aviv University) "Janus-type Hypergolic Fuels for Hybrid Systems using H_2O_2 and HAN – based oxidizers"
11:00 Coffee break	
11:15	Panel Discussion 1 **Technical Challenges in the Development of Green Space Propulsion – Environmental Impact vs. Cost and Availability** *Moderator:* Kamil Sobczak - Head of Space Propulsion Department Łukasiewicz - Institute of Aviation *Panelists:* 1. Dr. Ing. Christoph Kirchberger - Head of Department Institute of Space Propulsion Satellite and Orbital Propulsion, German Aerospace Center – DLR Lampoldshausen

	2. Dr Mark Ford - Head of the Propulsion Engineering Section, European Space Agency 3. Prof. Niklas Wingborg - Project Manager, FMV
12:30	Busch Group – market insight: How vacuum technology enables progress in spaceflight (Jan-Hendrik Doerr, Market Manager R&D, Busch Group)
12:45 Lunch	
13:45	Panel Discussion 2 **Bringing New Space Propulsion to the Market** *Moderator:* Dr Jamila Mansouri - Head of Propulsion, Aerothermodynamics and Flight Vehicles Engineering Division, European Space Agency *Panelists:* TBD: 1. Andrew Clark - Head of Propulsion Products and Tanks, Airbus Defence and Space (online) 2. Błażej Marciniak - CEO, Thaliana Space 3. Derek Harris – Business Development Manager, Nammo Ireland 4. Ismael Gutierrez - Co-Founder & Director of Propulsion, Arkadia Space 5. Joe Hunter - Strategy, Marketing and Sales, Thales Alenia Space
15:00-17:00	LABORATORY TECHNICAL TOUR Discover Łukasiewicz - Institute of Aviation laboratories for space technologies including vacuum propulsion hotfire facility
20.00	Gala Dinner. Tribute to the late Prof Wolański

DAY 2

8:30 Registration and morning cup of coffee

09:00	**KEYNOTE SPEECH** Prof. Maurizio Natali (University of Perugia) "State-of-the-art of high temperature materials for rocket motors: a review"
09:30	TECHNICAL SESSION 1 Chairpersons: Dr Dirk Schneider, ESA Dr Łukasz Kapusta, Warsaw University of Technology **"Propulsion testing and modeling'** • Overview of Cryogenic Propulsion Components Tests at the DLR M3 Infrastructure – Justin Hardi (Head of the Rocket Propulsion Technology Department, German Aerospace Center (DLR)) • The commissioning of the high-altitude test facility for space rocket propulsion testing - Michał Zieliński (Engineer at Space Technology Center, Łukasiewicz - Institute of Aviation) • Challenges in developing students' remote test stand for rocket propulsion systems - Michał Kret (Member of Students' Space Association, Warsaw University of Technology) • Dynamics of E-pumps Developed for the RELIANCE Rocket Engine - Jiří Kozak (Project Manager, Inpraise Systems s.r.o.) • The influence of flash-boiling conditions on droplets from impinging-jet spray - Hernan Amaya (Warsaw University of Technology) • Effect of flash-boiling on spray-wall interaction under low-pressure injection - Rohit Thokala (Aerospace Engineer, Warsaw University of Technology) • Overview of Rocket Propulsion Test Activities at Łukasiewicz – Institute of Aviation in 2023-2024 - Tobiasz Mayer (Head of the Rocket Propulsion Test Section, Łukasiewicz - Institute of Aviation) • Throttleable Liquid Propulsion Demonstrator Simulation - Krzysztof Matysek (Simulation Engineer, Łukasiewicz - Institute of Aviation)

11:15 Coffee break

11:30	Panel Discussion 3 **Space Propulsion Beyond LEO – the next decades** *Moderator:* Dariusz Aksamit - Science Communicator, Medical Physicist, NGO Activist,

	Warsaw University of Technology *Panelists*: 1. Kate Underhill - FLPP Propulsion Engineer, European Space Agency 2. Dr Andrzej Piątkowski - Deputy Director Research and Innovation Department, Polish Space Agency 3. Dr Jiří Kozák, Project Manager, InPraise Systems
12:30	**"SOLID AND HYBRID PROPULSION"** Chairpersons: Dr Alexander Weigand, Bayern Chemie Dr Christopher Glaser, Research Fellow, German Aerospace Center (DLR) TECHNICAL SESSION 2 • Development of a ø610 mm solid rocket motor - Dariusz Sokołowski (Military Institute of Armament Technology) • 3D printing as a viable method of inhibiting solid propellant grains - Michał Tomporowski (Warsaw University of Technology) • Green Flip Control System – a hybrid propulsion solution for rotating a launcher's first stage - Adam Matusiewicz (Manager of the Experimental Rockets Department, SpaceForest) • Hybrid rocket motors' development in Students' Space Association - Bartosz Hyży (Warsaw University of Technology)
13:30 Lunch	
14:30 **KEYNOTE SPEECH** Leonard Dudziński, Chief Technologist, Planetary Science Division, NASA (online) "The status of Nuclear Propulsion, a critical technology for advancing human and robotic exploration of the solar system"	
15:00	**"GREEN PROPULSION"** Chairpersons: Kate Underhill (FLPP Propulsion Engineer, ESA) Prof. Niklas Wingborg (FMV) TECHNICAL SESSION 3 • Green Propellant Research at DLR Lampoldshausen – Dr. Ing. Christoph Kirchberger (Head of the Satellite and Orbital Propulsion Departament, German Aerospace Center (DLR))

	• Grace Development Programme: A green Engine for Future Spacecraft and Space Transportation – PhD Eng. Paweł Surmacz (Head of the Satellite Propulsion Section, Łukasiewicz – Institute of Aviation) • Engine control unit for a green microsatellite propulsion system – Konrad Wojciechowski (Systems Engineer, Łukasiewicz – Institute of Aviation) • Demonstration of deep throttling with green storable propellants – a step towards future flexible space propulsion – Dawid Cieśliński (Head of the Rocket Analysis and Test Section, Łukasiewicz - Institute of Aviation)
15.50	**”FUTURE PROPULSION SYSTEMS”** Chairpersons: Dr Agata Jóźwicka-Perlant, ESA Ewa Majewska, Łukasiewicz – Institute of Aviation TECHNICAL SESSION 4 • Detonative Propulsion Research at Łukasiewicz – Institute of Aviation - PhD Eng. Michał Kawalec (Head of the Space Propulsion Section, Łukasiewicz - Institute of Aviation) • Water Electrolysis Propulsion for Spacecraft: A Comprehensive Review and Status Assessment - Puneeth Bheesetty (Warsaw University of Technology) • Electric propulsion activities in IFPiLM - Maciej Jakubczak (Institute of Plasma Physics and Laser Microfusion)
16:30	Conference Conclusion and Best Presentation Award
17:00	End of the Event