

# PROGRAM SPACE TRENDS

5th-6th December 2024

<b>DAY 1</b>	
9:30 Registration and morning cup of coffee	
10:00	Welcome to Space Trends Conference! Opening remarks: <ul style="list-style-type: none"><li>• Łukasiewicz Research Network – Institute of Aviation</li><li>• Warsaw University of Technology</li><li>• Vice President of the Polish Space Agency, Col. Marcin Mazur</li></ul>
10:15	Introduction speech <ul style="list-style-type: none"><li>• <b>Green propulsion:</b> from AMBER Rocket to orbital operations Adam Okniński, Director of Space Technologies Center (Łukasiewicz - Institute of Aviation)</li></ul>
10:30	<b>KEYNOTE SPEECH</b> Michael Gozin (Tel Aviv University)  Janus-type Hypergolic Fuels for Hybrid Systems using H <sub>2</sub> O <sub>2</sub> and HAN – based oxidizers.
11:00 Coffee break	
11:15	Panel Discussion 1 <b>Technical Challenges in the Development of Green Space Propulsion – Environmental Impact vs. Cost and Availability</b>  <i>Moderator:</i> Kamil Sobczak - Head of Space Propulsion Department Łukasiewicz -Institute of Aviation  <i>Panelists:</i> <ol style="list-style-type: none"><li>1. Mark Ford - Head of the ESA's Propulsion Engineering Section, European Space Agency</li><li>2. Dr.-Ing. Christoph Kirchberger Head of Department Institute of Space Propulsion Satellite and Orbital Propulsion, German Aerospace Center - DLR</li><li>3. Niklas Wingborg Project Manager of Launch, FMV</li><li>4. LIFTERO</li></ol>

12:30	<p>Busch Group – market insight:</p> <p>How vacuum technology enables progress in spaceflight (Ingo Heitz; Jan-Hendrik Doerr)</p>
12:45 Lunch	
13:45	<p>Panel Discussion 2 <b>Bringing New Space Propulsion to the Market</b></p> <p><i>Moderator:</i> Jamila Mansouri - Head of Propulsion, Aerothermodynamics and Flight Vehicles Engineering Division, European Space Agency, ESA/ESTEC</p> <p><i>Panelists:</i> TBD:</p> <ol style="list-style-type: none"> <li>1. Blazej Marciniak - CEO, Thaliana Space</li> <li>2. (TBC) Thales Alenia Space</li> <li>3. Andrew Clark - Head of UK Strategy, Airbus Defence and Space</li> <li>4. Ismael Gutierrez - Co-Founder &amp; Director of Propulsion, Arkadia Space</li> </ol>
15:00-17:00	<p>LABORATORY TECHNICAL TOUR</p> <p>Discover the Łukasiewicz - Institute of Aviation Laboratories for space application including vacuum propulsion hotfire facility</p>
20.00	Gala Dinner. Tribute to the late Prof Wolanski

**DAY 2**

8:30 Registration and morning cup of coffee

09:00 **KEYNOTE SPEECH**

Maurizio Natali (University of Perugia)

„State-of-the-art of high temperature materials for rocket motors: a review”

09:30 Technical Session 1

**“Propulsion testing and modeling”**

- Overview of Cryogenic Propulsion Components Tests at the DLR M3 Infrastructure – Justin Hardi (German Aerospace Center (DLR))
- The commissioning of the high-altitude test facility for space rocket propulsion testing - Michał Zieliński (Łukasiewicz - Institute of Aviation)
- Challenges in developing students’ remote test stand for rocket propulsion systems - Michał Kret (Warsaw University of Technology)
- Dynamics of E-pumps Developed for the RELIANCE Rocket Engine - Jiří Kozak (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 (Warsaw University of Technology)
- Overview of Rocket Propulsion Test Activities at Łukasiewicz – Institute of Aviation in 2023-2024 - Tobiasz Mayer (Łukasiewicz - Institute of Aviation)
- Throttleable Liquid Propulsion Demonstrator Simulation - Krzysztof Matysek (Łukasiewicz - Institute of Aviation)

11:00 Coffee break

11:15 Panel Discussion 3

**Space Propulsion Beyond LEO – the next decades**

*Moderator:*

Adam Okniński - Director of the Space Technology Centre, Łukasiewicz – Institute of Aviation

*Panelists:*

1. Andrzej Piątkowski - Deputy Director Research and Innovation Department, POLSA
2. (TBC) Sébastien Reichstadt - Co-Founder & Propulsion System Lead, The Exploration Company
3. (TBC) prof. Mariusz Dąbrowski - Head of the Nuclear Power and Environmental Analysis Department, National Center for Nuclear Science

	<p>4. Kate Underhill - FLPP Propulsion Engineer, European Space Agency</p> <p>5. Christopher Glaser - Researcher, DLR</p>
12:15	<p><b>"SOLID AND HYBRID PROPULSION"</b></p> <p>TECHNICAL SESSION 2</p> <ul style="list-style-type: none"> <li>• Low smoke solid propellants based on GAP and ADN - Michał Chmielarek (Warsaw University of Technology)</li> <li>• Development of a ø610 mm solid rocket motor - Dariusz Sokołowski (Military Institute of Armament Technology)</li> <li>• 3D printing as a viable method of inhibiting solid propellant grains - Michał Tomporowski (Warsaw University of Technology)</li> <li>• Green Flip Control System – a hybrid propulsion solution for rotating a launcher’s first stage - Adam Matusiewicz (SpaceForest)</li> <li>• Hybrid rocket motors’ development in Students’ Space Association - Bartosz Hyży (Warsaw University of Technology)</li> </ul>
13:15 Lunch	
14:15	<p><b>"GREEN PROPULSION"</b></p> <p>TECHNICAL SESSION 3</p> <ul style="list-style-type: none"> <li>• Green Propellant Research at DLR Lampoldshausen – Christoph Kirchberger (German Aerospace Center (DLR))</li> <li>• Grace Development Programme: A green Engine for Future Spacecraft and Space Transportation – Paweł Surmacz (Łukasiewicz – Institute of Aviation)</li> <li>• Engine control unit for a green microsatellite propulsion system – Konrad Wojciechowski (Łukasiewicz – Institute of Aviation)</li> <li>• Demonstration of deep throttling with green storable propellants – a step towards future flexible space propulsion – Dawid Cieśliński (Łukasiewicz - Institute of Aviation)</li> </ul>
	<p><b>"FUTURE PROPULSION SYSTEMS"</b></p> <p>TECHNICAL SESSION 4</p> <ul style="list-style-type: none"> <li>• Detonative Propulsion Research - Michał Kawalec (Łukasiewicz - Institute of Aviation)</li> <li>• Water Electrolysis Propulsion for Spacecraft: A Comprehensive Review and Status Assessment - Puneeth Bheesetty (Warsaw University of Technology)</li> <li>• Electric propulsion activities in IFPiLM - Maciej Jakubczak (Institute of Plasma Physics and Laser Microfusion)</li> </ul>

16:00	Conference Conclusion and Conference Awards
16:30	End of the Event