



## PRESS RELEASE

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For immediate release

### **Industry and Academic Leaders Explore How Engineering Innovation Is Powering the Next Era of Space Science at the 46th COSPAR Scientific Assembly**

Leading voices from across the aerospace industry and academia gathered in Florence, Italy for the panel titled "Engineering Innovation Enabling Scientific Research," examining how advances in engineering are unlocking new scientific missions and how ambitious science goals are, in turn, driving engineering breakthroughs.

The panel, moderated by Alison Nordt, Director of Space Sciences & Instrumentation at Lockheed Martin Space's Advanced Technology Center, brought together six panellists to discuss the evolving relationship between space science and systems engineering: Marius Anger (Aalto University), Jon Arenberg (Northrop Grumman), Mayra Montrose (L3Harris), Giampiero Di Paolo (Thales Alenia Space Italia), Steve Squyres (Blue Origin) and Eric Stallmer (Voyager).

#### **A New Era of Access and Opportunity**

Panellists agreed that the rapid growth of smaller, more accessible missions is opening doors for students and early-career researchers to gain direct, hands-on experience across the full mission lifecycle — experience that the group described as essential to building the next generation of space scientists and engineers. They called for stronger, more formal partnerships between universities, industry, and government agencies to ensure emerging talent is trained not only in scientific principles but in the practical realities of modern systems engineering.

#### **Navigating Risk in a Democratised Space Industry**

The discussion also addressed the risks inherent to space missions and the importance of building teams that pair strong technical talent with deliberate pipelines for training early-career professionals — a priority the panel said is especially critical for complex, multi-year projects. Panellists characterised the space sector as being on the cusp of a broader revolution driven by the "democratisation of space," marked by a growing number of participants not just from space agencies, but from universities, regional groups and private companies, and by new products, services, and mission architectures that are making previously unanswerable scientific questions accessible.

At the same time, the group cautioned that this democratisation carries risk if funders and the public do not understand the differences between systems and mission types — a challenge they said can be mitigated through sustained public communication, citing the James Webb Space Telescope team's outreach as a model.



## Emerging Technologies Driving the Field Forward

Panellists highlighted a wave of commercial capabilities reshaping the mission landscape, including frequent, lower-cost launch opportunities for payloads of nearly any size, missions capable of delivering tons of payload to the lunar surface, and the emergence of commercial space stations in low Earth orbit.

The discussion also turned to how technologies developed for large flagship missions are increasingly finding their way into smaller-scale and CubeSat missions. Panellists pointed to the Habitable Worlds Observatory as a key example, noting its need for more than a dozen new technologies – including high-stability, low-vibration platforms, advanced UV optic coatings, picometer-level metrology and actuators, new detector technology, deformable micro-mirrors, and high-contrast coronagraph instruments – many of which have strong potential for broader use in smaller missions.

Panellists further noted the growing role of artificial intelligence and machine learning in expanding onboard science processing and ground-based post-processing capabilities, enabling new correlations across data sets and deeper scientific insight. They also discussed the rise of photonics and photonic integrated circuits as instruments in their own right, describing the possibility, for some science missions, to replace traditional 3D telescope architectures with small 2D instruments capable of interferometric imaging, spectroscopy, and polarimetry – an approach offering significant improvements in size, weight, power, and cost, and enabling rapid production of instrument constellations for applications such as space weather observation.

## Looking Ahead

The panel closed on an optimistic note, with participants agreeing that a creative and open approach to this period of transformation holds the promise of a renaissance in space science for the benefit of humanity.

For the full scientific programme of the COSPAR Scientific Assembly, go to: [www.cospar-assembly.org/admin/congress.php?congress=13](http://www.cospar-assembly.org/admin/congress.php?congress=13)

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## About COSPAR

The Committee on Space Research (COSPAR) is an international scientific organization established in 1958, under the International Science Council (ISC). Its mission is to promote cooperation in space research, with an emphasis on the exchange of scientific results, information, and the development of global partnerships across disciplines for the benefit of all.

Through its scientific Commissions, Panels and Task Groups, COSPAR covers a wide range of space science fields, including Earth observation, planetary protection, astrophysics, and space life sciences and is a



trusted advisor to the United Nations on critical issues in space research. It plays a key role in fostering collaboration between the global scientific community, space agencies, industry, and emerging space nations. Through specialized capacity building workshops, it supports the growth of space science expertise worldwide. Its biennial event, the COSPAR Scientific Assembly, brings together thousands of researchers from around the world, serving as a major platform for knowledge exchange and international dialogue.

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