CEAS
Council of European Aerospace Societies

AEROSPACE EUROPE BULLETIN



- Announcing the first CEAS IASDM Conference; International Conference on Aerospace Structures, Structural Dynamics, and Materials in Rome, I taly on June 21–23, 2027
- Women in Aerospace Europe – Building the network that builds the sector
- A look back at the Aeroacoustics conference 2026: Sharing research for quieter flight

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CEAS

The Council of European Aerospace Societies (CEAS) is an International Non-Profit Organisation, with the aim to develop a framework within which the major European Aerospace Societies can work together.
It was established as a legal entity conferred under Belgium Law on 1st of January 2007. The creation of this Council was the result of a slow evolution of the 'Confederation' of European Aerospace Societies which was born fifteen years earlier, in 1992, with three nations only at that time: France, Germany and the UK.

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AEROSPACE EUROPE Bulletin

The **AEROSPACE EUROPE Bulletin** is a quarterly bulletin that aims to provide in depth information about the progress of European aerospace from every perspective.

We always welcome contributions from others parties such as decisions makers, scientist, engineers and students.

Write us at bulletin@ceas.org

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EDITORIAL

Dear readers,

Over the summer we had the opportunity to catch up with colleagues at gatherings across Europe. We had the pleasure of seeing the 32nd AIAA/CEAS Aeroacoustics Conference in Brussels organised by the VKI von Karman Institute for Fluid Dynamics together with our partners from the AIAA as well as the 21st IFASD conference, International Forum on Aeroelasticity and Structural Dynamics conference in Goettingen, Germany.

Common throughout was the sense that we are standing on the threshold of a new era, with technologies on display that have in them the promise to shape the aerospace industry for decades to come. In this issue, we explore some of these developments. Among the highlights are a new hydrogen-powered aircraft concept from students at TU Berlin and a rotating detonation rocket engine developed by students at ETH Zurich.
We also look ahead to the forthcoming newly developed IASDM conference with an interview with Prof. Carrera that surely will be a breath of fresh air for European Aerospace Structures and Material research, as well as hear his vision for the new Technical Committee that bears the same name.

Lastly, we are very proud to introduce our new partnership with Women in Aerospace. Women have long been the driving force for innovation and growth within the industry and it is only right that this is recognized through our new cooperation. We look forward to growing together and organising new initiatives that strengthen our bonds. Through friendships to new heights.

We wish you great reading pleasure,





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Interview with Prof. Erasmo Carrera

The IASDM Conference 2027: Bringing the aerospace structures and materials community together

30/10/2026

The new IASDM conference on Aerospace Structures, Structural Dynamics, and Materials in Rome is the first conference of its kind under the wings of CEAS and hosted by AIDAA. We spoke with Prof. Erasmo Carrera about the origins of the initiative, the decision to create an independent international event, and the role that CEAS and Europe can play in connecting the community.



Prof; Erasmo Carrera
President of A.I.D.A.A

Dear Prof. Carrera, thank you for taking the time to talk to us. Could you tell us where does the story of this new conference began?

It goes all the way back to the SDM conferences that ran all the way from the 1960s until 2013. What was nice at that time was that people had a strong will to work together. It was a conference organised by AIAA, ASME the American Society of Mechanical Engineers), ASCE the American Society of Civil Engineers, AHS the American Helicopter Society and ASC the American Society for Composites. All the societies working on structures, materials, and dynamics were together.

Many Europeans went to the conference. This was really a reference event for them on this topic. The most well-known experts in the field were taking part in the event with hundreds of attendees. However, after the 54th edition in 2013. AIAA decided to integrate the conference with their other big conference, SciTech; the same did ASME with IMECE.
This large conference that covers a broad range of topics made the environment less suited for just aerospace structures and materials experts.

So how did you go about bringing that kind of conference back?

I myself with a significant numbers of US colleagues went to several societies like the AIAA, ASME and they declined to host such a conference. Then COVID came. Afterwards, we went back to AIAA and ASME. Then ASME opened a door and said, "Yes, why not? Let's start this conference."
And so we held four editions of the conference with a slightly different name, SSDM, because of copyrights and so on. The first was in San Diego in 2023, then Seattle in 2024, Houston in 2025, and Long Beach in 2026. I was the chairman of the last edition with more than 300 attendees.

After this, ASME decided to mix the event with other ASME events, and so we decided to make it an independent international conference instead. "Who is going to host it?" Italy and Rome are always a good place to hold a conference and attract people. It was proposed to AIDAA to take care of the logistics. The new event was named IASDM by simply adding the 'I' as 'International'. That has motivated us to involve the CEAS leadership. I asked CEAS to create a Structures, Dynamics and Materials branch, and now it is going to be a CEAS event, this time organised by AIDAA.

Of course, CEAS leaders all agreed, and so we are starting now a very significant event for the worldwide aerospace community. We are working hard to make this first edition successful by next June. All the people who were involved in this event agreed to come on this journey..

What gap do you want the conference to fill?

If you go to other topics, such as hypersonics, fluid dynamics, aeroacoustics, aeroelasticity, and many others, we do have international events. Not on aerospace structures, dynamics, and materials. In the past, it was the SDM.
CEAS has taken the lead to create a place where scientists working on aerospace structures and materials will have a place to discuss all together. And this place is IASDM.

Now, with CEAS ahead, I am sure we can really increase the number of participants from Europe. I'm sure scientists from the USA, China, India, and South America will join as well.

What are your hopes for the first edition?

We hope we can have 200-300 people. We hope for more. It depends on the work we will do in the next few months. Of course, there will be strong involvement from AIDAA who has established a very important local liaison committee We hope to involve as many scientists as possible from other parts of the world under the CEAS leadership.

What role can Europe and CEAS play in connecting the community?

Europe, through CEAS, can have a role in connecting people internationally. At the moment, the US, due to geopolitical issues, is not able to make this happen, and other countries also have difficulties. So it is a good sign that Europe can try to do it.

This is very important for us as CEAS, because we really want to have scientists working together. We do not look for any financial benefits from IASDM. We just want to have a successful event.



Women in Aerospace Europe – Building the network that builds the sector

COFFEE CHATS OR COMPETITIVE EDGE — why informal networks are part of Aerospace's operating system

Aerospace is a complex business. Engineers, scientists, operators, policymakers, investors and business leaders all work on different parts of the same system. Getting those people to exchange ideas and experience is essential.

Companies have invested heavily in collaboration tools, knowledge management and internal networks. Yet formal structures can only go so far. Hierarchies, organisational boundaries and simply not knowing who to call can all get in the way of sharing knowledge. This is where professional networks have a role to play.

They create connections that sit outside the formal organisation. Sometimes that connection starts with a coffee. Sometimes it starts at a conference, a mentoring session or a Regional Network event. And sometimes a conversation that seems informal at the time turns into something much more concrete months later.

We see this regularly at Women In Aerospace Europe.

Today, WIA-Europe connects 23 Regional Networks across Europe, alongside 55+ corporate members, 20 +partners, 70+ volunteers and 1,500+ individual members. Through mentoring, professional development, outreach, research, grants, awards and industry events, those connections give people opportunities to learn from one another and to find people they might never otherwise have met.

A recent example is our partnership with the American Institute of Aeronautics and Astronautics (AIAA). Formalised in 2026, the partnership connects WIA-Europe's European community with AIAA's international network of aerospace professionals. It is a good example of how a relationship built within one network can lead to connections well beyond it. That is the part of networking that is easy to underestimate.

WHAT IS WIA-EUROPE?

Women In Aerospace Europe was founded in 2009 and has grown into a European professional network connecting people across the aerospace and space sectors. Our original mission was, and remains, to support women in aerospace and address the gender imbalance in the sector. But the way we do that has evolved. Today, WIA-Europe is an inclusive community that brings together women, men and allies who believe that greater diversity and stronger professional connections make the sector better.

The network now includes Regional Networks, covering communities across Europe, including Finland, Greece, Hungary, Italy, the Netherlands, the UK and many others. The strength of this model is that the Regional Networks are close to their local communities. They know the companies, universities and people in their ecosystem. At the same time, they are connected to a much larger European network. That combination of local knowledge and European reach is important.

PROFESSIONAL DEVELOPMENT

A large part of WIA-Europe's work is about helping people develop their careers. Across the network, members can take part in mentoring, career coaching, leadership discussions, negotiation workshops, company visits, technical and professional events and conversations with experienced people from different parts of the sector.
Mentoring is particularly valuable. One example is the WIA-Europe Toulouse-ENAC mentoring programme, which connected 24 engineering and master's students with WIA-Europe mentors. The idea is straightforward: give students access to people who have already made some of the transitions they are preparing to make themselves.
Those conversations can cover very practical questions: How do I find an internship? How do I move from university into industry? What does a particular career actually look like? When is it time to take the next step? These are questions that are not always answered in a classroom or an organisation chart.

VISIBILITY AND INSPIRATION

Professional networks also influence who gets seen. WIA-Europe creates opportunities for members to meet senior leaders, participate in panels, contribute to discussions and share their expertise. For younger professionals, seeing someone with a similar background in a senior technical or leadership position can make a career path feel much more tangible.

Our annual WIA-Europe Symposium has become an important part of this. The 2026 edition, Skills In Motion, was the fifth edition and brought together professionals, students, researchers and industry leaders to discuss skills, careers, innovation and the changing aerospace sector. But the value of an event is not limited to what happens on stage, It is often the conversation afterwards. The introduction over coffee, the person you meet because you happened to sit at the same table, the follow-up email a few days later. That is where networks become useful.

OUTREACH

The network also starts working before people enter the industry. Regional Networks organise activities with schools, universities and educational institutions. These can include STEM talks, panels, open days, competitions, mentoring activities and events where students can meet people working in aerospace. This matters particularly for girls and young women.

If you have never met a woman working as an engineer, researcher, programme manager or executive in aerospace, it can be difficult to imagine yourself in that role. Meeting someone who has taken that path can change the picture. Our work on STEM education has also looked at the factors that influence girls' interest in STEM and what can be done to encourage young women to stay in these fields.
The objective is long-term. The people we meet at school today may be the engineers, scientists and leaders joining the sector ten years from now.

GRANTS, AWARDS AND RECOGNITION

Networking is only one part of the picture. WIA-Europe also provides practical support through its Grants & Awards programme. In 2026, for example, the Student Conference Grant offered €1,000 to support a Bachelor's, Master's or PhD student attending an international workshop or conference and presenting aerospace research for the first time.

The Inspirational Award also offered €1,000 for a project aimed at promoting aerospace and inspiring future generations.

Our awards programme also recognises achievements through categories including the Outstanding Achievement Award, recognition matters. It can give someone visibility at a point in their career when being noticed can make a real difference.

KNOWLEDGE SHARING AND RESEARCH

WIA-Europe is also a place where members can contribute to discussions that go beyond their own organisations. Our working groups have produced white papers and research on subjects including STEM education, the aerospace skills gap, women in the C-suite, visibility of female talent and smart working.

This is one of the advantages of having a network that brings together people from different organisations and career stages. One company sees one part of the problem. A university sees another. An early-career professional may experience something quite different from a senior executive.
Bringing those perspectives together can reveal patterns that are difficult to see from inside a single organisation.

CAREERS AND TALENT

There is also a very practical side to the network. WIA-Europe members can find career opportunities, internships and information shared through the community. Corporate members can promote opportunities and engage with professionals across the network.
For companies, this creates another way of reaching talent. For individuals, it can mean hearing about an opportunity from a person rather than simply finding another vacancy online. That distinction matters..
People are often more willing to ask questions, seek advice or consider an opportunity when it comes through someone they know or someone they trust.

START-UPS AND THE CHANGING SECTOR

European aerospace is changing rapidly. Alongside established companies and institutions, there is now a much larger community of start-ups and SMEs.

WIA-Europe has responded with a Start-up Membership Programme, making it easier for emerging companies to participate in the network and gain visibility within the wider European community.
This is important because the talent flow is no longer simply between universities and large aerospace companies. People are moving between start-ups, established industry, research organisations, agencies and other parts of the ecosystem. Networks need to reflect that reality.

VOLUNTEERING

There is another part of WIA-Europe that is easy to overlook: the people who volunteer their time to make the network work. Regional Network leaders, working-group members, digital volunteers and event organisers contribute their time and expertise to the organisation.

For many volunteers, this is itself a professional-development opportunity. They learn to organise events, lead teams, communicate with different audiences and build relationships across organisations and countries.
In other words, people don't just participate in the network. They help build it.

23 REGIONAL NETWORKS — ONE EUROPEAN COMMUNITY

The Regional Networks are at the heart of WIA-Europe. There is something different about meeting people who work in your local aerospace ecosystem. You may see them again at another event, know their organisation or share connections with the same university or research centre.

But those local relationships are connected to something much bigger. Someone involved in a Regional Network in Finland can be part of the same wider organisation as someone in Greece, Toulouse, Madrid or Brussels. A student can meet a mentor locally and later attend a European event. A professional can discover a new contact in another country through a connection made at WIA-Europe.

This is why the number of Regional Networks matters — but the number alone is not the point.

The value is in the connections between them.

PARTNERSHIPS

The AIAA partnership is one example. In 2026, WIA-Europe and the American Institute of Aeronautics and Astronautics formalised their cooperation through a Memorandum of Understanding, creating a closer connection between the European WIA-Europe community and AIAA's international aerospace network. But our partnerships extend beyond AIAA.

WIA-Europe has also established cooperation with the Council of European Aerospace Societies (CEAS), strengthening links with the wider European aerospace professional community. Our partnership with Space Tech Expo Europe connects members to one of the sector's important industry and technology events, while our collaboration with the European Institute of Innovation for Sustainability (EIIS) brings an additional focus on education, innovation and sustainability.
Other relationships connect WIA-Europe with universities, research organisations and international institutions. These include TU Wien, through which WIA-Europe has offered a scholarship opportunity for the Executive MBA Space Architecture programme; Women in Copernicus, which works to promote gender equality and visibility in the Earth observation and geospatial sectors; and Eurisy, a European association that brings together space agencies, research institutions, industry and other stakeholders.

WIA-Europe has also engaged with the United Nations Office for Outer Space Affairs (UNOOSA) and the wider European research and education community, including organisations such as the European Commission, the Spanish National Research Council (CSIC) and TU Graz.

These partnerships serve different purposes. Some create opportunities for professional exchange. Others support education, research, visibility, events or access to new communities.

We don't need to duplicate what other organisations already do. We need to connect people who are doing different things and make it easier for them to find each other. That is where partnerships become valuable: they turn separate communities into a more connected aerospace ecosystem.

WHY THIS MATTERS NOW

The aerospace sector is dealing with a number of changes at the same time: new technologies, changing skills requirements, a growing space economy, new business models and competition for talent. No single organisation has all the answers.
Companies need access to skills, young professionals need experience and visibility, researchers need connections with industry, start-ups need people and partners, established organisations need to understand what is changing outside their own walls.

> **This is where professional networks can add real value.**

The network doesn't replace the company, the university or the institution. It connects them, and that is why I don't think we should dismiss networking as "just networking." A coffee chat can be just a coffee chat.

But it can also be the first conversation between a student and a mentor, between a company and a future employee, between two researchers from different countries, or between two professionals who later decide to work together. You never quite know which conversation will matter. That is the point.



LOOKING AHEAD

Our challenge at WIA-Europe is to keep making those connections useful.

That means continuing to strengthen our Regional Networks, supporting the next generation, developing mentoring and professional-development opportunities, creating visibility for talent, working with companies and partners, and building stronger connections across Europe and internationally.

So are the 23 Regional Networks, so are the mentors who give up their time, the volunteers who organise events, the companies that engage with members, the students who attend their first aerospace event and the professionals who make an introduction to someone they have never met before. These individual actions may seem small. together, they form infrastructure.

Human capital + social capital = real strategic capital.

So, professional associations: coffee chats or competitive edge?

At WIA-Europe, we think the answer lies somewhere in between. The coffee chat is where it starts; the network is what can happen next.

For more information

Visit WIA-Europe and follow our channels.

https://www.wia-europe.org

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Aeroacoustics 2026: Sharing research for quieter flight

The 32nd AIAA/CEAS Aeroacoustics Conference (Aeroacoustics 2026), which took place in Brussels on 26–29 May 2026, gathered 516 participants from over 30 countries. The premier international forum dedicated to aeroacoustics research and innovation, the conference was held in Belgium for the first time.

Organised by the von Karman Institute for Fluid Dynamics (VKI), Belgium, on behalf of the American Institute of Aeronautics and Astronautics (AIAA) and the Council of European Aerospace Societies (CEAS), the conference aimed to bring together researchers and engineers from academia, industry and government to exchange ideas, share recent findings, explore future research directions and inspire the next generation of scientists.



A broad technical programme

The technical programme featured 412 presentations spread over 89 sessions and included focused workshops, such as Hybrid Anechoic Wind Tunnels. Propeller, rotorcraft and wind turbine noise formed the largest topic area, with 89 presentations, followed by acoustics/fluid dynamics interactions (56) and jet aeroacoustics (44).

Other topics ranged from airframe/high-lift noise, duct acoustics, and turbomachinery and core noise to computational aeroacoustics, advanced testing techniques, reduced-order modelling and machine learning. Advanced air mobility and unmanned air systems featured alongside flight vehicle community noise, sonic boom and metrics. General acoustics, interior noise, structural acoustics and metamaterials, and UAS/UAM acoustic measurements and certification added further breadth.

Keynote highlights: from acoustic liners to eVTOL

The programme also featured four keynote lectures by leading scientists and technologists, as well as two award keynote lectures by the recipients of the AIAA and CEAS awards.

On the opening day, Prof. Francesco Avallone (Politecnico di Torino, Italy) delivered "Acoustic-flow interaction over acoustic liners". Avallone combines experimental and computational approaches to advance the physical understanding of noise generation mechanisms and develop noise-reduction technologies. The theme was also reflected in technical contributions on noise dissipation in multi-cavity liners and on how orifice shape affects acoustic attenuation under turbulent grazing flow.



On the second day, **Dr Daniel Edgington-Mitchell** (Monash University, Australia) delivered "What you're going to hear about aeroacoustic resonance may shock you". A specialist in resonance in compressible jets and co-director of Monash's Shock Lab, Edgington-Mitchell works across experimental techniques, data decomposition and linear modelling of tonal jet noise.

The third-day keynote, "Propeller Noise: Understanding and Prediction", was delivered by Dr Chaitanya Paruchuri (University of Southampton, UK). With 89 presentations devoted to propeller, rotorcraft and wind turbine noise, the keynote addressed the programme's most extensively represented topic area. Paruchuri also contributed a technical paper on the aeroacoustic characteristics of dynamic-transition propellers, linking the keynote theme with a specific research application.



Craig Mead (Vertical Aerospace, UK) completed the keynote programme on the final day with "Challenges in eVTOL aeroacoustics". With more than 30 years of experience in aeroacoustics and aircraft noise, and responsibility for Vertical Aerospace's acoustic activities in support of electric vertical take-off and landing aircraft, Mead brought an industry perspective. The technical programme also included "Airframe-Rotor Installation Effects for a Realistic eVTOL Configuration", a joint contribution from the University of Bristol and Vertical Aerospace.

Recognising achievement and supporting new talent

The two award keynote lectures were delivered by the 2026 CEAS Award recipient, Prof. Jan Delfs (DLR, Germany), on the second day, and the 2026 AIAA Award recipient, Dr Stephen Rizzi (NASA, US), on the third day.
Submissions received were evaluated by the Student Paper Committee, and the winner, Naia Suzuki (Monash University, Australia), was presented with an award on the final day in the plenary room.
Across the four days, the programme brought fundamental aeroacoustics, experimental and computational methods, and the noise challenges of emerging aircraft concepts into the same forum, alongside recognition of established researchers and new scientific talent.
The peer-reviewed proceedings were published by the AIAA and are available to all registered participants and sponsors through AIAA Aerospace Research Central..



On the picture from left to right: Roberto Camussi, CEAS ASC Vice Chair, Cornelia Hillenherms and Jan Delfs.



Stephen Rizzi AIAA Award Presentation

Maria Teresa Ramandi
and Prof. Christophe Schram

Announcing 11th CEAS AEROSPACE EUROPE CONFERENCE

29 NOVEMBER — 2 DECEMBER 2027 | AUGSBURG (Germany)

The CEAS Aerospace Europe Conference 2027 will take place from 29 November to 2 December 2027 in Augsburg, Germany. The event brings together experts from research, industry, and public institutions across Europe.



The conference serves as a central platform for scientific, technical, and professional exchange within the European aerospace community. It provides opportunities to present research results, showcase innovative projects, and discuss current developments and future challenges in aerospace.

Augsburg, one of Germany's oldest cities, is a dynamic centre of high-tech industry with a strong aerospace background. With more than 100 years of aviation history, the region has developed into an important hub for aircraft manufacturing and aerospace technologies. Today, leading industrial companies and research institutions are located here, particularly in the fields of aerostructures, lightweight design, and advanced production technologies.

Join us in Augsburg

Augsburg is one of Germany's key aerospace hubs, where advanced components for aircraft and spacecraft are designed and manufactured. The region is a centre of innovation in hydrogen technologies, lightweight construction, resource-efficient engineering, automation, and the use of artificial intelligence in production processes. **Around 25,000 people are currently employed in the aerospace sector in the region, contributing to numerous high-profile projects that continue to shape the industry.**

The ecosystem of stakeholders is broad and highly interconnected. On the industrial side, it includes companies such as MT Aerospace, Airbus Aerostructures, Airbus Helicopters, KUKA, Liebherr, SGL, and many others. Equally important is the strong research landscape, featuring institutions such as the Applied Materials and Environmental Research Center (AMU), the German Aerospace Center (DLR), the Fraunhofer Institute for Casting, Composite and Processing Technology (IGCV), the Institute for Materials Resource Management (MRM) at the University of Augsburg, and the Augsburg University of Applied Sciences.

Reflections on ILA BERLIN

By – Jonathan C Clare, RAeS Head of External Affairs.

The 2026 ILA Berlin trade show provided a convergence of autonomous systems, networked combat legacy architectures, AI and innovation. RAeS Head of External Affairs, **JONATHAN C CLARE** reports on Germany's leading aerospace and defence airshow.

Held at Berlin Brandenburg Airport (BER) from **10–14 June**, the ILA Berlin exhibition attracted more than 750 exhibitors from 37 countries, over 300 delegations from 60 countries and served as a focal point for government leaders, industry executives, defence organisations and research institutions. With more than 100 aircraft on display and more than 400 speakers participating, the year also marked the first time the Royal Aeronautical Society exhibited at the event. Representation was provided across the RAeS German Branch network, alongside a number of corporate and industry partners, including MBDA, Rolls-Royce, Safran, Rheinmetall, CAE, Emirates, Leonardo, Airbus, Lockheed Martin (Sikorsky), Northrop Grumman, General Electric, Honeywell and Eurofighter.
The political tone of the exhibition was set by German Chancellor, Friedrich Merz, who opened the show and unveiled Germany's new national aviation strategy. Merz described aerospace as "a key strategic sector" and argued that the industry safeguards "our ability to defend our country and our alliances."

He emphasised that competitiveness, innovation, security and sustainability should be pursued together, while positioning Germany and Europe as leading aerospace powers. Against a backdrop of heightened defence spending, supply-chain resilience concerns and increasing global competition, aerospace is now central to Europe's economic and security policy.

Crewed fighters and UCCAs

Eurofighter's Typhoon was one of the most prominent features in the ILA 2026 flying display. The aircraft is evolving with new sensors, connectivity, munitions and Electronic Warfare (EW) systems, as well as the ability to act as a command platform, alongside Uncrewed Collaborative Combat Aircraft (UCCA) systems into the 2060s. Eurofighter's manufacturing consortium of Airbus, BAE systems and Leonardo remains a central platform for European air deterrence, while contributing to the next-generation combat air systems.



Airbus Defence revealed its U760 Ravenstorm at the show. (Sam Leather/RAeS)

> Lockheed Martin's F-35A Lightning II was on a static display during the show. The aircraft will enter service in Germany in 2027.

Meanwhile, Airbus showcased an expansive UAS and UCCA portfolio, including the U145 uncrewed helicopter, the U760 Ravenstorm UCCA, the U740 Valkyrie, and the U950 Eurodrone. The U760 Ravenstorm will be capable of air-to-air, air-to-ground and EW missions by 2032.

Lt Gen Holger Neumann, Commander of the Luftwaffe, celebrating Luftwaffe's 70 years in "the modern era," indicated that the security environment in recent years had fundamentally shifted around air and space power with the need to integrate more uncrewed platforms and new air and missile defence capabilities. The Collaborative Combat Aircraft (CCA) market, for example, was projected to grow to over 1,000 by the end of 2036 (source Aviation Week) with the USAF being the main beneficiary. During the show Boeing revealed an upgraded iteration of its MQ-28. Australia for its part has moved forward with the MQ-28A Ghost Bat with Boeing Australia, and Boeing's autonomous CCA is tailored for the German Luftwaffe and features a 2,000lb payload boost.

Shaping future air power

Rather than being dominated by traditional fighter aircraft programmes, ILA's other themes highlighted advanced autonomous systems and drones, AI-enabled warfare, space-based intelligence and surveillance and sustainable aviation technologies. The event's theme 'Pioneering Aerospace' also marked a transition from discussion to implementation, indicating that Europe's aerospace sector has entered a new phase in which competitiveness, technological sovereignty and security are priorities across allied nations.

Airbus Defence and Space CEO, Michael Schöllhorn argued that aerospace is central to all of them and said: "This ILA comes at just the right time." The CDU mayor of Berlin, Kai Wegner, speaking about the defence technology boom surrounding ILA, said: "We are seeing interest from foreign companies and foreign investors" and highlighted the rapid expansion of the defence-technology sector.

Geopolitics and the threat environment



The General Atomics ASI Do228 NXT on static at ILA Berlin. (Sam Leather/RAeS)

If one theme defined ILA 2026, it was a desire to accelerate European defence in the face of the current threat environment and increasing pressure on European nations to strengthen their defence capabilities. Supreme Allied Commander Europe (SACEUR), General Alexus Grynkewich, speaking at the event, noted that Russian aggression does not reflect an imminent desire for direct conflict, but rather a need for NATO to remain vigilant and adaptable. "We need to focus on things that we can acquire quickly, that we can field quickly, and that we can scale rapidly and sustain over time, and that goes for long-range fires," as well as drones.

The conflicts in Ukraine and the Middle East have similarly focused attention on the protection of critical national infrastructure, including airports, and mitigating threats from uncrewed air systems with countermeasures and technologies. Aerospace was viewed by senior figures at ILA as a strategic priority underpinning economic resilience and national security. As Marie-Christine von Hahn, Chief Executive of the German Aerospace Industries Association (BDLI), observed during the event, ILA 2026 was "an ILA of new beginnings," characterised by a level of commercial engagement and industrial co-operation not seen for many years.

Integrated systems for airspace and power



Helsing unveiled a potential EW variant of its CA-1 Europa UCAV. (Sam Leather/RAeS)

Discussions throughout the event re-emphasised the need for integrated air defence, autonomous systems, counter-drone technologies and resilient industrial supply chains. Agreements announced at ILA involved AI-enabled sensing, autonomous decision support, unmanned systems integration or counter-UAS capabilities. The conference this year demonstrated a broader shift in European defence priorities towards digitally connected and increasingly autonomous operational concepts. Several major agreements addressed these priorities:

Airbus Defence and Space and Diehl Defence agreed to deepen co-operation on Integrated Air and Missile Defence (IAMD). Airbus Defence and Space also signed an agreement with Alta Ares to develop European counter-drone solutions, incorporating artificial intelligence.

Airbus Helicopters and Quantum Systems announced co-operation to integrate counter-UAS technologies onto military helicopter platforms, beginning with the H145M.

Rheinmetall, ERC System and the German state of North Rhine-Westphalia established a partnership to support production of the Victor U250 heavy-lift unmanned aircraft system.

HENSOLDT and SE3 Labs launched a strategic collaboration focused on spatial and agentic artificial intelligence. Helsing announced an electronic attack version of the CA-1 Europa CCA which is anticipated to be service-ready in 2031. The CA-1EA electronic attack demonstrator is expected to be operational in 2028.

Diehl Defence and Spire Global agreed to explore satellite-enabled intelligence and early-warning capabilities for ballistic and hypersonic missile threats. Diehl Defence also announced a mobile launcher for a ground-launched IRIS-T missile with advanced mobile firing weapons capability.

Kongsberg announced the completion of its acquisition of US missile manufacturer, Zone 5 Technologies. The company designs and manufactures mass-producible interceptors, including long-range strike and air defence missiles.

Civil aviation – sustainability and regional innovation



It is Lufthansa's centenary this year. (Sam Leather/RAeS)

Although defence dominated many discussions, sustainable aviation remained an important theme. The aerospace sector continues to invest in long-term sustainable aviation technologies, particularly in regional air transport and advanced propulsion. One of the headline announcements was a strategic agreement between Airbus and the Lufthansa Group to commemorate 50 years of partnership. The agreement includes support arrangements for Lufthansa's Airbus fleet while reaffirming both organisations' commitment to reducing aviation's environmental footprint. For its main civil aviation deliverables Airbus is currently aiming to build 75 A320 family aircraft per month by the end of 2026 which is now largely dependent on engines and other suppliers. Airbus officially signalled its intention to launch a A320neo successor aiming for entry into service between 2037-2038. By contrast, Boeing has delayed developing a 737 MAX replacement.

Another notable emerging technology announcement was progress by German electric aircraft developer, VÆRIDION. The company reported orders exceeding 100 aircraft for its Microliner electric regional aircraft in both passenger and cargo configurations. It also announced its first commercial collaboration with General Atomics Aeronautical Systems for airborne battery technology and confirmed completion of the aircraft-level Preliminary Design Review (PDR), a key milestone ahead of its planned first flight.

Innovative themes



Another UAV unveiled by Airbus at ILA Berlin - an uncrewed cargo version of its H145M helicopter. (Airbus Helicopters)

Autonomous and semi-autonomous air combat was the main technological feature at ILA. One of the largest additions this year was the new Drone Pavilion, featuring live demonstrations and MBDA's 'Swarm Drone Challenge' in which autonomous drone teams performed complex co-ordinated tasks, illustrating the growing military and civil importance of AI-enabled unmanned systems. Leading innovative start-ups from Ukraine featured prominently at the airshow.

Ukrainian drone maker, Skyfall signed an MoU with Airbus Defence and Space at the event to support the integration of Skyfall's interceptor drones into Airbus' integrated air and missile defence systems. German defence technology start-up, Stark displayed its Cascade loitering munition with a range of up to 62 miles. Johannes Schaback, CTO Stark, said: "forces need capabilities that can be produced quickly, adapted rapidly and fielded at scale."
Germany's Heron TP made its ILA flying display debut, transmitting live high-resolution imagery during flight demonstrations, while Airbus highlighted its "MARS Autonomy Stack" (Mission Autonomy and Teaming Intelligence) and a family of unmanned systems, including an uncrewed variant of its H145 twin engine light helicopter. The Airbus RACER flying demonstrator showcased its

innovation design, bridging the gap between helicopters and fixed-wing aircraft, while the Leonardo AW249 made its first international airshow appearance, displaying Europe's latest dedicated attack helicopter programme and how rotorcraft are evolving into highly connected battlefield nodes rather than standalone platforms.

German OEM, Deutsche Aircraft promoted the design of landing gear for the next-generation D328eco and legacy D328 turboprops and other innovations around integrated uncrewed capability and a fully integrated fuel-to-flight solution for a D328 Multi-Role Maritime Patrol Aircraft with announcements of other technological advancements and partnerships. "ILA Berlin 2026 demonstrated the strength of collaboration across the European aerospace ecosystem," said Nico Neumann, CEO Deutsche Aircraft.

The shadow of FCAS

The strategic backdrop to ILA 2026 was to some extent influenced by the recent collapse of the Franco-German-Spanish Future Combat Air System (FCAS) fighter aircraft programme. Just days before the exhibition opened, Germany and France confirmed that the long-running programme would no longer proceed in its original form. Chancellor Merz indicated that future Franco-German co-operation would focus on a broader "system of systems" approach, centred on combat cloud technologies and digital integration. The German government, alongside locally based industrial entities, signalled its intention to maintain a leading role in any future sixth-generation combat aviation programme. For many observers at ILA, the FCAS outcome reinforced the urgency of achieving practical co-operation in areas, such as air defence, space systems, sensors, autonomy and digital networks.

Space – strengthening European



The space zone was larger than ever. (Sam Leather/RAeS)

The space sector was seen as a vital domain for national and European security. Several announcements at ILA reinforced Europe's determination to maintain independent access to space and expand its orbital capabilities.
On the first day of the event leading representatives from ESA, including Director General, Josef Aschbacher and ESA astronauts and industry representatives highlighted the range of their activities from in-space operations, Earth observation, European Service Modules to space defence.

ESA astronaut, Samantha Cristoforetti delivered a keynote address at the German-Italian Aerospace Forum 2026, hosted by the Italian Embassy in Berlin. She used the high-profile platform to push for European strategic autonomy, specifically advocating for the advancement of European crewed launch capabilities and resilient, autonomous access to space.



Render of a notional 'sixth gen' fighter from the German industrial grouping Team Gen 6. (Airbus)

The German Aerospace Center (DLR) and ArianeGroup renewed a framework co-operation agreement, aligning research and development activities in launch systems and propulsion technologies. This partnership directly supports Europe's strategic objective of maintaining sovereign access to space.

DLR also signed an agreement with Starlab Space, reserving ten experimental payload locations aboard the planned commercial space station. The move positions German research organisations to maintain access to low-Earth orbit as the International Space Station moves to retirement.

Rheinmetall and ICEYE reported new space-based reconnaissance capabilities in Germany through a joint venture, Rheinmetall ICEYE Space Solutions GmbH. The primary objective would be to establish a long-term sovereign ISR platform.

Earth observation also featured prominently to provide environmental, climate and disaster-monitoring data for Europe and international users. Airbus has signed a contract with Thales Alenia Space on behalf of ESA. This agreement is for the development and production of two C-band radar instruments for the Sentinel-1 NG constellation which is part of the EU's Copernicus programme.
Another development was the signing of a joint declaration between the European Space Agency (ESA) and the European Commission on In-Space Operations and Services (ISOS). The declaration highlights Europe's ambition to become a global leader in on-orbit servicing, maintenance and infrastructure support.

Summary



The RAeS team on the stand at ILA Berlin. (Jonathan Clare/RAeS)

> ***ILA Berlin 2026 has been a turning point for European aerospace, demonstrating a sector responding to geopolitical dynamics and fast-moving technological change. Sustainability now sits alongside increasing European priorities over defence readiness, industrial resilience, sovereign access to space and technological independence.***

Throughout the conference discussion partnerships and collaboration were raised frequently. Whether focused on electric aircraft, missile defence, autonomous systems, launch technologies or orbital services, organisations increasingly recognise that no single company or nation can address future challenges alone. Despite the recent collapse of FCAS illustrating the challenges around multinational industrial co-operation, the hundreds of agreements and memoranda signed during the exhibition implied that collaboration remains strong throughout the sector.
However, the strongest message from both government and industry leaders was that Europe's aerospace future would most likely be defined by software, autonomy, UAS/drones and integrated combat networks rather than by crewed aircraft alone.

Jonathan C Clare
7 July 2026

For more information
please visit https://www.aerosociety.com/news/reflections-on-ila-berlin/

Farnborough International Airshow 2026 - Day Zero

ROYAL AERONAUTICAL SOCIETY

By – Tim Robinson FRAeS, Stephen Bridgewater FRAeS and Dominic Ward

Tim Robinson FRAeS, Stephen Bridgewater FRAeS and Dominic Ward provide a look at some of the most exciting news and highlights ahead of the first trade day at the Farnborough Air Show 2026.

Kiwi start-up targets global utility market

As the show started, Wellington-based Aviation Composites New Zealand (ACNZ) came out of stealth mode to reveal a design for an all-composite, single-turboprop feeder cargo aircraft, the AC-2 AveniQ, it bills as having 'twice the range at 40% lower operating cost' of comparable utility aircraft such as Cessna Caravans and Beech 1900s.

With the global feeder fleet of some 3,200 aircraft now averaging 20–35 years old, ACNZ argues operators are now running out of viable options for new aircraft. The ACNZs answer, the AC-2, features a 6,000lb payload carried 400–450nm at 200kt — with room for three LD3 containers and a 2,750nm ferry range. Crucially, says ACNZ, an airframe of just around 200 parts will reduce acquisition costs by 25%, while single-engine operation (a proven PT6-class turboprop) slashes operating costs by around 40%, at a target price of some $6M.

Designed from the outset for both crewed and uncrewed operations — with the feeder cargo market pitched as 'the first scalable autonomous aviation market' — the AC-2 also touts multi-mission versatility, from 19-seat passenger transport and MEDEVAC to firefighting, paradrop and a 23hr-endurance maritime surveillance UAV variant. Using off-the-shelf certified systems, ACNZ claims a de-risked 36-month path from construction start to type certificate. The company, led by CEO and head designer Lapo Ancillotti, (interestingly, also a designer of racing yachts as well as aircraft), is now seeking a launch customer.

Riders on the storm - RAF Chief lays out plan to become a sixth-gen air force

Ahead of the airshow, RAF Chief of Air Staff, Sir Harv Smyth, speaking at the RAF Global Air and Space Chiefs Conference in London, warned that "a storm is brewing and that storm is very much heading our way". To address this challenge, and secure control of the air, he revealed that as part of a "completely reset" combat air strategy, the RAF will become "Europe's first sixth-generation air force".



RAF Chief of Air Staff, Sir Harv Smyth at the Global Air and Space Chiefs Conference. (Tim Robinson/RAeS)

He revealed that the RAF will field two new uncrewed systems — Storm Chrome, an electronic warfare drone, and Storm Fire, a 1,000-mile one-way attack drone for the RAF Regiment as well as the Storm Fighter - collaborative combat aircraft (CCA) programme. Smyth said CCAs "are no longer something of the future — they are very much today's business", providing the affordable mass to complement upgraded Typhoons, an expanded F-35 fleet (including the dual-capable F-35A) and, ultimately, GCAP – which he said would "deliver absolute air dominance".

> "

He expanded: "Our new Storm Fighter CCA program will markedly shift the economic calculus back in our favour absorbing risk and enabling our crewed platforms to more readily survive."

Meanwhile space, he argued, is now inseparable from air superiority: "You cannot win the war in the air if you have already lost the war in space." A refreshed defence space strategy will see six new space squadrons and an additional space defence centre created.

Smyth concluded: "So yes, a storm may be coming, but with this strategy in place and our pathway set to become Europe's first sixth generation air force, we are well set to weather this storm and indeed create a storm all of our own if required."

Expect more details on these Storm CCAs and drones this week.

FIRST LOOK – Anduril reveal the Thunder tiltrotor CCA at Farnborough International Airshow 2026

Revealed for the first time at Farnborough Airshow is Anduril's new Thunder tiltrotor combat drone – designed to fly as a 'loyal wingman' alongside Apache-class attack helicopters.

Set to fly in 2027, AEROSPACE Editor-in-Chief Tim Robinson FRAeS gets an exclusive insight on Thunder from Anduril UK General Manager, Richard Drake.

Watch the interview here: https://youtu.be/o4jSffu4xmc?si=SH5Tf7GKudumNDgr

Small is beautiful? Airbus sees smaller city pairs drive traffic

Ahead of the show, Airbus released its latest Global Market Forecast, and while the headline figure — demand for 42,060 new passenger aircraft between 2026 and 2045 — remains eye-watering, it represents a modest cut of 390 airliners from last year's 42,450 projection. This breaks down into 33,920 single aisle airliners and 8,140 widebodies – with the existing order backlog, that Airbus is sitting on accounting for 41% and 32% of this demand.

Interestingly, Airbus now argues that urbanisation is shifting to smaller cities, with the number of smaller urban centres growing at a significantly faster pace than the megahubs that 20 years ago, the OEM predicted would drive A380 sales.
The future, says Airbus, is decentralised — direct connections between smaller city pairs rather than traffic funnelled through major hubs, enabled by efficient single-aisles that make thin routes pay. Front and centre to open up these routes is the A220, credited with opening 400 new routes across North America, Europe and Africa, with Airbus identifying more than 2,200 unserved routes suited to the type and the long-range A321XLR playing a similar role at longer range. Indeed, the airframer notes that in general, airlines are flying longer routes – with Asian and Middle East airlines expanding into the US, and detours due to warzones extending.

However, despite volatile fuel prices and conflict in the Middle East, the fundamentals remain robust; passenger traffic is forecast to grow 3.9% annually, driven by an emerging middle class in Asia-Pacific..

BAE Systems shows off CCA flight leader concepts

Ahead of the airshow, a pre-Farnborough press visit to Warton saw BAE Systems demonstrate to media one concept for a human pilot to command and control the new emerging class of combat drones in the company's Eurofighter engineering flight simulator.
Alongside the large area display and unified mission computer earmarked for Typhoon's next-generation cockpit, Andrew 'Blyty' Mallery-Blythe, Typhoon Operational Requirements Manager, BAE Systems, showed off how a single pilot might command a formation of Collaborative Combat Aircraft (CCAs) — with the company stressing these are concepts, rather than control of any specific 'adjunct' drone. While a pilot can take direct control of an individual CCA — commanding headings and altitudes via a cockpit panel, or using HOTAS to send it to a waypoint, CAP station, or to 'slave' it to stay in formation — Blythe noted this soaks up significant pilot capacity.
The company's answer is an air-to-air 'kill box': using HOTAS or touchscreen, the pilot draws a box around a group of hostile tracks on the widescreen display and the CCAs then 'sort' the targets among themselves, allocating who shoots what. The pilot retains final weapons authority, arming the box before the drones engage — with one CCA in the demo autonomously holding back to preserve weapons for later. Crucially, this exploits a risk calculus in which cheaper, more expendable CCAs can be pushed 50 miles or more ahead of the crewed fighter, shortening missile time of flight and boosting kinematic performance, while the pilot 'quarterbacks' from over 100 miles back. 'Blyty' noted that while the virtual CCAs in the sim currently do not 'crank' or evade after firing their own missiles, he expects that those behaviours would be added : "I would think they would do whatever they needed to do to posture defensively." Watching the demo and the way in which the Typhoon LAD enables the pilot to keep the map zoomed out to see this engagement at long range shows how these upgrades will help bridge the gap between today's Eurofighter and the GCAP of the 2040s.

Technically, said BAE, tasking CCAs via Link 16 messages through the unified mission computer is 'quite straightforward', with bandwidth and data links no concern. The harder challenge is minimising workload and enabling pilots to develop tactics when every fighter is itself controlling multiple aircraft.

Rolls-Royce advances UltraFan30 project

Rolls-Royce's (RR) UltraFan 30 project is advancing – a project that marks R-R's potential re-entry into the single-aisle market. At a pre-FIA2026 media briefing at its Derby base on 2 July, Jeremy Hughes, Head of De-

monstrator Programmes for Research and Technology at Rolls-Royce, said the team had completed a concept review in June – adding "things are looking very positive and we are quietly getting on with that piece of turning the ideas into hardware."
Hughes continued: "We are aligning the wider supply chain and we are going to have metal available to allow us to complete the build and start testing… in 2028."
UltraFan 30 will seek to deliver 30,000lb thrust and will sit alongside the UltraFan80, its widebody counterpart – which itself will deliver some 80,000lb of thrust and has begun build-up ahead of further ground testing this year.
The UltraFan 30 demonstrator will reuse an existing Pearl 10X core and Hughes explained that "from a demonstrator perspective, the architecture is right, the size is about right and it allows us to move the demonstrator programme forward really quite rapidly – but ultimately, we will still continue to invest in technology around the core of the engine."

Scaling down from the UltraFan 80 to the UltraFan 30 has not been without its issues and Hughes identified the power gearbox as one area that required additional thought. He said the gearbox would not move away from epicyclic, stating "we think an epicyclic gearbox is the right answer." He added: "We are confident we have produced the world's most powerful epicyclic gearbox for aerospace and we have been testing that in a number of different configurations and scenarios all the way through to routine operation to destructive testing to understand how that will behave in the range of environments [it is] possible to see."

The UltraFan 30 will also introduce some new features, including short inlet and ripple-edged outlet guide vanes. While these are not present on its widebody sibling, Hughes believes there is an opportunity "for those things to read across," adding "We have done a comprehensive programme with Boeing under the FAA CLEEN programme to explore short inlets and we have taken that all the way to flight tests – so we have a good understanding not only of the performance of the nacelle and the inlet but its coupling to the fan system. That understanding then allows us to decide where that is applicable and we feel confident that style of technology reads across market sectors."

Boeing MQ-28 Ghost Bat to test fire Meteor BVRAAM?

Spotted on the static line and still wrapped up ahead of the show's official opening was Boeing's MQ-28 Ghost Bat drone – one of a number of CCAs (Collaborative Combat Aircraft) on display at the show, as AI, autonomous systems and the need to quickly rebuild combat mass come to the fore in the face of a more dangerous world.

Intriguingly, the Ghost Bat was displayed alongside an MBDA Meteor BVRAAM – seemingly confirming a report by The Telegraph earlier this year: "This year Australia will carry out test fires from the drone of Meteor, a long-range air-to-air missile developed by the Anglo-European manufacturer MBDA."
Asked by AEROSPACE at a pre-show media roundtable whether the pairing was serious intent or air show marketing, Steve Parker, President and CEO, Boeing Defense, Space & Security, was coy on the missile itself, but pointed to the speed of previous weapons integration: "At Avalon in '25 I came out and said we were going to integrate AIM-120 onto Ghost Bat by the end of the year or early '26 – and we did it in seven months. I'm not going to talk specifically about Meteor or any other weapon, but we can certainly integrate quickly. Seven months is a lot faster than what is typical. That goes to how open the architecture is on Ghost Bat."
The incoming internal weapons bay, said Parker, will carry "two AIM-120s, or that size weapon, or four SDB-class munitions".
Fresh from Ghost Bat becoming the first CCA to fly in a multinational joint exercise, Valiant Shield 2026, Parker also stressed that December's Woomera AMRAAM test was about more than just the Ghost Bat firing a missile: "That was a validation of how we closed the kill chain – an advanced fighter with an AESA radar picking up the target, an E-7 Wedgetail in the loop commanding the autonomous CCA to take the shot. It's not about the aircraft – it's all about the autonomy, it's all about the AI."

All eyes on Ethiopian for opening day order – but who else could be buying this week?

Farnborough Airshow is always a hotbed of airliner orders, with OEMs and carriers holding back announcements to make in the chalets during the week. The last show, in 2024, resulted in £81.5bn worth of orders placed for 286 aircraft, including 161 widebodies.

One announcement hotly tipped to come during the coming week is Ethiopian Airlines' order for narrowbody aircraft – with Airbus, Boeing and Embraer all reportedly in contention.

Speaking to the media ahead of the show, following the inauguration of its new passenger service to Mauritius, the carrier's CEO, Lemma Yadecha, hinted at an order for up to 25 aircraft with options for ten more. However, Yadecha did not confirm whether the deal would be placed for the Boeing 737 MAX, Airbus A220 or Embraer E195. Yadecha also hinted at a possible deal to buy 16 freighters, with options for eight more.
Media reports also indicate that one of the world's largest aircraft lessors, SMBC Aviation Capital, is preparing to

order 100 narrowbody airliners. Will the order be placed at Farnborough and will it be for the Boeing 737 MAX or Airbus A320neo?

Reports from Reuters earlier in the month suggest that Philippine Airlines is also likely to announce orders at the show, with a mixed buy of nine Airbus A350-1000s and 15 Boeing 787-10 Dreamliners. Elsewhere, Bloomberg has suggested that German airline, Condor, could be looking to sign a deal for six Airbus A330neo aircraft at the show. Meanwhile, local media hints at Saudi Arabia's Riyadh Air placing an order for an additional 25-30 Boeing 787 Dreamliners during the show, although, if this comes to fruition, it is more likely to involve the conversion of some of the 33 options it currently holds with Boeing. It already has firm orders for 39 examples. Elsewhere in the Middle East, UAE-based media has reported that Abu Dhabi-based Etihad is preparing to announce an order for ten Dreamliners during the show and flynas is rumoured to be converting some of its Airbus A330neo options into up to eight firm orders.

Further afield, with its first A350-1000ULR now entering flight testing ahead of its ambitious Project Sunrise non-stop flights to Australia, Qantas is also reported to be considering the purchase of 20 additional widebody aircraft. While negotiations remain ongoing – and no hint has been given as to whether the carrier is looking to increase its 787 or A350 fleets – there has been speculation that the deal could be complete in time for a Hampshire announcement.

With carriers including Air India, LOT Polish Airlines and Turkish Airlines all evaluating future fleet expansion plans, and SAS reportedly in negotiations with Airbus for a mix of 15-20 A350 and A330neo widebodies, the coming week could be very interesting indeed.

Eve demonstrator back in the air for transition phase

Over at EVE Air Mobility, the Embraer-backed eVTOL developer revealed that its Eve technology demonstrator had returned to flight just the previous after a three-month pause for modifications for the milestone transition phase - expected to complete later this year. Structural strengthening of the airframe was needed, said CEO Johann Bordais against vibration from the rear pusher propeller.

The envelope would then be progressively expanded, accelerating the aircraft from around 25kt towards 50kt, en route to the 90kt threshold at which the lift rotors shut down and the aircraft achieves full wingborne transition.

Meanwhile, Eve also confirmed that assembly of the first of six conforming Eve 100 prototypes begins later in 2026 at São José dos Campos, Brazil. Unlike the technology demonstrator these will be piloted, with ANAC certification targeted for late 2028.

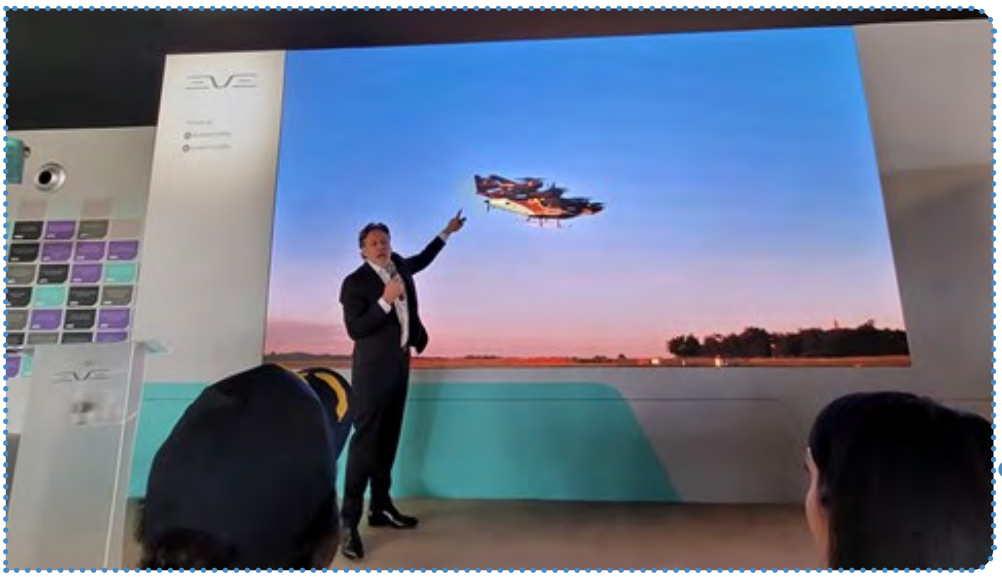
Eve also revealed two new LoIs for the Eve 100 - up to 30 for Moov (worth $150m) and up to 16 (worth $80m) from lessor Shearwater Global Capital.

Boeing delivers 2026 Commercial Market Outlook

Nearly 44,000 new jets are needed in the next 20 years, claimed Boeing as it delivered its Commercial Market Outlook (CMO) ahead of FIA2026.

The airframer's CMO – also its 65th – looks at current events and historical trends to deliver a projection for the next 20 years across commercial aviation activities, including what it described as a "resilient" air cargo sector.

Darren Hulst, Boeing's Vice President – Commercial Marketing, delivered this year's CMO. He explained the breakdown of the jets needed would be comprised of 930 freighters, 33,545 single-aisle airframes, 7,715 widebody airframes and 1,435 regional jets.



CEO Johann Bordais with the breaking news that the demonstrator was back in the air. (Tim Robinson/ RAeS)

Fleet replacement was described as "the most stable segment of the market" and Hulst claimed "about 80-85% of the fleet will be replaced over the next 20 years" – representing approximately 21,475 aircraft – due to "ageing, obsolescence and other reasons."

He added the replacement focus is on advanced economies but noted "some of the emerging markets over the last two decades actually have significant and rising replacement requirements as well – and this includes the fleet in China, which now numbers over 4,000 aircraft."
Hulst also said Boeing's undersupply is "unlikely" to clear this decade, explaining the shortage is more in the single-aisle market because of "the sheer size of the fleet" – though added Boeing believes "the widebody market will be undersupplied for a slightly longer period of time."
Hulst commented the demand for air travel will rise and said "the rising middle class is a very strong indicator of rising demand for air travel. As we look over the next 20 years… about 500m new households will enter the middle class in the top 20 emerging markets." He said this embourgeoisement "is really a driver of growth as we look at the next two decades in that long-term category of air travel demand."
On air cargo, Hulst said "a little bit more than 15% of global airline revenues come from air cargo" and is an area he expects to grow over the next two decades.
He offered the growth of e-commerce and the importance of high-value goods to be flown as a driver for market growth – a trend he believes will continue.
Said Hulst: "Only about 1% of global trade volume is actually carried by air, but the value of that trade is about 35% of global trade". He commented that the "extensive growth" of AI will continue to drive growth in air cargo – adding "over 70% of AI-related goods… are transported by air and over 90% of the chips themselves are in the air cargo segment."



Can Dowty RISE to the occasion for Open Rotor? (Tim Robinson)

Shortly after the CMO concluded, Boeing announced its second quarter deliveries. It said it had delivered:

- **129 737s (243 year-to-date)**
- **Ten 767s (16 year-to-date)**
- **Seven 777s (15 year-to-date)**
- **25 787s (40 year-to-date)**

GE taps into Dowty propeller expertise for RISE

What links the 1940 Spitfire Mk1 and CFM International (CFM) next-generation Open Rotor RISE engine that is aiming to deliver a step change in fuel savings for the airline industry? On the face of it, not much, but a pre-Farnborough media visit to GE Aerospace's Dowty, a GE Aerospace company facility in Gloucester revealed how the US engine giant is tapping into Dowty's heritage and expertise in variable pitch, composite propeller blades. In particular, it was the company's (then Rotol) variable pitch propellers that transformed the early Spitfire's performance during the Battle of Britain. Today its factory produces advanced and highly durable composite propellers for aircraft such as the C-130J and Q400.

Meanwhile, CFM's RISE engine, being proposed for next-generation single aisle airliners, takes bypass ratios to over 60+ by dispensing with the cowling – to achieve potentially a 20%+ reduction in fuel burn. Crucially the open rotor's blades spin slower at 1,000rpm compared to 3,000-4,000rpm on a typical turbofan – making Dowty's propeller expertise a natural fit. Arjan Hegeman, VP of Future Flight Engineering, GE noted: "If you construct that slow moving blade like we would do with turbofan blade, you're not doing it right. You get a very non-optimised solution. So Dowty is feeding into CFM with all that experience on slow-moving turboprop blades with extremely high durability. Same on the pitch change mechanism that we're using for these blades, it's all built and designed on Dowty's experience and legacy."

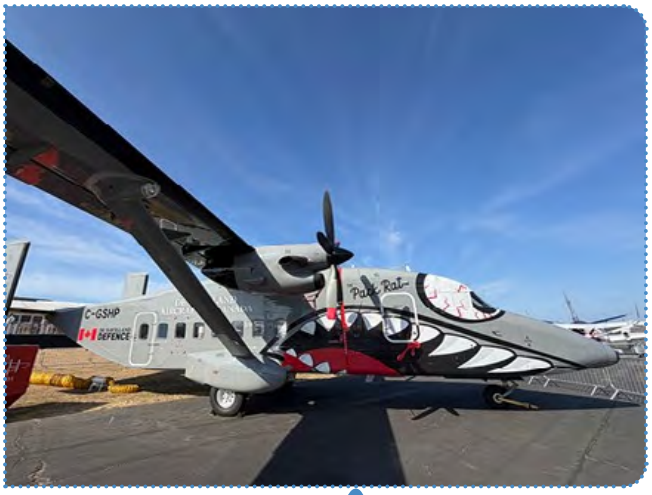
Open rotors or unducted fans have been tried before, most notably with the GE UDF GE36 in the 1980s but fell short due to the increased noise generated compared to a traditional turbofan. However, a breakthrough has come in supercomputers and AI over the past decade allowing incredible fidelity of engine modelling. Tested in these industrial supercomputers, RISE will be quieter than CFM's LEAP engine.

Interestingly, GE and CFM partner Safran are also focusing not just on fuel burn with the RISE open rotor, but increased durability and reliability – a product of airline complaints about unreliable next gen engines such as the GTF, that while highly-efficient have faced teething problems. Says Hegeman: "When we do an actual product, maybe I put a little less in the core, maybe I dial

down my temperatures a little bit. Now I have an engine that still far exceeds what a ducted can do, so I have better performance, but I also blow it away from a durability perspective, and if there's anything we've learned over the last years is that durability matters as much, if not more than fuel efficiency".

To that end GE has invested £12m in Dowty to support jobs and equipment, while the company has also received funding from the UK's Aerospace Technology Institute for its composite Resin Transfer Moulding (RTM) technology.

Introducing The Pack Rat



One of the more striking schemes to be found at FIA2026 comes in the form of this Short SD3-60 from De Havilland Canada. (RAeS/Stephen Bridgewater)

Aerospace firms lack the digital backbone to scale AI, says Capgemini

A new report issued by Capgemini on the eve of the Farnborough Airshow reveals that only 6% of aviation and defence organisations have achieved the end-to-end digital continuity needed to properly implement AI.

The Realising augmented engineering: The role of AI and digital continuity in aerospace and defence transformation report finds that while augmented engineering (namely the convergence of digital continuity and AI to create connected, intelligent, and adaptive engineering environments) is emerging as a new source of competitive advantage, most aerospace and defence organisations still lack the connected data, workforce readiness and governance needed to scale it across the full engineering lifecycle.

Of companies surveyed, 73% said digital continuity supports production ramp-up but 85% cited fragmented lifecycle data as the most common barrier to scaling these initiatives.

While AI is gaining traction it remains in the early stage, with 53% of those surveyed saying they still relied on document-based exchanges with Tier-2 and Tier-3 suppliers and 61% saying they use AI purely for experimental or task-level purposes. Only 17% reported workflow orchestration or end-to-end AI integration.

Notably, talent shortages across engineering remain top of companies' concerns, with 81% citing talent and skill shortages across engineering, digital and AI as a significant threat - but only 46% feeling well prepared to address them. Organisations quizzed estimated that around 68% of the engineering workforce will need reskilling or upskilling.

The year of the CCA?



Making an appearance at this year's show is Airbus' Ravenstorm CCA. (RAeS/Tim Robinson)

> *Revealed at ILA Berlin in June, the Ravenstorm is a CCA from Airbus.*

GE/BETA hybrid electric demonstrator to fly in daily show

GE Aerospace and BETA Technologies' hybrid electric Saab 340 testbed is expected to feature in the daily flying display. The aircraft is to be fitted with a megawatt class hybrid electric propulsion system and forms part of NASA's Electrified Powertrain Flight Demonstration (EPFD) project. The powertrain works in conjunction with the starboard turboprop, integrating an electric motor generator and an Avio Aero gearbox into a parallel hybrid configuration. High capacity BAE Systems lithium based batteries will be carried in the fuselage enabling the starboard Dowty propeller to be driven by the turboprop, the electric motor or a combination of both. GE Aerospace announced in June that it had completed ground testing of the EPFD project, paving the way for flight tests to begin.

Flying the flag



Local production of the T-7 is being proposed. (Tim Robinson/RAeS)

Over on the BAE Systems stand, there was no mistaking which country this Boeing/Saab T-7 Red Hawk advanced trainer was aimed at. BAE Systems is the UK partner for the T-7, which is being proposed as a replacement for the RAF's Hawk T1A and T2 trainers - including the Red Arrows. The publication of the UK's DIP has allocated £360m for the "Completion and fielding of the new British Jet Trainer System, to include new aircraft for the Red Arrows."

Honeywell Aerospace goes solo with GPS denied tech

With Honeywell Aerospace now flying solo as a standalone aerospace and defence company, the company showed off some of its resilient navigation, autonomous flight and C-UAS technology, the majority developed in Europe, to a select group of media at its outdoor demonstration JAMFEST near Barcelona.

With lessons from Ukraine and Iran showing that "GPS is no longer a reliable source of navigation", the company argued that assured PNT is now mission-critical — and, pointedly, that almost everything on display was developed outside the US, largely ITAR-free and thus "available for the global market". Honeywell Aerospace's European engineering footprint, said Tomas Szaszi, head of technology strategy for its European engineering centre, spans more than 1,200 engineers and scientists across the Czech Republic, Poland, Italy and the UK, incubating six of NATO's nine disruptive technology areas under an 'indigenous framework' — researched, designed and developed by European personnel, in European legal entities, on European soil, with little to no IP originating outside the EU.

Live demonstrations during the day included a UAV navigating via radar velocity panels — 80GHz narrow-beam radars measuring groundspeed that are extremely difficult to detect — flying a 2.5km circuit and landing back on its take-off spot entirely without GPS. Meanwhile, a larger fixed-wing UAV demonstrated alternative navigation using hard-to-jam low Earth orbit Iridium satellites plus vision-based navigation, with Honeywell Aerospace's view, that the future lies in fusing multiple navigation sources rather than any single technology – with the solution .

Also on show: a ground control station enabling one operator to fly multiple UAVs BVLOS, a sensor- and effector-agnostic counter-UAS command and control system, SAMURAI (Stationary and Mobile UAS Reveal and Intercept), aimed at critical infrastructure protection rather than traditional air defence. This is AI-enabled, can fuse various sensors and can even identify types of drone and even whether they are carrying weapons.

A 'mini expo' rounded out the day, including a fully integrated electromechanical actuation and compact fly-by-wire flight control system — a move away from traditional hydraulics, certified to fly high-end UAVs — and an AI-driven mission planner that shapes trajectories to where terrain- and vision-based navigation perform best.

The NXT generation



The General Atomics AeroTec Systems Do228 NXT demonstrator is making its Farnborough debut this year - following its rollout post-retrofit at ILA Berlin in June. (RAeS/Stephen Bridgewater)

Is A220-500 a stretch too far?

Reports earlier this year suggested that Airbus had begun negotiations with airlines to create a stretched version of the A220 regional jet, with sources claiming the new airliner could be launched during this coming week's Farnborough Airshow.

Although Airbus has downplayed the -500 project in recent weeks, AirAsia and Air Canada have been mooted as potential launch customers. If it comes to fruition, the proposed A220-500 is expected to increase seating from the current 110-160 passengers to 180 seats within a stretched fuselage – albeit potentially with a loss of range. The 'simple stretch' concept is thought to

minimise development costs by keeping the A220-300's existing engines and wings.

Boeing announces 2026 ecoDemonstrator

This year's Boeing ecoDemonstrator Explorer programme gets underway shortly after Farnborough and sees Lufthansa and Rolls-Royce collaborating with the OEM for the first time to test technologies to improve fuel efficiency and reduce noise.

Supporting the FAA Continuous Lower Energy, Emissions and Noise (CLEEN) programme, the trials will be conducted on a Boeing 787-9 Dreamliner that is scheduled to be delivered to Lufthansa at a later date and features Rolls-Royce Trent 1000 engines. Test points include evaluation of the 'Next Generation Inlet', a reduced-length engine inlet demonstrator with advanced acoustic treatments that enables the integration of more fuel-efficient engines onto future airframes. It also reduces weight and drag while maintaining the acoustic performance.

Tests will also investigate modified departure and arrival procedures, including Intelligent Operations flight paths, which aim to reduce noise around airports and are algorithmically generated using multiple data sources to identify opportunities for fuel-efficiency and noise benefits.

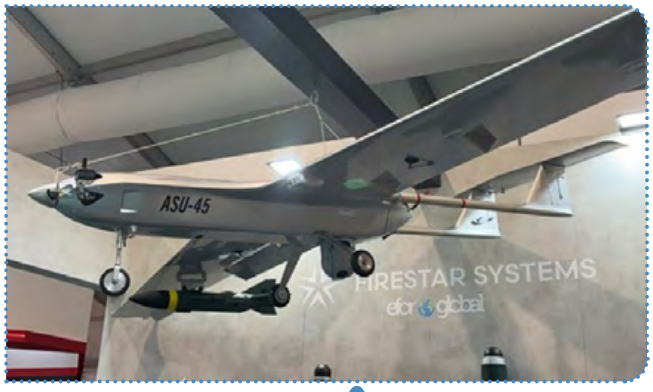
The ecoDemonstrator programme began in 2012 and, according to Boeing, has accelerated innovation by taking 260 new technologies out of the lab and testing them in an operational environment.

Heads-up – fighter pilot helmet testbed to debut at FIA

BAE Systems is set to reveal its next generation fighter pilot helmet technology at Farnborough on Monday morning. Project Intuity combines a number of capabilities to show how future flying helmets could reduce a pilot's workload, improve their situational awareness and support faster, more confident decision-making – especially in complex, data-rich environments. Described as a "modular testbed", Intuity will combine existing and emerging via a flexible system architecture to evaluate and develop new capabilities such as display optics and eye tracking.

The helmet will integrate battlespace visualisations straight onto the pilot's visor and is designed to filter and prioritise that data to give pilots what is needed at any particular time in a flight. With double the display area of current helmet mounted systems, Intuity provides an extended field of view with which to present safety, sensor and targeting information exactly where pilots need it, without the need to look away. The demonstrator also has head tracking and 3D audio cueing and is designed to support live virtual constructive training and future autonomous collaborative platform cueing.

Turkish delight



Ankara-based Firestar Systems has brought a demonstrator of its ASU-45 TUAS. (RAeS/Stephen Bridgewater)

Firestar say the platform can be optionally fitted with two hard points that can accommodate payloads such as last generation EO/IR sensors, synthetic aperture radars, IMSI catchers and radio repeaters.

Bodycote boosts thermal processing capacity across Europe

Advanced heat treatment and specialist thermal processing company, Bodycote, has announced a multi-million pound investment across its European network to support growing demand from aerospace and defence customers. The programme includes new Hot Isostatic Pressing (HIP) equipment in France and Germany and expanded specialist powder metallurgy capabilities, increasing capacity for the processing and manufacture of critical, high-performance components. The investment includes installing multiple large-format HIP vessels that increase available processing volumes, enabling larger components to be treated while increasing capability and energy efficiency.

Textron rings the bell at Farnborough

Textron's Bell Helicopter division is demonstrating a full scale mock-up of its MV-75 Cheyenne tiltrotor at the show. The US Army's newest vertical lift asset, the newly renamed Cheyenne has been designed to provide the Army with a long-range, high speed, multi-mission aircraft that reduces the crew's exposure in contested environments.

Bell will also have two aircraft from its commercial lineup on display: the Bell 505 and Bell 407GXi. Both types are also in use with military operators, with the 505 serving as the rotary winged training platform for the militaries of Albania, Bahrain, Indonesia, Iraq, Jamaica, Jordan, Montenegro, South Korea and the UAE.

ESA releases 2026 Space Economy Report

Ahead of Farnborough, the European Space Agency (ESA) has released its Space Economy Report giving an overview of the latest developments shaping Europe's space sector.

The report reveals that global governments invested €119bn in space during 2025. This represented a 3% decline from 2024, driven largely by US defence budget changes and flat NASA funding. Conversely, European space budgets grew by 12% to €13.5bn year-on-year. This was a double-digit growth rate for the first time in five years, mainly due to increased national defence spending led by Germany.

ESA says the upstream market – focusing on the spacecraft manufacturing and launch service provision segments – is now valued at €75bn annually, with 80% institutional demand now dominated by defence. European prime contractors regained market share in 2025 capturing 10% of global capacity and 65% of their accessible market.

The downstream market was valued at around €490bn in 2025 and largely comprised of commercial operations such as satellite communications, Earth observation and Global Navigation Satellite System (GNSS)-related markets.

Private investment in space leaped 60% in 2025, largely due to a 177% rise in US activity. European space ventures raised €1.4bn of private investment last year, an 8% drop from 2024 but still the second-highest annual total on record.

Mammoth debut

Texas-based passenger-to-freighter (P2F) conversion company Mammoth Freighters has brought one of its recently FAA certified Boeing 777-200LRMF (Long Range Mammoth Freighter) airframes to the show. The aircraft – which is the first of nine to be converted for DHL Air UK – features a reinforced floor structure and Collins Aerospace's flexible cargo-handling system. The appearance comes shortly after Mammoth confirmed it was to open an additional P2F conversion line in Qingdao, China in September.

Embraer showcases strong growth at Farnborough

Brazilian OEM, Embraer, is attending Farnborough with an example of its E195-E2 airliner and KC-390 Millennium military airlifter. Both will be on static display and the KC-390 is scheduled to appear in Monday's flying display.

The company's presence highlights its continued growth momentum with increasing aircraft deliveries and a record backlog. During the first half of 2026, Embraer delivered 109 aircraft (up from 91 in the same period last year).



Registered N703DN, this 777 began its life in passenger service for Delta prior to its conversion. (RAeS/Stephen Bridgewater)

"Embraer is set for a sustainable growth, supported by strong demand across our businesses, expanding global presence, and continued investments in efficiency and innovation," said Francisco Gomes Neto, president and CEO of Embraer on the eve of the show. "We see consistent demand across all segments of the business, and Farnborough provides a unique opportunity to engage with customers, strengthen partnerships, and pursue new business opportunities around the world."

Clinserts unveiled

Belgium's Anemo Engineering will unveil three dedicated Clinserts tools on Monday morning at Farnborough. The move comes as the company warns airline and military engine maintenance teams about the continued use of non-dedicated, high risk methods for removing and installing key locking threaded inserts. Anemo has therefore produced three purpose built Clinserts tools: the Extrakt tool, the Resisteel broaching tool and the PRO tool – designed to bring control, repeatability and safety to a process that it claims remains vulnerable to human error.

PULSHN to debut autonomous Whippet

Toronto-based PULSHN, which is developing uncrewed aerial systems and proprietary propulsion technology, is attending Farnborough to showcase its vision for the future of autonomous aviation. Using patented, scalable, uncrewed eVTOLs the company is promoting its vehicles for civil and defence logistics applications. It has already flown its 10kg Whippet UAS, which has a 4kg useful load. The company also has aspirations to create a heavy-lift vehicle with a 1t useful load..

Speaking ahead of the show, CEO Gem Venturino, who previously served as Head of Strategy & VC to the Royal Navy CTO, and worked in Defence Procurement during her 8 years at the UK MOD, said "This is an opportunity to introduce our vision, build strategic relationships and demonstrate how we're approaching the future of autonomous aviation differently. By focusing on proprietary

propulsion technology and scalable aircraft platforms, we're laying the foundations for the next generation of intelligent aerial systems."

Cambridge Aerospace to showcase Skyhammer and Starhammer



Skyhammer was developed in around six weeks. (Tim Robinson/RAeS)

UK start-up, Cambridge Aerospace, is exhibiting examples of its low-cost air defence systems at the show. Its stand will include examples of its Skyhammer, a low-cost, modular interceptor, and Starhammer, a high-speed interceptor for higher-value missiles. The company's presence is highly topical as last week the UK MoD awarded it a contract under the Low-Cost Air Defence Effectors (LCADE) programme. Cambridge Aerospace has already been awarded a multi-million-pound MoD contract to deliver Skyhammer interceptor platforms – which have a 30km range and a 434mph top speed – to the UK military and Gulf partners to counter Shahed-style drones and low-speed missiles. Conversely, Starhammer has a top speed of around Mach 2.0.

Tail of the show?



While several aeroplanes in the static park have interesting liveries, it is hard not to admire the design on the tail of the Leonardo T-345A. (RAeS/Stephen Bridgewater)



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TIM ROBINSON FRAeS, STEPHEN BRIDGEWATER-FRAeS and DOMINIC WARD
20 July 2026

For more information
please visit https://www.aerosociety.com/news/farnborough-international-airshow-2026-day-zero/

Successful flight of DLR sounding rocket MAPHEUS®-17

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center



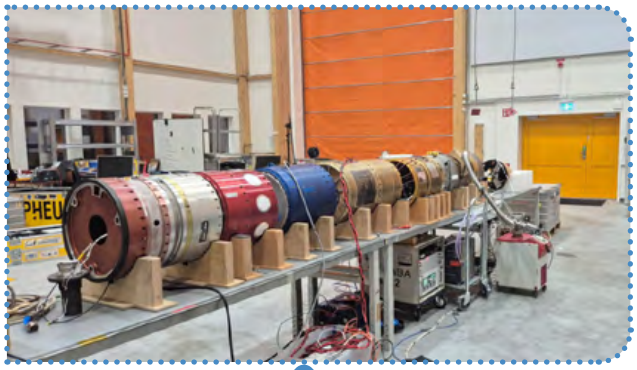
Credit: DLR (CC BY-NC-ND 3.0)

DLR sounding rocket MAPHEUS®-17 leaves the launch tower
To propel the rocket to an altitude of almost 300 kilometres, two rocket motors were used: a Red Kite as the lower stage and an Improved Malemute as the upper stage.

- DLR's MAPHEUS®-17 sounding rocket lifted off from the Swedish Esrange Space Center on 1 October 2026. It carried a payload of more than 360 kilograms to an altitude of just under 300 kilometres, providing approximately seven minutes of research in microgravity.
- Regular flights within the MAPHEUS® programme allow experiments to be flown multiple times and refined in a targeted way.
- Standardised experiment modules offer simple, cost-effective access to microgravity research.
- During the rocket flight, DLR also used its Falcon 20E research aircraft to test, for the first time, methods for specifically detecting and analysing rocket emissions in the atmosphere.
- Focus: Space, high-altitude research rockets

On 1 October 2026 at 08:51 CEST, the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) sounding rocket MAPHEUS®-17 was launched from the Swedish Space Corporation's (SSC Space) Esrange Space Center. The almost 12-metre-long rocket, with a launch mass of 2.3 tonnes, flew for approximately 16 minutes over the tundra of northern Sweden. It carried more than 360 kilograms of payload and reached a maximum altitude of just under 300 kilometres.

Two rocket motors provided the propulsion: the Red Kite, developed jointly by DLR and Bayern-Chemie, as the lower stage, and an Improved Malemute as the upper stage. After the propulsion stages had separated, the payload at the tip of the rocket continued its flight on a parabolic trajectory. During this free fall back to Earth, the numerous scientific and technological experiments onboard experienced microgravity conditions for approximately seven minutes.



Credit: DLR (CC BY-NC-ND 3.0)

MAPHEUS®-17 payload during assembly
In the days before the rocket launch, researchers integrate the experiments into the modules. These are then connected to one another. Step by step, the payload, which sits at the tip of the rocket, takes shape.

A parachute system slowed the payload during the final phase of its descent, and it landed safely in the designated area and was then recovered by helicopter.

Regular flights – from snapshot to test series

A key feature of the MAPHEUS® programme is its regularity. Since 2009, flights have generally taken place

every year. This means researchers can do more than test their experiments once in microgravity for a few minutes – they can develop them further and fly them again. The results obtained in this way can then be compared with one another. "This is the only way to systematically answer research questions and to advance technologies in rapid development cycles. With the MAPHEUS® high-altitude research programme, DLR offers regular and easy access to research in microgravity," says Thomas Voigtmann, project lead at the DLR Institute for Frontier Materials on Earth and in Space.

One of the experiments on board MAPHEUS®-17 was the DLR ARTEC (**A**e**R**ogel **TE**chnology for **C**ast alloys) experiment, which flew once again. ARTEC investigates how metal alloys solidify in microgravity. To do this, shortly before launch, the material samples are melted and kept in a liquid state under vacuum conditions in five miniaturised special furnaces. As soon as microgravity sets in during the flight, the samples cool down and solidify. Without the influence of gravity, the fundamental processes that take place as the material solidifies can be observed more precisely. These processes have a decisive influence on the material's internal structure and therefore on its mechanical properties.

For industry and early-career researchers – standardised modules make research in microgravity easier

Another advantage of the MAPHEUS® programme is that the rockets can carry up to 16 small, compact experiments. DLR developed the two MOSAIC modules (**M**icro-Experiments **O**n **S**ounding Rockets **A**s **I**nsert **C**ubes) for this purpose. These modules feature standardised mechanical, electrical and digital interfaces, allowing experiments to be integrated into the rocket's payload relatively quickly. As with small satellites, the basic format is a cube with an edge length of ten centimetres. For slightly larger experiments, several of these cubes can also be combined.

A total of ten of these small, standardised experiments were carried on board MAPHEUS®-17 in the MOSAIC 1 and MOSAIC 2 modules. The DLR experiments included VESICOLOS, a miniaturised microscope that can be used to study cells, biofilms or membrane structures under space conditions. The flight on the MAPHEUS® rocket is an important step towards further developing the experiment, specifically for use on an orbital space station.
Another DLR experiment was TEGonaut, which investigates the extent to which thermoelectric generators



"The MAPHEUS® sounding rockets are more than flying laboratories – the programme is developing into a flexible test platform for technologies that can later be used on satellites or orbital research stations. At the same time, we are opening up the MAPHEUS® programme more widely to industry. This gives companies fast, established and comparatively cost-effective access to experiments in microgravity."

Anke Pagels-Kerp, DLR Divisional Board Member for Space

(TEGs) can be used to supply electricity to sensors and payloads. Several miniaturised TEG modules were on board the research rocket for this purpose. Put simply, these generators convert available heat into electrical energy. This can be particularly advantageous for space applications, as TEGs have no moving parts and can provide small amounts of electrical energy even under extreme conditions.
Four further compact experiments came from teams of young researchers. Participants in the 'Jugend hackt' initiative, as well as school pupils working with the DLR_School_Labs at DLR sites in Cologne and Oberpfaffenhofen, developed their own experiments and sent them into microgravity for a few minutes. The young participants investigated, for example, how liquids behave in microgravity, and developed their own measurement platforms based on microcomputers and numerous sensors. With the support of many sponsors, a group of pupils from the Otto-Hahn-Gymnasium in Bensberg near Cologne was able to follow the launch preparations on site in northern Sweden.

DLR also used the rocket flight to test new methods for transmitting large volumes of data and processing GPS signals, as well as new flight computers – including systems from the Scottish start-up Aurora Avionics.

Test flight trials methods for measuring rocket emissions

As part of the MAPHEUS®-17 flight, DLR also tested for the first time whether and how rocket exhaust gases can be scientifically recorded and measured. A few minutes after the high-altitude research rocket lifted off, the DLR Falcon 20E research aircraft flew into the airspace, which air traffic control had reopened for this purpose. The specialised aircraft was equipped with extensive measurement and sensor technology and circled for approximately one hour at altitudes between two and six kilometres. The particular challenge was flying the research aircraft as precisely as possible into the research rocket's exhaust plume, which spreads and thins over time. Before and during the flight, the pilots were therefore in close contact with the MAPHEUS®-17, SSC Space and air traffic control teams.

> "Our aim was to show that such measurements are possible and how best to conduct them. Given the rapidly increasing number of rocket launches – particularly for deploying 'megaconstellations' of several hundred to tens of thousands of small satellites – the potential impact of these launches on the atmosphere is increasingly coming into focus," says Pagels-Kerp. "At DLR, we have unique capabilities for collecting reliable empirical data to investigate potential effects on the atmosphere at an early stage and develop technological solutions – for example in the field of environmentally and climate-compatible rocket propellants."



MAPHEUS®-17 payload waiting for its mission
Once the payload has been fully assembled, final tests take place. It is then packed into a container, taken to the launch tower and connected to the rocket motors there.

MAPHEUS® – research and development under one roof

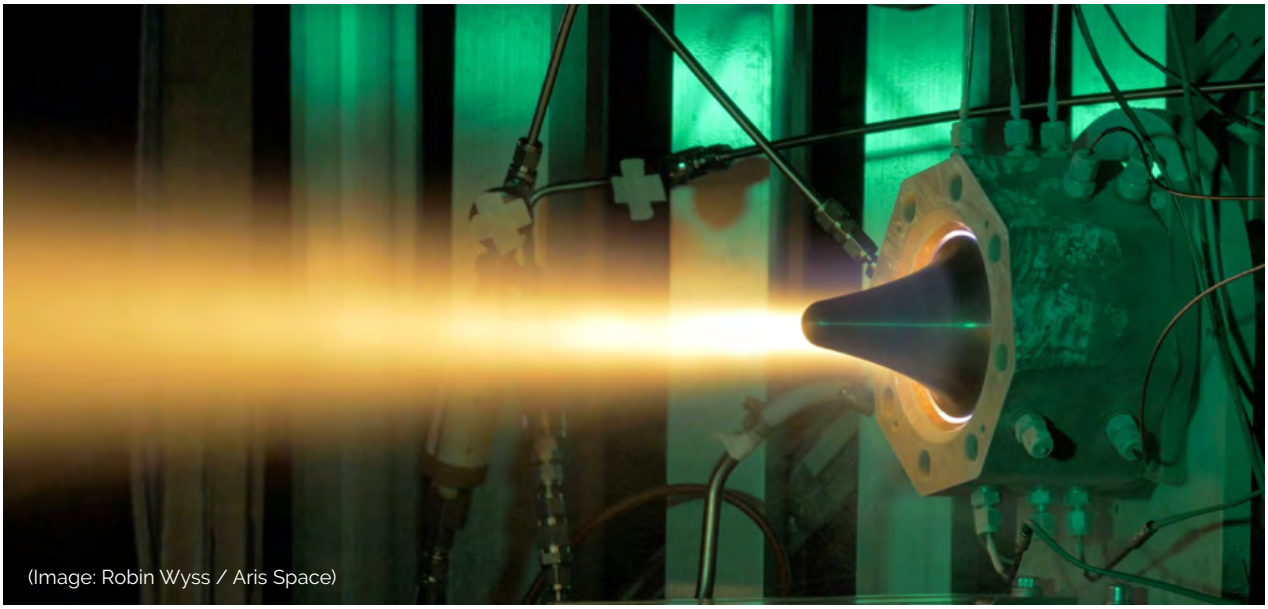
MAPHEUS® stands for 'Materialphysikalische Experimente unter Schwerelosigkeit' (materials physics experiments under microgravity). On the scientific side, the programme is managed by the DLR Institute for Frontier Materials on Earth and in Space and the DLR Institute of Aerospace Medicine. The Mobile Rocket Base (Mobile Raketenbasis; MORABA), part of DLR's Space Operations and Astronaut Training institute, develops and operates the rocket systems and conducts the flight campaigns. Launches take place from the Swedish Space Corporation's (SSC Space) Esrange Space Center in northern Sweden.

The contact for this article is Denise Nüssle
Please visit https://www.dlr.de/en/latest/news/2026/successful-flight-of-dlr-sounding-rocket-mapheus-17 for more information.

Developing a rocket engine after two years of study by ETH Zurich

By – Michael Walther, Corporate Communications

ETH zürich



(Image: Robin Wyss / Aris Space)

Across the globe, research is under way on this new type of rocket engine, which is both more efficient and more powerful: ETH students from the Swiss student space initiative Aris have developed and tested their own Rotating Detonation Rocket Engine.

In brief

- ETH students from the Aris space initiative are developing and testing a special rocket engine.
- So-called Rotating Detonation Rocket Engines (RDREs) promise greater efficiency because the fuel detonates in a controlled manner, unlike conventional combustion.
- The development of such engines is challenging, as extreme temperatures, high pressure and rapidly rotating detonation waves put a strain on materials and construction.

It's a quarter to nine in the evening when Barbara Parys, ETH student and safety officer at the rocket test, issues the order: "From now on, nobody is allowed to move until after the firing." Nobody is allowed to leave their position. Parys, like all rocket engineers, transmits in English. She is studying for a Bachelor's degree in interdisciplinary sciences and, together with 19 other colleagues, is a member of the Pegasus team of the Aris student space initiative.

Her colleague is about to ignite a new type of rocket engine for testing. The location is Dübendorf airfield. Parys and her colleagues from the ten-strong test team crowd around the four screens of the control centre in a small hut, shielded and at a safe distance from the propulsion unit. Several cameras film the hexagonal copper component, which is about the size of a plate and looks a little like an oversized nut. It is mounted on the back of a stainless-steel plate on a car trailer, together with a superstructure of aluminium profiles, various pipes, sensors, cables and pressure tanks forming the test rig.

Liquid oxygen steams out of the engine. It is a propellant component and pre-cooling the system.

Everything glows green in the special light for the high-speed camera. Together with data from pressure sensors, it will later show whether the team has achieved its goal, namely whether a stable detonation wave is forming in the engine. If it succeeds, Aris would be the first student team in the world to ignite an RDRE with liquid fuel. There are only around a dozen countries in the world where such rocket engines have been developed and successfully tested.



Final preparations on the test stand. The compact engine is located above the licence plate. (Image: Daniel Winkler / ETH Zurich)

You can literally feel the tension in the team. Apart from the brief announcements from the control centre, everything is silent. "Temperature: -100 degrees. Pressure: nominal." Temperature and pressure are OK. And then over to the security guards on the airfield, who take cover behind the earth wall to ensure that nobody enters the test site: "Final surveillance check?" "Clear!"

Project work in the third year of study

Mattia Röösli has already replayed this moment in his mind several times, so the movie is starting to roll in his mind's eye. The team ignited the engine for the first time a week ago but failed to produce a detonation wave. What if it really works today? He and the Pegasus team at Aris have been working towards this moment for almost a year.

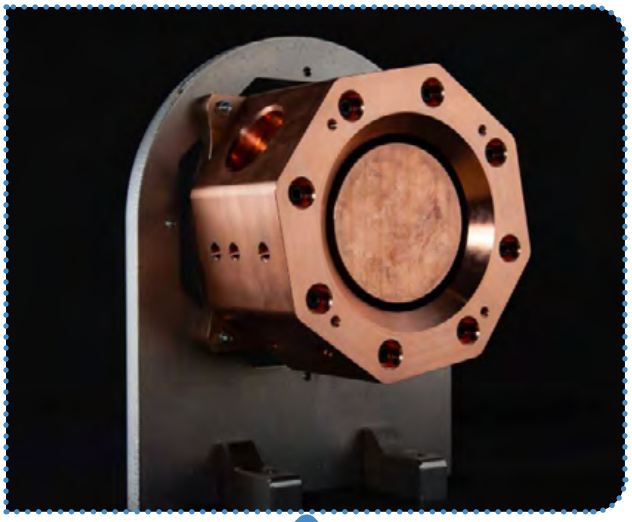
Röösli is 21 and in his third year of studying mechanical engineering.

At Pegasus, he developed the injector, the heart of the engine. Rocket engines always need two components: fuel and an oxidiser, which supplies the oxygen required for combustion. The team opted for propane and liquid oxygen. The injector generates the correct mixture during injection.

Some of his work on the engine was carried out as part of his studies: projects such as Pegasus are an integral part of the curriculum for various degree programmes at ETH Zurich. They have existed for some time in the form of Focus Projects for mechanical engineers. Teams of five to ten students develop and realise a product with all the relevant components and accompanying elements over two semesters: finance, conception, design, engineering, simulation, draft design and production. The results include aeroplanes, driverless cars, robots – and even rocket engines.



Mattia Röösli developed the injector, the centrepiece of the rocket engine. (Image: Daniel Winkler / ETH Zurich)



The engine (shown here without the spike-shaped aerodynamic attachment) was printed from copper. The injector is located on the back. (Image: Robin Wyss / Aris Space).

Controlled detonations for greater efficiency

Pegasus has set itself the goal of developing and testing a bi-liquid RDRE. The project is largely financed through sponsorships. Industrial companies provide the team with a substantial amount of material and services, and in some cases also with funds.
The expectations on such engines are decidedly high: the aim is to deliver around 10 to 20 percent more power with the same amount of fuel.

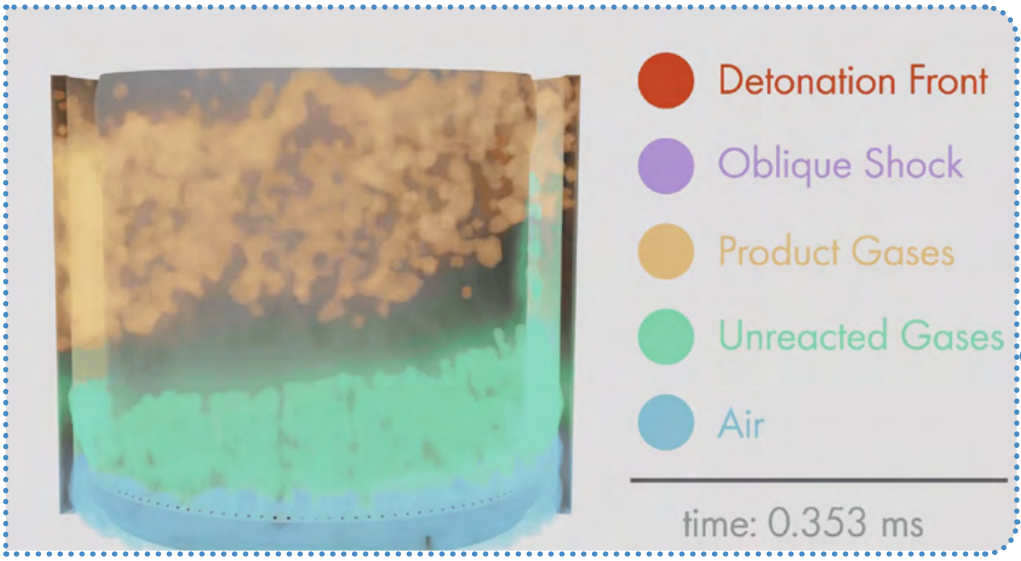
This is because the fuel in such engines does not burn evenly and steadily, but instead detonates, producing an explosion-like wave that constantly moves in a circle. The shift in burning method leads to the extremely high pressures and temperatures. This means that the energy contained in the fuel is better utilised than in conventional engines.
At the same time, the technology requires fewer complex components to compress the fuel, making the engines more compact and potentially lighter.
Because fuel accounts for 80 to 90 percent of the total weight when launching rockets, even efficiency gains of only a few percent are worth their weight in gold. Rockets could fly more cost effectively – or carry larger loads into space.
Research into such engines has been ongoing for a long time, but they are not yet ready for the market. The challenges are simply too daunting and too numerous.
Consider, for example, material loads and stress: The detonation waves travel through a ring chamber up to 20,000 times per second. At high frequency, the waves expose the material to extremely high pressure and very high temperatures.
Tests with RDREs have already been carried out in various countries. In the USA, NASA has ignited engines on a larger scale on ground-based test stands. A Polish institute has tested RDREs with liquid fuel. Japan is the only country to have actually ignited such an engine in space. So, if the Pegasus engine produces stable detonation waves for even a single second today, the team members will be able to count themselves among an elite group of genuine pioneers.

After two years of studies: just go for it

While his team colleagues pack the boxes for the test in the hangar, Mattia Röösli tells us how it all began.
He became interested in the subject early on. "Rockets fascinate me because they fly simply by accelerating fuel backwards. The principle is actually quite simple."
After two years of studying the basics, he was motivated by new territory: "There is no one who can tell you exactly how to do it because so much is still unexplored. Working at the forefront of research like this is pretty cool!"
The injector that Röösli has developed is a critical component. RDREs require highly precise injection technology that must mix and deliver the fuel in less than a millisecond, without the detonation wave reverberating back into the supply lines.
How do you approach such a task? He spent three weeks familiarising himself with the subject. Then he just got started. "Maybe I shouldn't have read so much," he says in hindsight. "It's a mistake to think you can fully understand the topic before you start. There are simply far too many unanswered questions."

Sketches, discussions, prototypes

So, he started with something higher-level: the question of which elements belong to such an injector and how they can be connected. "The first thing you do is make sketches and discuss them as a team. The others then draw your attention to things you have not yet considered. Then you continue calculating and sketching. You break big problems down into smaller ones until they become solvable."
The team gradually progressed to the first prototypes



Rotating Detonation Rocket Engines (RDRE) generate circular detonation waves. (Animation: Michelle Lehman, Oak Ridge National Laboratory, licensed under CC BY 2.0, via Flickr. Source: https://www.flickr.com/photos/olcf/50271465632/)



The engine and the test stand on the trailer were built here in the ETH hangar. (Image: Daniel Winkler / ETH Zurich)

from a metal 3D printer. "When the first prototypes are on the table, new challenges become apparent again." Röösli emphasises: "You don't need to be exceptionally talented to develop a rocket engine after two years of study. You go step by step and help each other."

The predecessors serve as coaches, and a start-up looks on

The expertise of the Aris project team was also very helpful last year – they pass on their knowledge year after year as coaches. If something goes wrong with one team, the next team benefits from this experience. A charred electronic component on a shelf of prototypes in the hangar bears witness to such a lesson.

Pegasus also benefited from the experience of the start-up located right next door, which is also working on RDREs. In any case, the infrastructure and the location in the ETH hangar in Dübendorf simplify many things. There are workbenches, 3D printers, ample space for materials, meeting rooms, workstations and plenty of room for testing right next to the large roller shutter door. Before an engine can be ignited for the first time, it undergoes a multitude of tests. These include flow tests with water or pressure tests. It is a long way to a controlled detonation, also due to the high safety standards that must always be adhered to. Colleagues spent several months working on the safety concept alone.
Today, the work of the whole team comes together for the second ignition, which is technically known as a "firing".

Gas cylinders, cable reels, snacks: check

Almost six hours earlier, at three o'clock in the afternoon, everyone gathered in the hangar for the safety briefing. All the equipment was already loaded onto handcarts, including cable reels, gas bottles, fire extinguishers and, importantly, a box of snacks to prevent the team from losing concentration due to hypoglycaemia at the airfield. Everyone stands in a circle. The test conductor reminds everyone of their roles, what must be observed and who is allowed to be where. Each person receives a coloured waistcoat to identify their role: blue for the test conductor, green for the safety officer, orange



Mattia Röösli opens the hangar. The test will take place at the Dübendorf airfield right next door. (Image: Daniel Winkler / ETH Zurich)



Test conductor Federico Vallejo instructs the team. (Image: Daniel Winkler / ETH Zurich)

for the engineers in charge and yellow for the so-called "DACS", the engineers responsible for data acquisition and control systems.
At four o'clock, Röösli opens the large roller shutter and hitches the trailer up with the high-tech test stand to an old, borrowed estate car. They drive to the neighbouring airfield at walking pace. After a short wait, two military policemen open the gate and wave the colourful procession through. Further back, a squadron of military helicopters is landing. Otherwise, there is not a soul to be seen, nor a car to be heard.
Everyone to their safe positions!

Once they arrive at the test site, the team immediately begins setting everything up. There should be as much time as possible for firings.
Ticking off a long checklist, the test leader guides everyone through the entire test sequence. Two people connect gas cylinders, while a little further away, others are setting up a flaring system to burn off excess propane.



Everything is executed strictly according to the checklist ... (Image: Daniel Winkler / ETH Zurich)



... and fire extinguishers are available at a safe distance. (Image: Daniel Winkler / ETH Zurich)

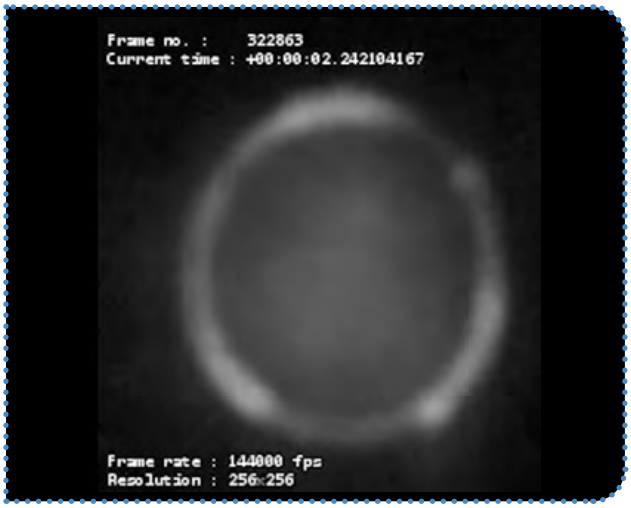
The colleagues in the mission centre operate each valve, while those at the test stand check whether they are working. This is followed by pressure tests. Finally, the engineers in charge, wearing thick gloves, aprons, special shoes and face shields, fill the valves with liquid oxygen. Ice crystals immediately form on the pipes.

The split second of truth

Then comes the moment everyone has been working towards. Everyone is fully focused on the screens in the hut. In the mission control, Mattia Röösli looks eagerly over his colleague's shoulder. It's just after seven o'clock, and it's already starting to get dark outside. The engineer at the mission control is handed the key by the security officer to activate the ignition power circuit. He flips a few switches and starts the cooling process for the engine on the computer. Then the moment has come: "Initiating firing sequence in 3, 2, 1, go!"
There is a hissing sound, a dull bang, followed by screeches in a hoarse, indefinable tone. The beam on the camera images then turns into a flame and goes out. Pressure is released and propane flares up at dusk in the flaring system.
Röösli and his colleagues exchange questioning looks. Was that a detonation wave? The students check the sensor data and discuss what they have seen and heard. Not really. So, everything starts from the beginning.

More propane

The team inspects the engine for damage and refuels with liquid oxygen. By now it's dark. Röösli studies the coloured curves on the screens to see how much propane and how much liquid oxygen flowed into the engine during the previous test. He pulls out a pen, does a quick calculation, then enters the parameter adjustments. The propane should flow a little earlier and a little longer before ignition.



Proof: the high-speed camera recorded three detonation waves. (Video: Robin Wyss / Aris Space) Via https://www.youtube.com/watch?v=KO5TxybfQQc



Success! Barbara Parys, Federico Vallejo and Robin Wyss watch the video recording of the test. (Image: Daniel Winkler / ETH Zurich)

At a quarter to nine, the engine is cooled to minus 130 degrees for the second time. 3, 2, 1, go!

This time, the pressure wave shakes the door of the small wooden hut and a long, steady stream of fire shoots out of the engine, again buzzing and whistling at the highest frequencies.
Röösli glances over his shoulder for a second, a hint of a smile on his face. Nobody says anything, but they all suspect it: that was a detonation wave.
Three detonation waves spark thrills and exuberance all around
Confirmation arrives later by radio, as the colleagues outside examine the video right next to the high-speed camera: "Yes! Guys, that was three detonation waves!" a colleague exclaims jubilantly into the radio. Congratulations all round before concentration returns to the preparations for the third firing.
Later, during dismantling, the excitement has subsided. Gen-Z slang replaces the monotonous mumbling over a checklist. Pride is written all over the students' faces.
Shortly before 10 p.m., Röösli gets behind the wheel of the old estate car towing the rocket engine trailer. He drives back to the hangar at a walking pace. Rap sounds out from the open window as if it were a summer evening, not a night with a cold north-easterly wind blowing at the beginning of April.
Two and a half hours later, the Artemis II mission lifts off from Kennedy Space Center in Florida, heading for the moon.

Focus Projects

The Focus Projects teaching format has been in place at the Department of Mechanical and Process Engineering at ETH Zurich for over twenty years. On 27 May 2026, 17 teams presented the prototypes they had developed over a year of intensive project work.

For more information please visit:
https://ethz.ch/news
https://ethz.ch/en/news-and-events/eth-news/news/2026/05/developing-a-rocket-engine-after-two-years-of-study.html

The contact for this article is Michael Walther, Corporate Communications at ETH Zurich

HYDRA aircraft concept takes first place in the DLR Design Challenge 2026

Deutsches Zentrum für Luft- und Raumfahrt
German Aerospace Center



Winning team from TU Berlin – their HYDRA concept won the DLR Design Challenge 2026

From left: Markus Fischer (DLR Divisional Board Member for Aeronautics), Tilo Hänsel, Aaron Allen, Vitus Reick, Fabian Kerskes and Philipp Riedel. © DLR. All rights reserved

- Sixteen student teams have developed concepts for a small aircraft to serve as a flying testbed.
- The aircraft are intended to test new aviation technologies under real-world conditions and investigate how they work together.
- The team from the Technical University of Berlin won the DLR Design Challenge 2026 with its HYDRA concept.
- Focus: Aeronautics, young talent

The jury of the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) has awarded first place in the tenth DLR Design Challenge to the team from the Technical University of Berlin (TU Berlin) for its HYDRA concept. At the closing event on 20 August 2026 at DLR's site in Hamburg-Finkenwerder, 16 student teams presented their designs to a panel of experts.

The task was to develop an entirely new small aircraft that can serve as a flying testbed for future aviation technologies. The aircraft had to be designed with enough practical relevance that it could realistically be built and tested within the next few years.

To advance the market readiness of technologies for use in commercial airliners starting in 2050, the students were tasked with designing a flexible research platform that would allow different technologies to be investigated under real flight conditions. This meant first identifying relevant future technologies, then considering how testing them on the aircraft could provide added value. A modular design was intended to make it possible to test different systems and propulsion types with as little effort as possible.



"The competitiveness of the aviation industry in Germany and Europe depends crucially on quickly bringing new technologies from research into practical application. Flying testbeds make it possible to test innovative technologies at an early stage, at a high system level and under real-world conditions. At the same time, we need highly trained young professionals who can develop these technologies and put them into practice. My thanks and congratulations go to all the students, as well as to the organising team, for their great commitment and the outstanding, innovative concepts produced by the design teams."

Markus Fischer, DLR Divisional Board Member for Aeronautics

Three teams honoured

First place went to the TU Berlin team with HYDRA. The jury was particularly impressed by the synergistic selection of technologies. The modular, interchangeable powertrain allows for rapid conversion between different configurations, resulting in a well-thought-out concept that enables the timely testing of relevant aviation technologies.

Second place went to the TU Braunschweig team with KANGAROO. Their design is characterised in particular by its focused testing of hydrogen propulsion systems at high altitudes and the associated challenges.
Third place went to the RWTH Aachen University team with HYDRA-X. The concept places particular emphasis on holistic aircraft design methods, and the team's captivating presentation won over the jury.

From the test bench to the skies

A key challenge in developing new aviation technologies is the transition from laboratory and ground tests to real flight operations. This is due to technical, regulatory and economic hurdles. In aviation in particular, development, certification and testing cycles are long and complex. Flying testbeds can bridge the gap between research and later application, enabling technologies to be tested in combination, measurement data to be collected under real operating conditions and technical risks to be identified at an early stage.

The requirements were based on a realistically feasible research aircraft with sufficient space for measurement equipment and flight test personnel.

Expertise, creativity and team spirit

The 16 teams had approximately four months to develop their concepts, adhering to a design process modelled on the development of real aircraft. For the first time, experienced DLR specialists were on hand to offer guidance as mentors. The DLR Design Challenge was jointly organised by the DLR Institute of System Architectures in Aeronautics and the DLR Institute of Aerodynamics and Flow Technology.



"The Design Challenge illustrates very clearly what modern aircraft design is all about: a good solution does not come from individual innovative technologies, but from the interplay of aerodynamics, propulsion, systems, structure and operations within the overall system. Students must understand and evaluate these interrelationships and use them to develop a coherent concept. It is precisely this systems-based thinking that is crucial if we want to shape the aviation of tomorrow."

Björn Nagel, director of the DLR Institute of System Architectures in Aeronautics and member of the jury

Next steps

The three top-ranked teams will go on to present at the German Aerospace Congress 2026 in Aachen. The winning team will also present its design at the European Aerospace Science Network Conference (EASN 2026) in Toulouse.

The Design Challenge thus combines testing new technologies with promoting the next generation of scientists and engineers – two key prerequisites for a competitive aviation sector of the future.

HYDRA is a fundamentally new concept for a demonstrator aircraft for future hydrogen aircraft technology, enabling the experimental validation of hybrid-electric propulsion systems under real flight conditions. Thanks to a modular architecture with interchangeable powertrain containers, fuel cells and turboshaft engines with generators can be quickly swapped within a single working day. The shared airframe uses liquid hydrogen (LH_2) as the primary energy source, batteries as supporting storage and electric motors as part of the Distributed Electric Propulsion (DEP) concept, including a wingtip propeller to improve aerodynamics. The modular design allows flight tests to be conducted close to the aircraft's performance limits – in particular to investigate performance dynamics and thermal management – and serves to validate theoretical models as well as inform the development of future certification criteria. HYDRA therefore forms a central platform for the research and development of sustainable, emission-free aviation technologies.



Credit: TU Berlin/HYDRA

For more information please visit:

https://www.dlr.de/en/latest/news/2026/hydra-aircraft-concept-takes-first-place-in-the-dlr-design-challenge-2026
The contact for this article is Jana Hoidis.

Outline of the latest issues of the **CEAS Aeronautical journal** and the **CEAS Space Journal**

The **CEAS Aeronautical Journal** and the **CEAS Space Journal** were created under the umbrella of CEAS to provide an appropriate platform for excellent scientific publications submitted by scientists and engineers. The German Aerospace Center (DLR) and the European Space Agency (ESA) support the Journals, which are published by Springer Nature. Both Journals publish peer-reviewed original articles, review articles and short communications.

The **CEAS Aeronautical Journal** is dedicated to publishing results and findings in all areas of aeronautical science and technology as well as new developments in digital design and manufacturing of aircraft, rotorcraft, and unmanned aerial vehicles. A key aspect of growing importance is the mitigation of the aviation-related climate impact. NEW: **Journal Impact Factor: 2,4 (2025)**

The **CEAS Space Journal** is devoted to excellent new developments and results in all areas of space-related science and technology, including important spin-off capabilities and applications as well as ground-based support systems and manufacturing advancements. Disciplines of interest include all those that reflect consolidated and new technologies and requirements that stem from new applications of space assets. Journal Impact Factor: 1,8 (2025)

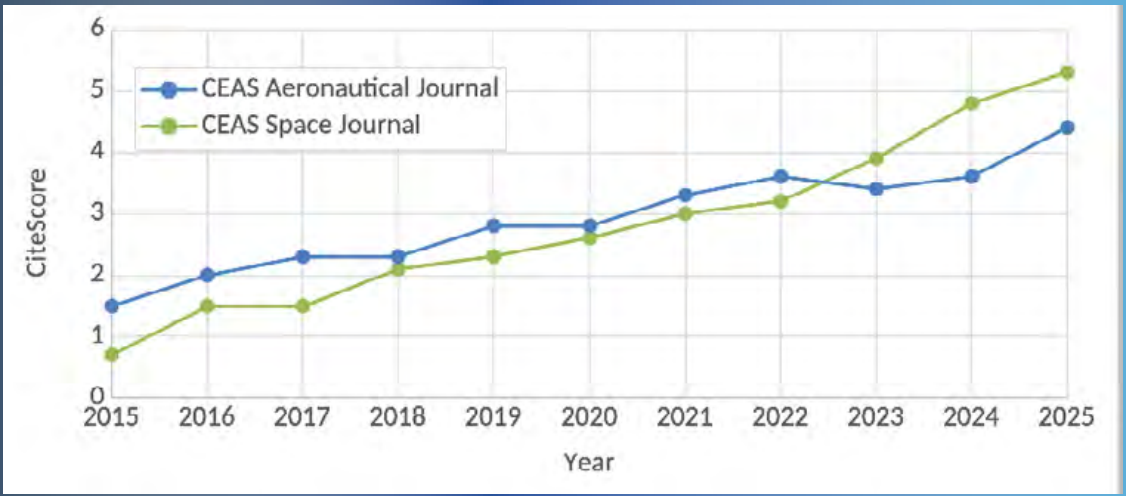
Both journals are indexed in Scopus and Web of Science. **We invite you and your colleagues to contribute to the further development of these journals by submitting the results of your excellent research for publication, as well as acting as reviewers. If you are interested in becoming an associate editor, please contact the relevant Managing Editor:**

- ***For the CEAS Aeronautical Journal:***
cornelia.hillenherms@dlr.de;
https://link.springer.com/journal/13272;
- ***For the CEAS Space Journal:***
andrea.dieball@dlr.de;
https://link.springer.com/journal/12567.

A list of articles published in the latest issues of both CEAS Journals is attached.

The Managing Editors:

- Andrea Dieball
- Cornelia Hillenherms
- Wilhelm Kordulla
- Janko Kreikemeier
- Johan Steelant



CEAS SPACE JOURNAL



Volume 18, Issue 5, September 2026

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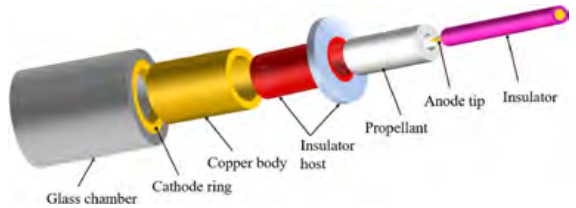

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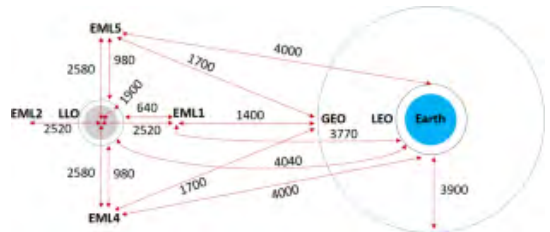

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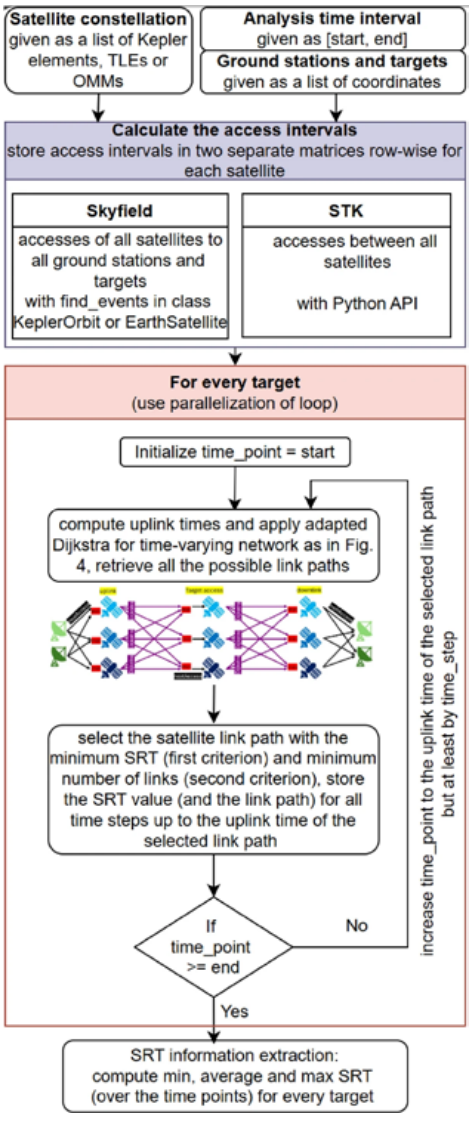

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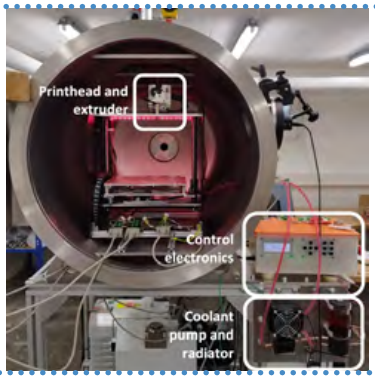

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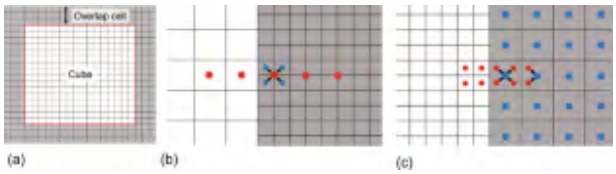

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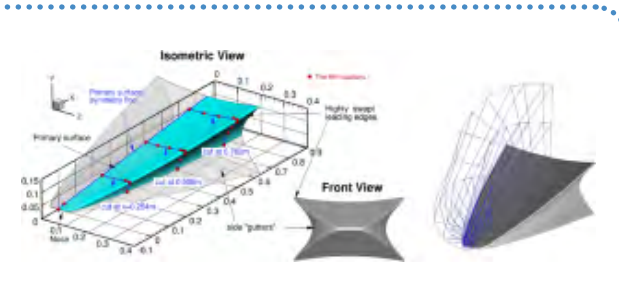

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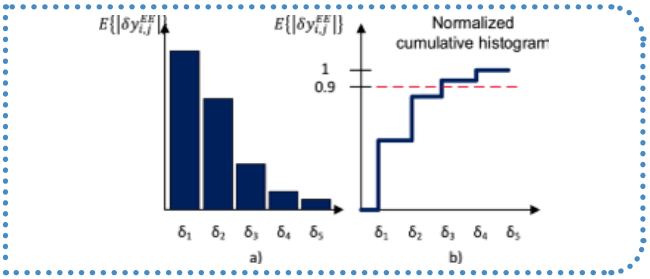

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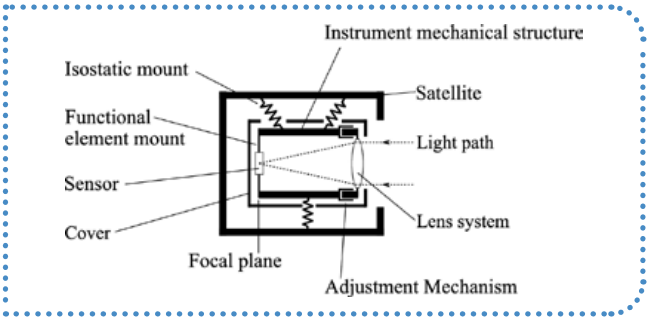

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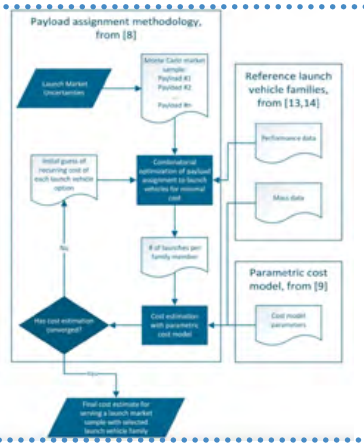

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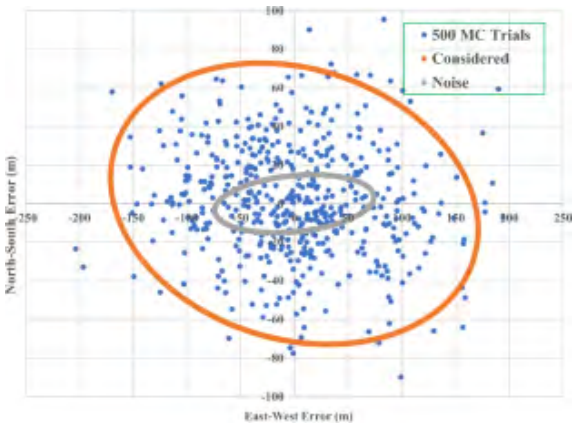

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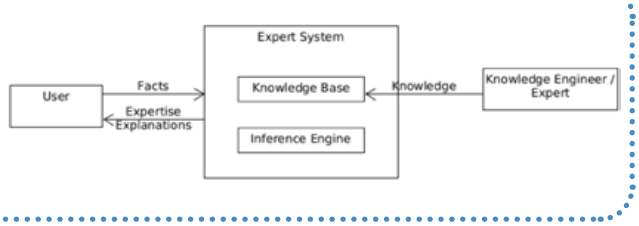

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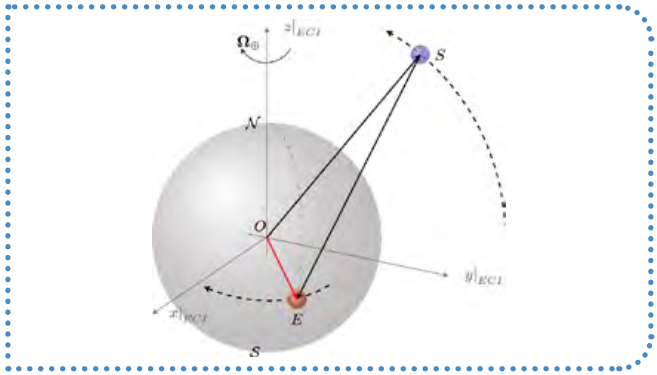

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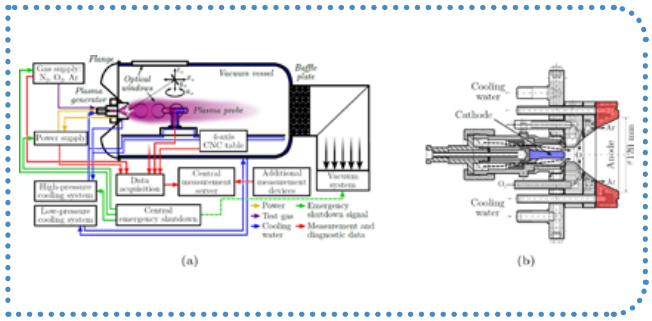

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UPCOMING AEROSPACE EVENTS

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NOVEMBER

- **2 – 4 November 2026** / ICGA 2026 – The 4th International Conference on Green Aviation, Xi'an, China
- **4 – 5 November 2026** / International Conference on Aerospace and Aviation Engineering (ICAAE), New York, USA
- **10 – 15 November 2026** / Airshow China, Zhuhai, China, https://www.airshow.com.cn/en/

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- **1 – 3 December 2026** / European Rotors 2026, Lyon, France, https://europeanrotors.eu/
- **9 – 10 December 2026** / GAD World (Global Airport Development), Milano, Italy

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- **11 – 15 January 2027** / AIAA SciTech Forum 2027, Orlando, https://scitech.aiaa.org/
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- **26 – 27 January 2027** / 19th European Space Conference, Brussels, Belgium

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- **22 February 2027** / 9th Workshop on Avionics Systems and Software Engineering (AvioSE) in Dortmund, Germany, https://aviose-workshop.github.io/

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- **6 – 13 March 2027** / IEEE Aerospace Conference, Big Sky, Montana, USA
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- **22 – 23 March 2027** / International Conference on Aeronautics and Aeroengineering (ICAA), Prague, Czech Republic

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- **14 – 17 April 2027** / AERO Friedrichshafen, Friedrichshafen, Germany
- **April 2027** / The 17th EASN International Conference, University of Cyprus, Cyprus

MAY

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- **23 – 28 May 2027** / 5th HiSST International Conference on High-Speed Vehicle Science and Technology, Beijing, China

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- **7 – 11 June 2027** / AIAA AVIATION Forum 2027, San Diego, https://aviation.aiaa.org/
- **14 – 20 June 2027** / 56th Paris Air Show, Paris-Le Bourget, France https://www.siae.fr/en/
- **21 – 23 June 2027** / International Conference on Aerospace Structures, Structural Dynamics, and Materials - IASDM 2027, Rome, Italy
- **24 – 26 June 2027** / The World Summit on Aerospace and Aeronautical Engineering (AERO2027), Amsterdam, Netherlands
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- **20 – 24 September 2027** / 28th International Society for Air Breathing Engines (ISABE) Conference, Querétaro, México, https://www.isabe.org/

- **27 Sept – 1 October 2027** / International Astronautical Congress IAC 2027, Poznan, Poland

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- **15 – 19 November 2027** / Dubai Airshow, Dubai, UAE https://www.dubaiairshow.aero/en/

- **29 November - 2 December 2027** / 11th CEAS Aerospace Europe Conference, Augsburg, Germany, https://aec2027.dglr.de/

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- **10 – 14 January 2028** / AIAA SciTech Forum 2028, Orlando, Florida, USA

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- **11 – 14 September 2028** / ICA 2028 / Forum Acusticum 2028, Funchal, Madeira, Portugal

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NOVEMBER

- **15 – 17 November 2026** / Bahrain International Airshow, Bahrain


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