



NEWSLETTER 01 | 2026

PLEIADES has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101192721.



**Funded by
the European Union**

TECHNICAL UPDATES

PLEIADES VALIDATION STRATEGY: DUAL INDUSTRIAL CASES

Instead of testing innovation in a single environment, PLEIADES project takes a different approach. Technologies are demonstrated across a small aircraft manufacturer (Evektor) and a large aerospace industry leader (Collins Aerospace).

Validation under both resource-constrained and highly controlled

industrial conditions. Increased technology readiness through complementary testing environments. Strengthened transferability across the aerospace value chain.

This dual validation ensures scalable solutions and reliable integration into diverse industrial settings.



TRANSITION TO FULL-SCALE DASHBOARD DEMONSTRATOR

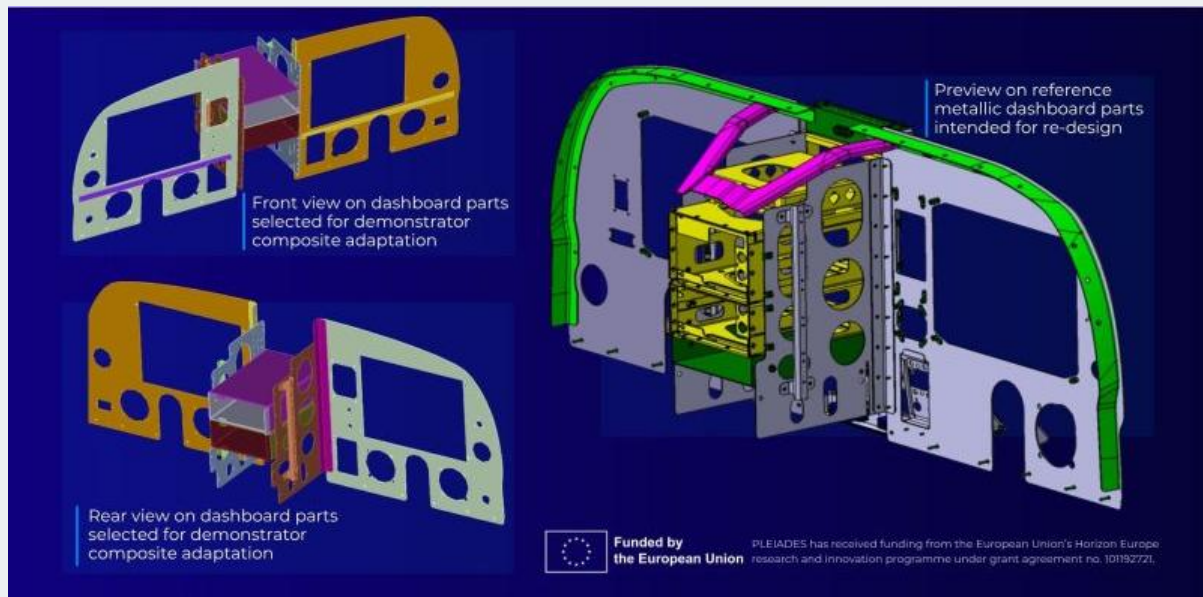
Within PLEIADES project, the development of a composite-based cockpit dashboard for the VUT100 aircraft has evolved to support more robust validation.

The demonstrator was initially defined at a 1:2 scale. However, early assessments identified key limitations:

- Non-representative load conditions
- Deviations in structural behaviour
- Reduced validation capability

The project transitioned to a full-scale physical demonstrator, which enables realistic testing conditions, more reliable validation of materials and design as well as better alignment with real aircraft integration without increasing overall project costs.

This approach enhances technology readiness and supports reliable assessment under realistic conditions.



SMARTER AIRCRAFT ICE PROTECTION SYSTEMS WITH PLEIADES

Conventional electric-based Ice Protection Systems (IPS) typically operate using predefined heating sequences and fixed power allocation, limiting their adaptability under dynamic flight conditions.

Within PLEIADES project, Collins Aerospace is investigating a next-generation approach based on the integration of PIC and FBG photonic sensors into IPS architectures.

This enables real-time thermal monitoring, feedback-driven power control and improved energy efficiency. Transition towards adaptive system operation supports reduced energy consumption, enhanced operational efficiency and contribution to more sustainable aviation.

Beyond ice protection, the same technology enables Structural Health Monitoring (SHM) and damage detection.



1 From static heating to intelligent IPS

CONNECTING NDT and SHM FOR SMARTER AEROSPACE STRUCTURES

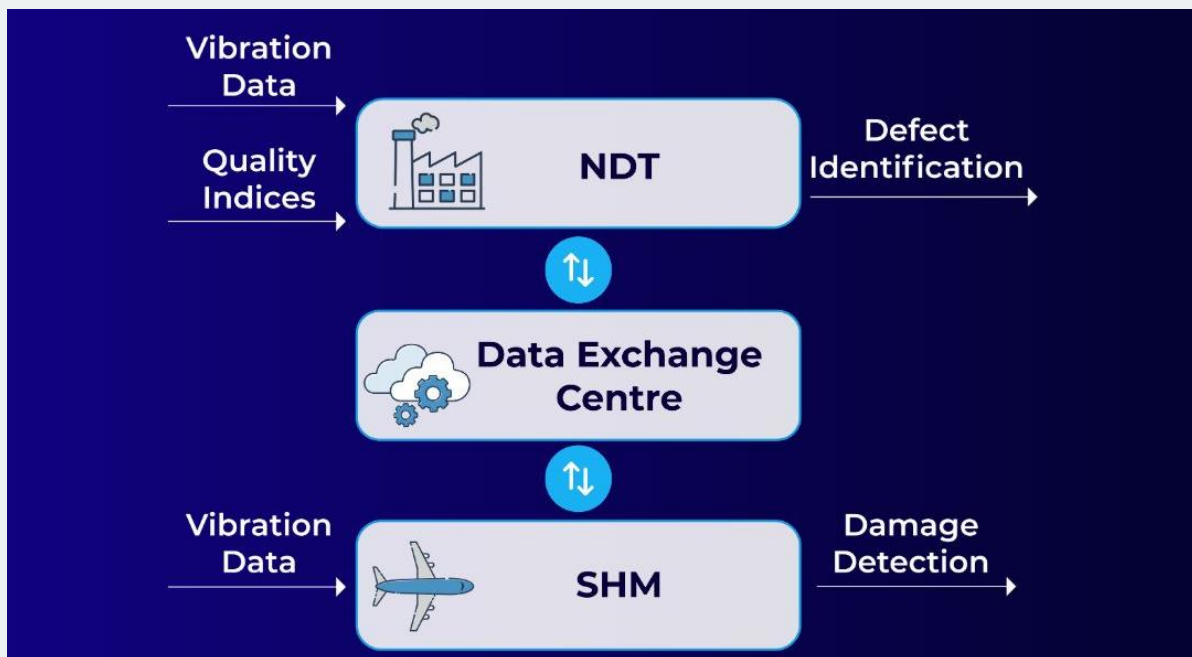
One of the key developments in PLEIADES is the creation of a unified NDT-SHM framework. Instead of treating inspection and monitoring separately, the project connects NDT (manufacturing phase), SHM (in-flight operation) and the maintenance and repair processes:

- NDT detects and characterizes defects using vibration-based data
- SHM monitors structural integrity in real time
- A cloud-based data exchange center links both

The key innovation: SHM uses part-specific data from NDT, improving reliability under real conditions.

The impact:

- More accurate damage detection
- Reduced uncertainty in composite structures
- Smarter, data-driven maintenance decisions
- Moving toward data-driven lifecycle monitoring in aerospace



2 Interconnected NDT-SHM framework

AUTOMATED INDUCTION WELDING FOR AEROSPACE COMPOSITES

In PLEIADES project, we're developing robotic induction welding to enable reliable joining of thermoplastic composite structures.

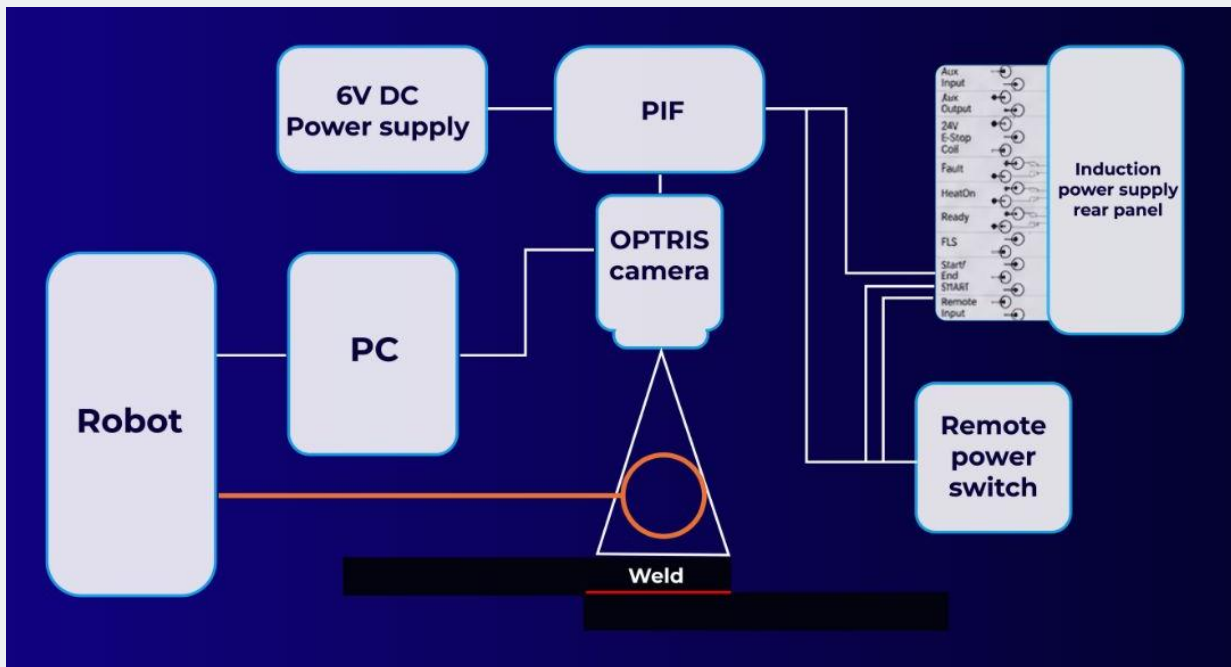
A redesigned aircraft dashboard demonstrates the approach, replacing metallic parts with lightweight composites and validating welding across complex geometries.

The process combines KUKA KR 50 R2100 robot, Ambrell EASYHEAT 8310

induction system and Optris PI400i thermal monitoring.

Focus areas include joint strength & durability, process repeatability and heat uniformity.

Our goal is to support the development of scalable and high-quality composite manufacturing processes for aerospace applications.



3 Automated induction Welding

LEARN MORE IN OUR [TECHNICAL BROCHURE](#) ABOUT INDUCTION WELDING



EVENTS

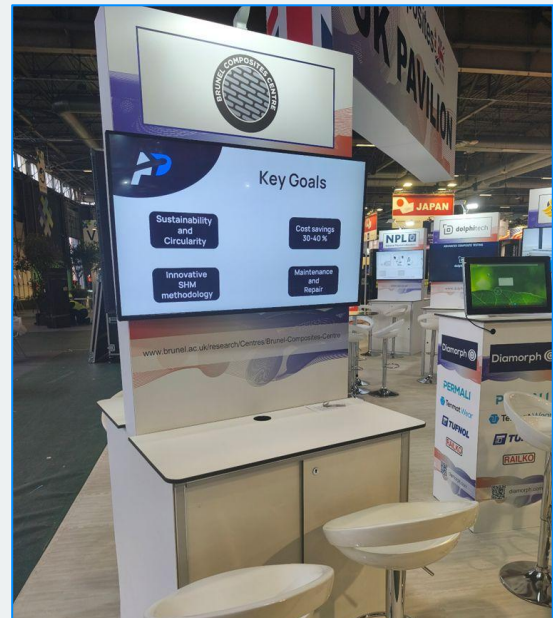
PLEIADES AT JEC WORLD 2026

PLEIADES partner Brunel Composites Centre (BCC), successfully showcased the PLEIADES project at this year's JEC World (March 11–12).

Our team engaged with a wide range of visitors from across the composites industry—presenting the project's goals, exchanging ideas, and exploring future opportunities.

The stand featured a looping video presentation and informational leaflets, helping to bring PLEIADES to life for attendees.

Events like JEC World are key to strengthening collaboration, increasing visibility, and connecting innovation with industry needs.



PLEIADES AT CLEO 2026

Thenia Prousalidi from PCRL - Photonics Communications Research Laboratory / National Technical University of Athens represented the PLEIADES project at CLEO Conference with a presentation on advanced silicon photonic sensing technologies for aerospace-grade

composite manufacturing.

The presentation was entitled: "Silicon Photonic Sensors for Aerospace-grade Composite Manufacturing using self-heating Composite tools".

This work demonstrates a packaged silicon photonic sensor for monitoring aerospace-grade RTM composite manufacturing, achieving reliable operation above 100 °C, strong thermo-optic response and high sensitivity, low optical loss as well as stable

performance across multiple heating cycles.

These developments highlight the potential of integrated photonic sensing technologies for smarter, more reliable and scalable industrial manufacturing environments.



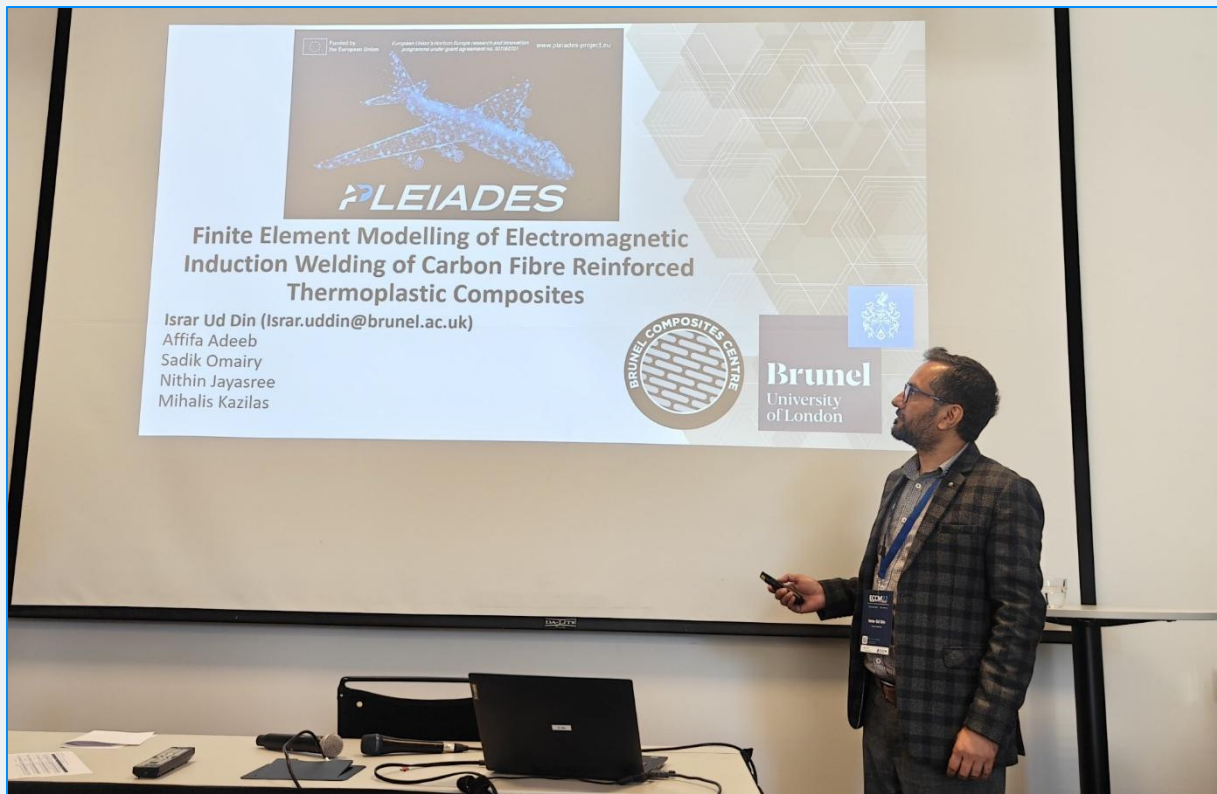
TWO PLEIADES PRESENTATIONS AT ECCM22

Dr. Israr Uddin from Brunel Composites Centre (BCC) was at the 22nd European Conference on Composite Materials (ECCM22) in Oslo (Norway) and presented his work on “Finite element modelling of electromagnetic induction welding of carbon fibre reinforced thermoplastic”.

Electromagnetic induction welding is a promising joining technology for advanced composite structures. However, identifying the optimum processing conditions often requires extensive experimental trials, which can be both time-consuming and costly. Through advanced multiphysics finite

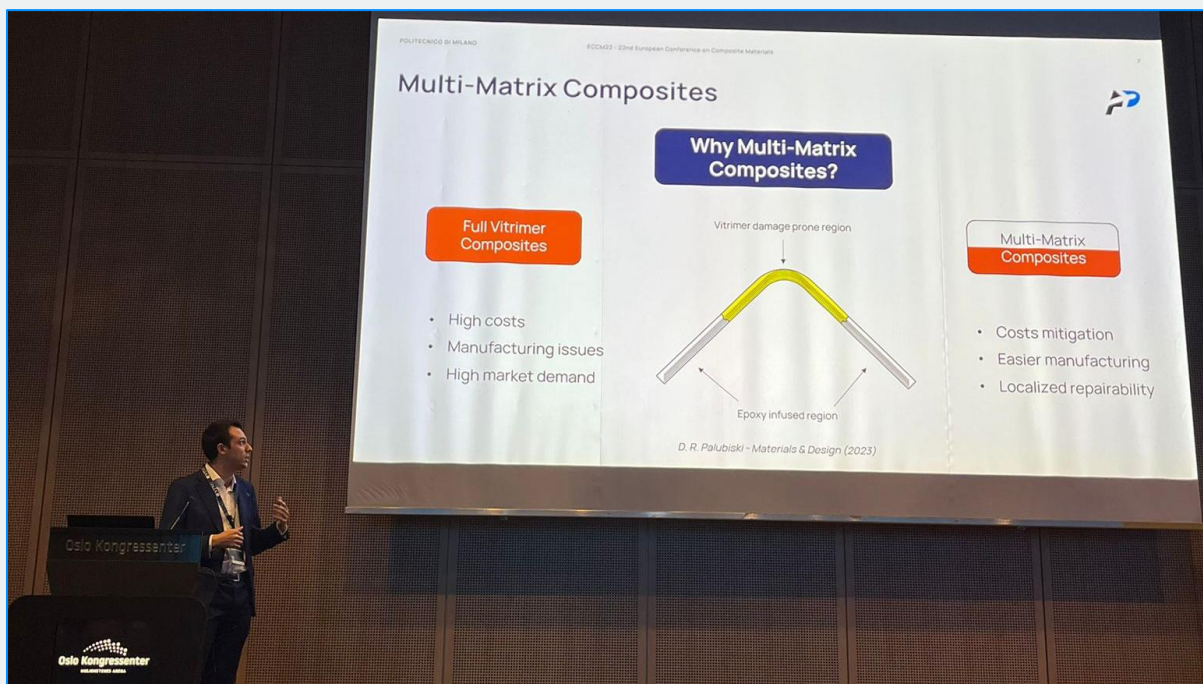
element modelling, it is possible to predict the coupled electromagnetic, thermal, and material responses during the welding process, enabling the determination of an optimum processing window while significantly reducing experimental effort and associated costs.

The talk showcased the detailed development of an advanced multiphysics model developed for the PLEIADES project, highlighting the modelling methodology, key challenges, and insights gained in simulating the electromagnetic induction welding process.



Lorenzo Di Marco from Politecnico di Milano presented his latest research as well: his presentation explored innovative approaches to understanding and repairing delamination damage in epoxy-vitrimer multi-matrix composites.

By improving the repairability and lifetime of advanced composite materials, this work contributes to more durable and sustainable engineering solutions for high-performance applications.



FIND BOTH PRESENTATIONS IN OUR [WEBSITE REPOSITORY](#)



PLEIADES

PLEIADES AT EWSHM 2026

PLEIADES partner Collins Aerospace contributed to the 12th European Workshop on Structural Health Monitoring (EWSHM 2026) in Toulouse, France, one of Europe's leading conferences dedicated to innovations in Structural Health Monitoring (SHM).

During the conference, two presentations showcased research related to advanced structural health monitoring for ice protection composite laminates.

Dr. Saheed Ojo presented:
"An efficient multiparametric methodology for damage prognostics



and SHM of ice protection composite laminates"

Dr. Sindhu Bushpalli presented:
"An electro-thermo-mechanical beam model for structural health monitoring of new ice protection laminate"

Both contributions, co-authored by Saheed Ojo, Sindhu Bushpalli, Vasilis Tsachouridis, Majid Bhinder, Stylianos Basagiannis, and El Hassan Ridouane, highlighted ongoing research supporting the development of smarter, safer, and more reliable composite structures for future aerospace applications.



VISIT OUR [REPOSITORY](#) TO DOWNLOAD THE PRESENTATIONS



Giannis Pouloupoulos (PCRL – Photonics Communications Research Laboratory) also gave an oral presentation at EWSHM, titled “Optical Sensing for Composite Aerostructure Manufacturing and Structural Health Monitoring: A Temperature-Demonstrated, Pressure-Capable Silicon Bragg Grating Platform”.

The presented work introduced a compact silicon photonic integrated circuit sensing platform for the monitoring of composite aerospace structures during both manufacturing and operation. The proposed platform combines the advantages of photonic sensing — such as immunity to electromagnetic interference, robustness in challenging environments and compatibility with existing fibre-optic sensing solutions — with the scalability and miniaturisation offered by photonic integrated circuits.

The sensing element is based on a 220 nm silicon-on-insulator platform, using

corrugated waveguides that act as phase-shifted Bragg gratings. The device is optically coupled to a single-mode fibre through a micro-ball-lens interface, forming a miniature, passive sensor that operates purely with light. Experimental results demonstrate a temperature sensitivity of approximately 85 pm/°C, high linearity and reliable performance up to 180 °C, while the platform is designed to support pressure sensing and multiparameter monitoring within composite materials.

This work highlights the potential of integrated photonic sensors as compact, scalable and high-resolution solutions for Structural Health Monitoring and the manufacturing of next-generation aerospace composite structures.

The presentation was based on the paper “Integrated Photonic Multisensors for Structural Health Monitoring and Manufacturing of Composite Aerospace Structures”.

DOWNLOAD THE PRESENTATION AND THE PAPER ON OUR [WEBSITE](#)



PLEIADES RP1-MEETING IN BRUSSELS

On Tuesday, 14 July 2026, our consortium came together for the RP1 Meeting in Brussels (Belgium), where we had the opportunity to present the progress achieved during the first reporting period and discuss the next steps with our Project Officer Dr. Georgios Bampanis.

These meetings are an important milestone—not only to reflect on what

has been accomplished, but also to exchange ideas, address challenges, and align on the path ahead.

A big thank you to all project partners for the productive discussions, valuable feedback, and continued collaboration. Looking forward to the next phase of the project and the innovations we'll achieve together!



CLUSTER ACTIVITIES

PLEIADES IS PART OF THE ATLAS CLUSTER

The ATLAS Cluster brings together five Horizon Europe-funded projects under the topic HORIZON-CL5-2024-D5-01-08, forming a coordinated effort to accelerate innovation in aircraft materials, manufacturing processes, and certification methodologies. Created in response to a shared challenge within the European aviation ecosystem, the cluster fosters collaboration, knowledge exchange, and alignment across complementary research initiatives.

As the aviation sector moves toward climate neutrality, it faces increasing demands for lighter, stronger, and more sustainable materials, alongside faster and more reliable certification pathways. The ATLAS Cluster addresses these challenges by combining expertise in

advanced materials, digital modelling, process optimisation, and testing frameworks.

Together, the five HE-funded projects work toward a common goal: to enable safer, more efficient, and more sustainable aircraft through integrated digital and physical innovation across the entire development lifecycle. By aligning methodologies and sharing insights, the cluster strengthens the impact of each individual project while contributing to a more cohesive European research landscape.



[READ MORE ABOUT THE CLUSTER AND ITS PROJECT HERE](#)



INVITATION TO ATLAS CLUSTER JOINT WORKSHOP

We warmly invite you to “Wings of Change: Navigating the Future of Sustainable Aerostructures”, the first joint workshop bringing together Horizon Europe projects CompSTLar, TOSCA, PLEIADES, pAlramid and HyperMorphH, collaborating to accelerate the transformation of aerospace composites and shape the next generation of lightweight, sustainable aircraft.

The workshop will cover the entire value chain of sustainable aerostructures – from novel recyclable materials and automated manufacturing, through digital twins, AI and virtual certification, to next-generation aircraft concepts.

Through expert presentations and interactive discussions, participants will engage with the breakthroughs that are reshaping European aviation.

The workshop is designed as an in-person event in Zaragoza. Should travelling not be possible, an online attendance option is also available.

From PLEIADES side, Harry Zervos (ICCS, NTUA) will speak about how photonic technologies enable smarter composite manufacturing.



FIND MORE INFORMATION, THE AGENDA AND REGISTRATION [HERE](#)

