

## about caelestis

Adopting a new breed of aircraft is essential for reaching climate neutrality by 2050.

Decisive improvements in aircraft performance are going to be vital if we are to reduce emissions safely and viably in the future. According to the aeronautics community, virtual prototyping has the biggest potential to be the key enabling technology in achieving these objectives and making zero carbon aviation a reality.

CAELESTIS will develop a new interlinked system able to execute massive calculations and predictions across the aviation value chain. Digital twins will then be developed with unprecedented levels of detail covering manufacturing effects and deviations.



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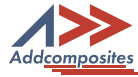
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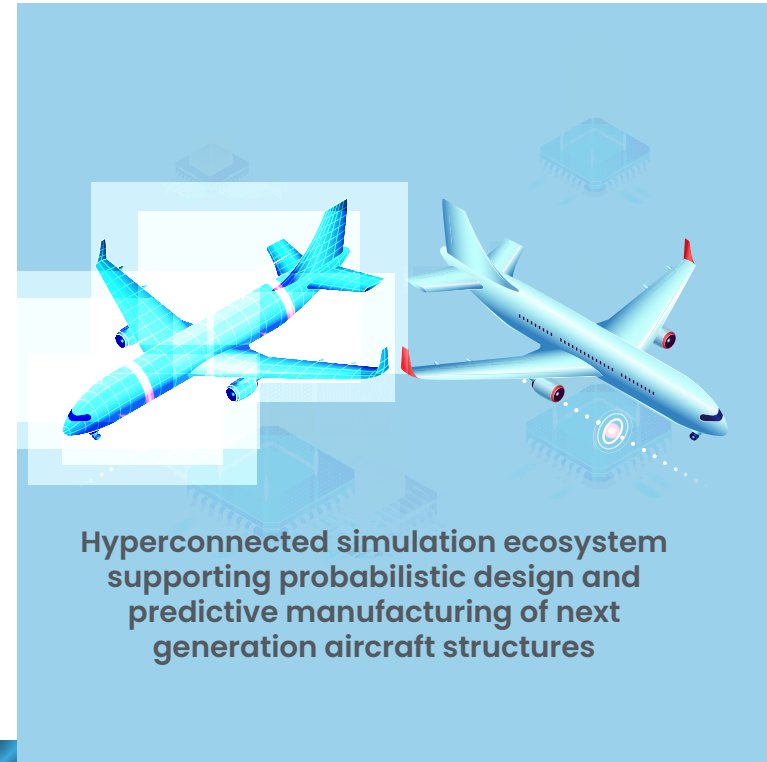
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## partners

11 partners operating in 8 EU countries are collaborating in the CAELESTIS project consortium.



Our expertise spans a variety of technical sectors, from aeronautics or supercomputing, from additive & automated manufacturing to cybersecurity and communications.



**Hyperconnected simulation ecosystem supporting probabilistic design and predictive manufacturing of next generation aircraft structures**

## contacts

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**Looking towards climate-neutral and environmental-friendly aviation through clean and smart technical solutions and innovation.**



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## research

Accelerating the reduction of all aviation impacts and emissions is going to require speeding up the development of aircraft technologies, making disruptive efficiency gains by 2035.

The research to be undertaken throughout the life cycle of CAELESTIS brings together a multitude of disciplines and areas of research. Our chief aim is to develop a robust and secure digital ecosystem, utilizing simulation-driven design to innovate a new manufacturing methodology able to transform the European aircraft industry – and reduce emissions along the way.

- Digital Twins
- Interoperable Simulation Ecosystem (ISE)
- Predicting Manufacturing Defects
- Generative Structural Design
- Machine Learning

## impact

The technical outcomes of CAELESTIS could have huge potential impacts for the EU's aviation industry, environment, and European society in general.

Disruptive efficiency gains could reduce fuel burn in the long run by up to 30%, while the innovation enabled by CAELESTIS could help SMEs and startups to better operate within a streamlined, market-oriented environment.

Additionally, the impact of CAELESTIS could create more and better jobs, accelerate digitalisation and generate inclusive growth contributing to the European Green Deal and a Europe fit for the digital age, with a renewed economy that works for the people.

- Reduction of design and qualification times
- Reduction of the overall weight of aircraft components
- Reduction in the manufacturing cost
- Reduction in the number of scraps and reworks



## facts & figures



3.8%

CO<sub>2</sub> emissions stemming from aviation in the EU



50%

Projected increase in emissions by 2050



\$2.6 Trillion+

Potential market from disruptive innovation in EU aeronautics until 2050



30%+

Potential reduction in fuel burn and CO<sub>2</sub> emissions from aircraft



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