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# SPACE CRITICAL TECHNOLOGIES FOR EU NON-DEPENDENCE

**SUPPORTING THE  
DEVELOPMENT**

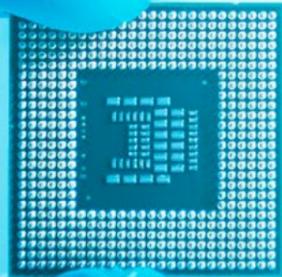
OF CRITICAL SPACE COMPONENTS,  
SYSTEMS AND TECHNOLOGIES



Horizon Europe,  
a programme of the  
European Union



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# SPACE CRITICAL TECHNOLOGIES FOR EU NON-DEPENDENCE

Supporting the development of critical space components, systems and technologies

## About space technology non-dependency and why it is so crucial for the European space industry

Space is a strategic sector for the economy as well as for EU's security and defence. It increasingly represents an invaluable asset in many sensitive and high-stakes matters. Europe needs to master certain space technologies to be non-dependent from other parts of the world. This is why the European Commission is focussing part of the space research programme on the **development of critical space technologies**, with the objective to allocate €20 million on a yearly basis.

## Towards the future:

What are the next steps to achieve non-dependency?

Europe will further **prioritise the critical technologies** needed to achieve non-EU dependency and secure their supply chains. These technologies are focused on space Electrical, Electronic and Electro-mechanical (EEE) components, such as Radio Frequency (RF) and Power components, GaN based components, passive components, photonics components, SoCs (system on chip), microelectronics based on advanced technology nodes, very high-speed serial interfaces, and also include e.g. solar cells for space applications, advanced assemblies, PCB (Printed Circuit Board), large deployable structures and antennas and space-qualified carbon fibre material sources for launchers and satellite subsystems.

With the support of the Horizon funding programme, many critical space technology projects have increased technological readiness levels (TRL), allowing products to reach the space market. With Horizon Europe, over 2021-2027, the European Commission will **enhance its support to the development of critical space technologies** for European non-dependence.

The European Commission closely cooperates in this field with the European Space Agency and the European Defence Agency through a Joint Task Force.



### Boosting innovative R&I

Funds in the order of €55 million have been provided under Horizon Europe for targeted and strategic actions supporting the EU space sector



### Boost space

Produce fundamental measures that are required to sustain the five strategic capabilities, ensuring growth of the economy competitiveness, foster competitiveness and accelerate the pace of innovations, support EU non-dependency on critical technologies and strengthen international cooperation



### Supporting EU objectives

By ensuring a globally competitive and non-dependant European space sector

## Current efforts and achievements

toward an autonomous European space industry

Space-grade electronic devices and other space systems are often subject to restrictive trade rules, such as the US International Traffic in Arms Regulations (ITAR). To be non-dependent, the EU should develop its **own domestic production of critical technologies**. Significant areas of R&D, evaluation/qualification and EU investments in the last years include:

- Funding the design, manufacturing, validation space qualification of the first EU radiation-hardened families of FPGAs (field programmable gate arrays). The first EU space qualified FPGAs have now been inserted in EU space missions like Galileo, Copernicus. New developments are on-going for paving the way toward the next EU FPGA based on 7nm.
- Establishing of the first EU high energy (up to GeV/n) heavy ion accelerator serving the space sector. The European Commission is building two facilities which will be crucial for high-density, advanced EEE components.
- Establishing a European supply chain for offering normally-off GaN (Gallium Nitride) devices for space applications including power conversion covering both low voltages (<50V) and high voltages of up to 650V.
- Creating advanced high dissipative packages with high thermal dissipation based on diamond and high dissipation with large pin count have been developed and evaluated for space.
- Developing of the first EU-developed radiation-hardened by design high density non-volatile memory magnetic RAM (MRAM) based on a European FDSOI process and 3D stacking.

These efforts will boost European competitiveness and non-dependency especially in space electronics, as well as improve resilience of space-related supply chains and technological performance.

## Introducing current space R&I projects

Horizon Europe projects

**Project SGAN-Next** aims at maturing the EU based 100nm GaN on SiC MMIC foundry process for high frequency operations (up to Q-Band) and perform a formal space qualification.

**Project STEP** is providing a full European supply chain focused on the design and manufacturing of competitive and affordable large format T2SL eSWIR FPAs, which can drastically boost the observational capabilities of space IR payloads.



### Be part of the EU-funded space R&I

Horizon Europe is the EU's key funding programme for research and innovation, with a budget of around €95 billion over 2021-2027, of which close to €1.6 billion is dedicated to space research. Critical Space Technologies for EU non-dependence projects are implemented through a dedicated topic of the Space R&I work programme and managed directly by the Commission, through the executive agency **Health and Digital Executive Agency (HaDEA)**. Calls are published on the **European Commission Funding and Tenders participant portal**.

