CASSINI
Hackathons & Mentoring

Introducing the CASSINI Hackathon Space for Defence & Security – Bulgaria edition

24-26 March 2023

Local Organiser: **RST** Risk Space Transfer Office (RST-TTO) - Bulgarian Academy of Sciences

Implemented by

VERHAERT | MASTERS IN INNOVATION   **space·tec** PARTNERS

The CASSINI initiative & EU Space programme

The European Commission launched the **Competitive Space Start-ups for Innovation initiative (CASSINI)** in 2021 as a part of broad effort in support of space entrepreneurship for a digital and sustainable Europe.

Launched March 2021, the CASSINI Hackathons & Mentoring

is the first flagship action.

Earth observation

Copernicus is the European Union's **Earth observation programme**, looking at our planet and its environment to benefit all European citizens.

Satellite navigation

Galileo is Europe's **Global Navigation Satellite System** (GNSS), providing improved positioning and timing information with significant positive implications for many European services and users.

The European **Geostationary Navigation Overlay Service** (EGNOS) is Europe's regional satellite-based augmentation system (SBAS) that is used to improve the performance of global navigation satellite systems (GNSSs).

Secure connectivity

The European Union **Governmental Satellite Communications** (GOVSATCOM) programme provides secure and cost-efficient communications capabilities to security and safety critical missions.

About the CASSINI Hackathons & Mentoring

6 hackathon events

10 hackathon locations per edition   **60 local organisers**

Hybrid   **Local**   **European**   **3 winning teams per edition**

6 months mentoring for all winners

▶ **Why** does it matter?

Solving important problems for society & industry with a purpose

Fostering the next generation of space entrepreneurs

Connecting participants, experts, businesses and other organisations

Giving people hands-on experience with EU space data and signals

Global themes with a purpose

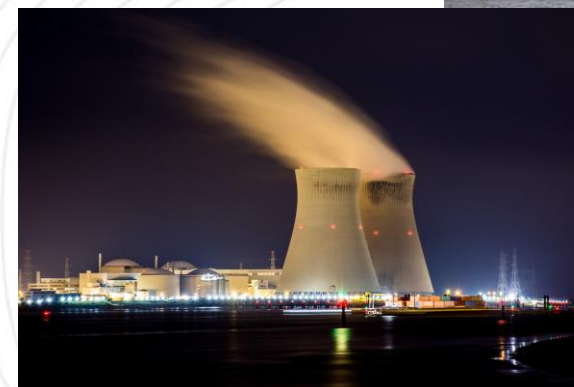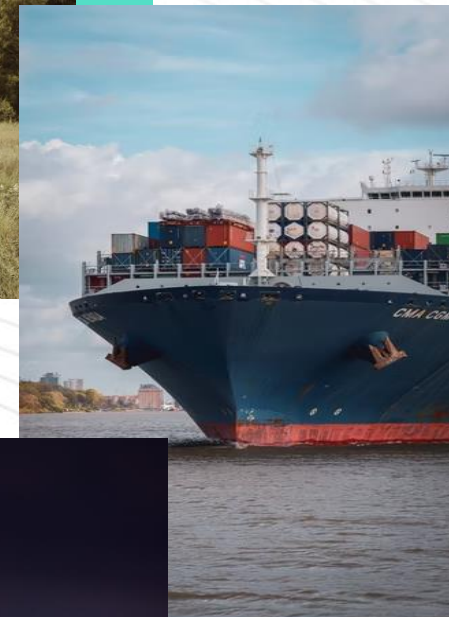Connecting with issues that are **important for our future**

What **resonates with the next generation** of hackers?

▶ **Space for defence & security**

In the 5th CASSINI Hackathon, participants are challenged to strengthen Europe's defence and security capabilities with the help of European space technologies.

The global security environment is becoming more contested, complex and interconnected. As armed conflicts and civil wars re-emerge on the EU's neighbourhood, new and unconventional security threats have emerged or grown stronger. In an increasingly interconnected world, Europe's security starts abroad. European citizens expect and deserve to live in a safe and stable environment. In the face of increased global instability, the EU needs to take more responsibility for its own security and increase its capacity to act autonomously.

Space data and services can enable novel and unique solutions for cross-terrain mobility and logistics, maritime threat intelligence and infrastructure network resiliency. We challenge participants to innovate with **earth observation data** from Copernicus and **satellite positioning and navigation services** from Galileo & EGNOS. Participants can also use other **public data** (reference maps, economic data, legal records, social media, marketplaces, computer networks, blockchains, etc.). In addition, participants should develop solutions **with cybersecurity in mind** from the start.

Space for Defence & Security

#1

Enabling cross-terrain mobility

#2

Making the seas more secure

#3

Protecting our critical infrastructure

Challenge #1: Enabling cross-terrain mobility

Movement of troops and assets is more important than ever to guarantee the security of European citizens. **Effective and efficient logistics allow to better prevent crises and deploy missions quicker.** Operations often take place in remote areas or in locations where road infrastructure is only partially adapted to the transport of heavy equipment, where it is sparse, or where it has been destroyed. Similar capabilities are needed for search and rescue operations, emergency response in case of disasters, and humanitarian aid missions. A good knowledge of the terrain and its accessibility is necessary to enable cross-terrain mobility. Factors like the elevation profile, water bodies, vegetation, soil trafficability, and weather conditions should be considered when moving large ground convoys.

This challenge tasks participants to **develop innovative concepts or design new products or services** with European space data and services from Copernicus and Galileo & EGNOS to **enable cross-terrain mobility of defence forces, emergency response teams, and humanitarian aid forces** through different types of terrain and in a variety of climate and weather conditions. We encourage participants to dive into the areas of:

* Up-to-date terrain and environmental intelligence
* Determining the best suitable routes from point A to point B across terrain
* Mission planning for defence, security, and emergency response operations
* Operational logistics for defence, security, and emergency response operations
* Support for search and rescue operations

Challenge #2: Making the seas more secure

As the second largest exporter and the third largest importer in the world, the European Union relies heavily on maritime transport. Unfettered and secure **access to the high seas and the primary maritime routes is important for trade and economic development, but has come under pressure** due to geo-strategic rivalries, piracy, and armed robbery. Maritime security is further compromised by other organised criminal activities, such as trafficking in weapons, drugs, and people. On top of that illegal fishing, dumping, and dredging, are destroying invaluable maritime ecosystems. The first step towards responding to the growing number of security challenges in the EU's vicinity and beyond, is building up maritime surveillance and reconnaissance capabilities. Satellite data is exceptionally fit for that purpose because of the vast scale of the oceans. Aside from law enforcement agencies, also the maritime sector itself could benefit from threat alerts and similar solutions.

This challenge tasks participants to develop innovative concepts or design new products or services with European space data and services from Galileo & EGNOS and Copernicus **to enable maritime intelligence on direct security threats, organised crime and environmental crime.** We encourage participants to dive into the areas of:

- Detection, identification and tracking of ships and other vessels
- Monitoring and mapping of security threats at sea
- Monitoring and mapping of illegal maritime activity
- Safe shipment route planning

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Challenge #3: Protecting our critical infrastructure

Disruptions of critical infrastructure such as power stations, water treatment facilities, bridges, harbours, airports, datacentres, internet exchange points, etc. has a major impact on daily life and public services, as well as global supply chains. Armed conflict, civil unrest or other security threats, such as cyberattacks, social engineering and sabotage, could disrupt these networks and shut down parts of the economy and society, leaving people without access to hospitals, schools, media, or other public services, and severely impair the delivery of goods, services, and information. Also, climate related disasters like floods, draughts, storms, and wildfires, can expose our infrastructure systems to new uncertainties, which can influence its current and future operating conditions and capabilities. Space data can provide intelligence in critical situations when our infrastructure has been or is about to be disrupted.

This challenge tasks participants to **develop innovative concepts or design new products or services** with European space data and services from Copernicus and Galileo & EGNOS to **assess the risk of disruption of critical infrastructure and plan for mitigation and recovery scenarios**. We encourage participants to dive into the areas of:

- Monitoring potential threats to critical infrastructure
- Assessing and forecasting security and environmental risks
- Identification of weak points in infrastructure networks
- Mitigation and recovery planning for governments and businesses

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Open for everyone with a passion for defence & security

▶ All European students, entrepreneurs, engineers, designers, researchers, policy makers, tourism professionals, and others are welcome to participate

On-site at one of the hackathon locations or remotely

No previous space experience is required!

▶ Online resources

▶ Relevant datasets

▶ Access to experts

▶ Hybrid experience

▶ Interesting speakers

▶ Cool prizes