

# → THE ESA EARTH OBSERVATION $\Phi$ -WEEK

## EO Open Science and FutureEO

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### Towards the Internet of Flying Objects

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**Foundend in 2009** – Includes enterprises in the aerospace field, universities, public and private research centres of Apulia

## Institutions



Consiglio Nazionale  
delle Ricerche



## Industries



## The Space Development Plan

### Capacity Building

- To develop local industry

### Develop Demand Side

- To federate regional Demand of service

### Interregional Cooperation

- To better interact with other Space Clusters in Italy

### International Cooperation

- To participate to European Space Programs

### Human Capital

- To provide education and training in space

### Technology Transfer

- To facilitate the spillover to other industries

## R&D

- 22 Industrial research projects
- 550 Researchers involved
- 38 SMEs and Large enterprises involved

## Training

- 15 Post graduate masters
- 143 Beneficiaries (graduates and holders of a diploma)
- 28.000 Granted lifelong Training hours
- 658 Employees /lifelong Training
- 264 Training projects to hire young diploma holders and young graduates
- 4 PhD
- 205 Schools involved in the orientation initiatives
- 19.600 Pupils who have taken part in the orientation initiatives

DTA and Aeroporti di Puglia began the development of the **Grottaglie test bed** to support:

- research & industrial innovation initiatives
- product development
- test & certification
- aviation experimentations & regulation development

*The GOAL was to launch RPAS into the non segregate air space to start the exploitation of their capabilities.*

In 2014 Grottaglie Airport has been qualified by National Civil Aviation Authority – ENAC - as an integrated logistics platform for research, development and testing for aeronautics related products.

# Grottaglie Airport and Air Space



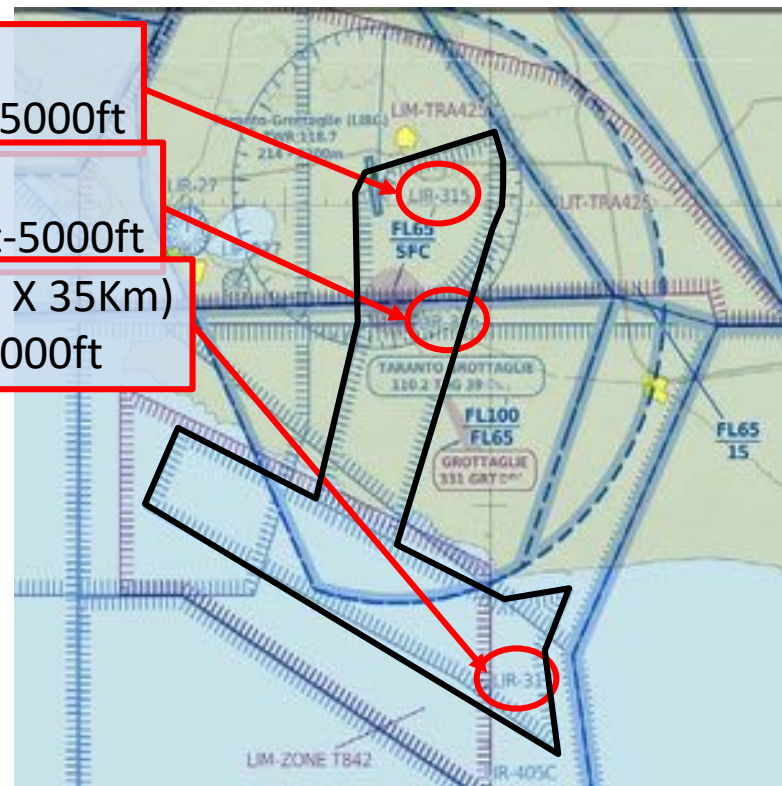
70sKm  
Altitude: SFC-5000ft

100sKm  
Altitude: 2000ft-5000ft

200sKm (~6Km X 35Km)  
Altitude: SFC-5000ft

## Runway:

- Length 3200m
- Width 45m
- Hangars, offices and meeting rooms available
- Industrial settlement



## Fully connected to the RECAS supercomputer center

- 8.000 cores, 3.500 TB, 800 clustered GPUs (NVIDIA K40 and K80)

## Civil and Military Airport

- Very Low commercial traffic
- Close to military bases
- Close to a big Harbour like Taranto

## Declared adequate for a Spaceport deployment

## Perfect Weather conditions to fly all the year



# «Apulian» Virgin Spaceport



## Space Tourism

- Apulia is many times better than Mexico Desert for tourists
- Three hours to connect Italy to California

## Sub-orbital flights

- Microgravity experiments
- Very High Speed Connections

## Access to Space

- Satellite launcher
- First agreement between SITAEL and Virgin already signed

# High Altitude Pseudo Satellites (HAPS)



# DTA most important projects



Project	Activity	Status	Budget
SHIRA	Thermal Satellite Study	Completed	16 M€
APULIA SPACE	SPACE Key Enabling Technologies	Completed	6 M€
RPASinAir	RPAS innovation	On Going	8 M€
FLET 4.0	Fleet Health Management	On Going	8 M€
CRUISE	Cyber Security 4 RPAS	Just Started	2 M€
CLOSE	All Electric Satellite	To be Started	9 M€
TEBAKA	EO for Agriculture	To be Started	6 M€



## Partners



ESA/ESEC - European space  
Security and Education  
Centre



## Consortium

- DTA
- Planetek Italia (Coordinator)
- Leonardo
- ENAV
- Telespazio
- Aeroporti di Puglia

## Users & stakeholders

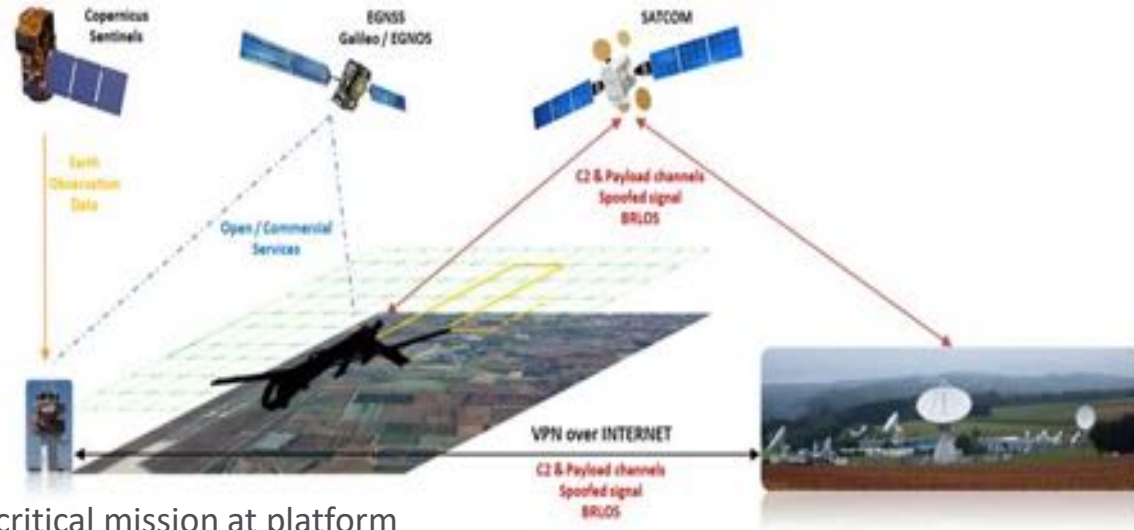
- Apulia Region (Dept. research, innovation and institutional capacity),
- Italian Civil Protection (VVFF);
- UMS Skeldar and Northrop Grumman;
- NATO COE;
- ASSORPAS,
- DRONE Valley

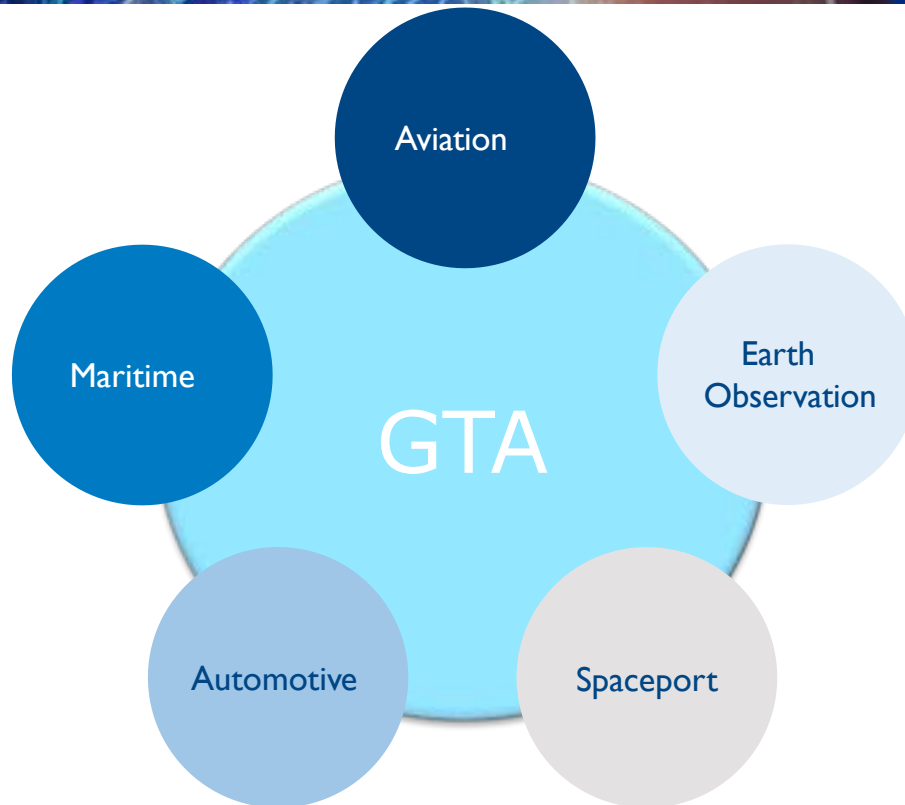
# Cyber Security: CRUISE

The CRUISE project will set-up a Cyber-Security Test Range for UAVs assessment.

Service portfolio of Cyber-security test, in the three Visual/Radio/Beyond Radio Line of Sight (VLOS/RLOS/BRLOS) mission operation conditions, will be:

1. End2End Vulnerability assessment
2. Cyber-attack scenarios definition for UAV critical mission at platform and payload level
3. Scenarios execution in simulated and real environment:
  - Without attack;
  - With attacks but without countermeasures;
  - With attacks and countermeasures.





Thanks to the past, current and future projects the GTA can provide services to simplify the different phases of testing of different platforms. Among them, the GTA aims to provide services for:

- Mission Planning;
- Mission Control System;
- Mission Simulation Platform;
- Communication Channels Emulation Platform;
- Cyber Security assessment
- Mission payload data processing & post-processing





Space architectures will be **less and less** based on

- One or even a few homogeneous orbiting satellites
- One or more dedicated Ground Segments

Space architectures will be **more and more** composed by swarms of ***“cooperative and competitive Space Agents”*** like

- Constellation of heterogeneous flying platforms
- Networks of other sensing and computational nodes
- Networks of heterogeneous, distributed Ground Segments



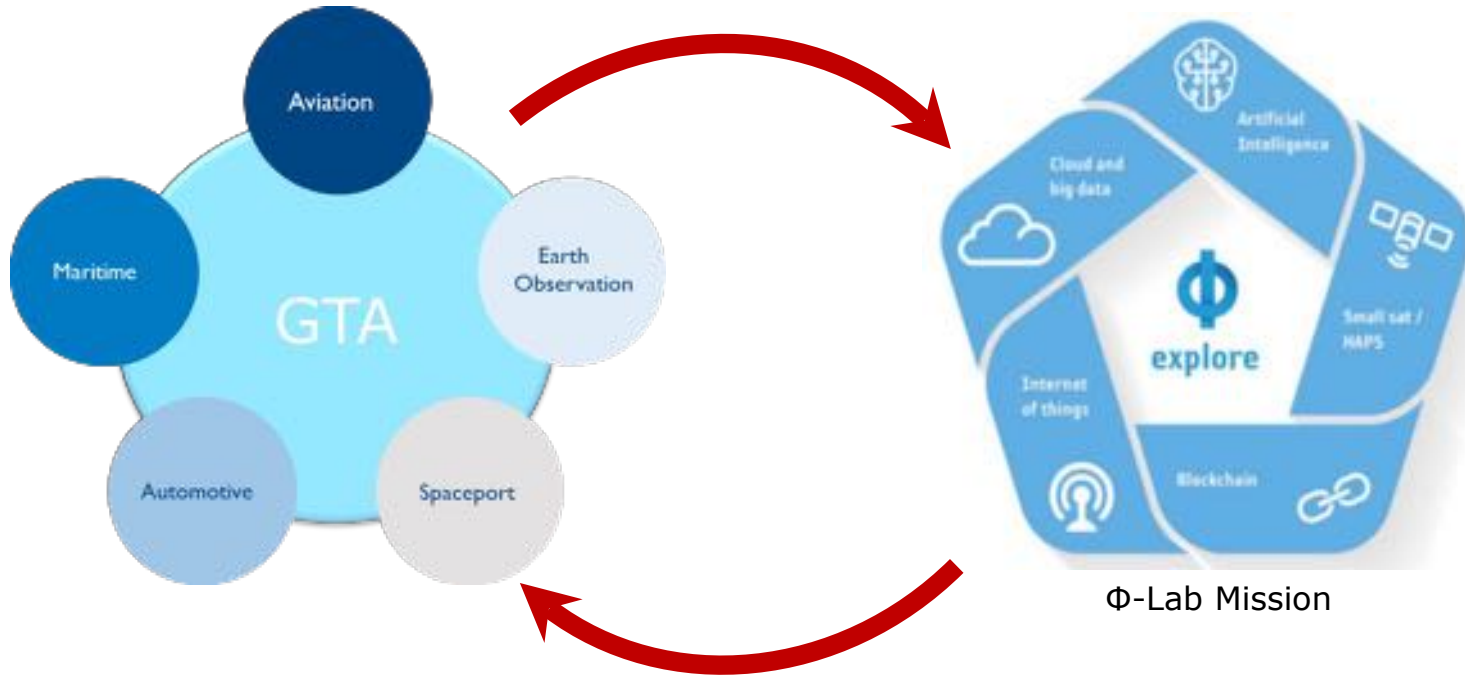
Innovative **Concepts of Operations** and **Technologies** need to be investigated

- IoT integration
- Artificial Intelligence
- Blockchain
- Cybersecurity



# GTA and $\Phi$ -Lab co-creation

GTA for complementing and implementing a distributed phi-lab vision.



# Thank you for your attention

For further information

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