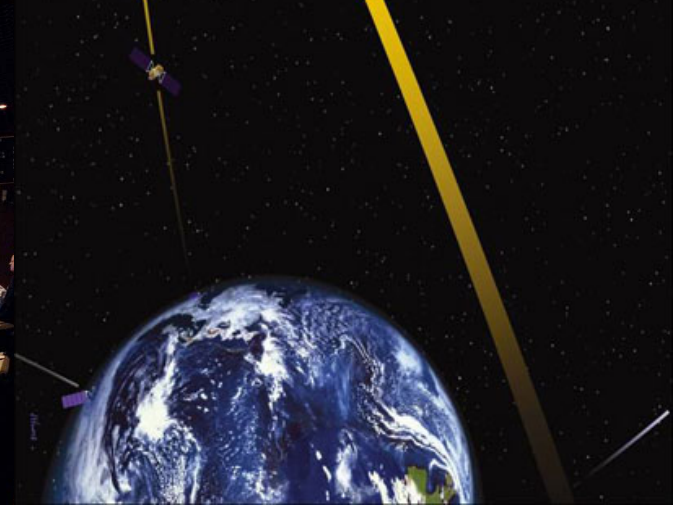
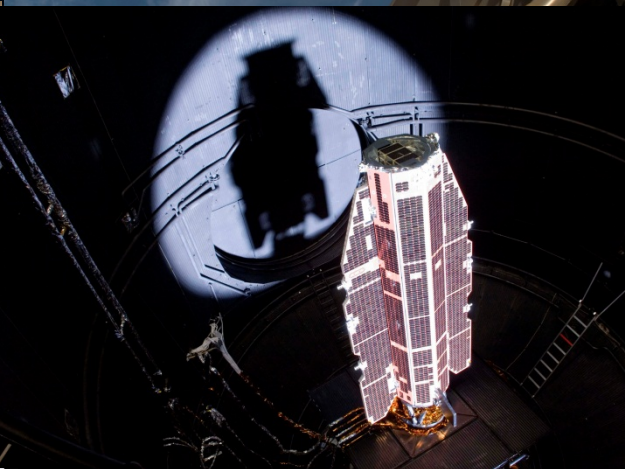
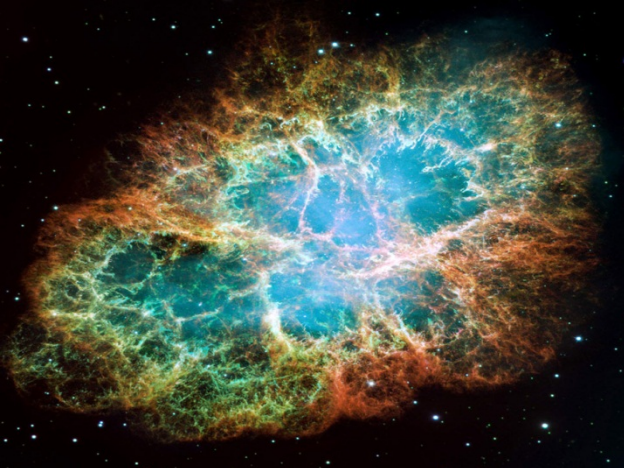


# *FlySafe- ESA Integrated Applications Promotion (IAP) programme opportunities*

*Integrated and Telecommunications-related Applications Department  
European Space Agency*

NEREUS Workshop - 10<sup>th</sup> May 2017 Rzeszow/Poland







# Purpose of the European Space Agency

“To provide and promote, for exclusively peaceful purposes, cooperation among European states in **space research** and **technology** and their **space applications**.”



- Article 2 of  
ESA Convention

# *ESA Telecommunications programme: ARTES*

**ESA implements a comprehensive satellite telecommunications and applications programme which addresses all aspects of the sector under a flexible programmatic framework known as:**

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## **ARTES - Advanced Research in Telecommunication Systems**

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**ARTES is run by the Directorate of Telecommunications and Integrated Applications. The objectives of the ARTES program are to:**

- maintain and improve the capability and competitiveness of industry of participating countries in the world satcom market**
- contribute to the resolution of problems that affect the European Institutions and the European society at large**

# ESA in Space Applications. What's for?

ARTES Applications is a subset of the ARTES programme elements dedicated to funding and promoting the development of space-based downstream applications, services and solutions for the needs of European citizens and society at large.

service providers,  
industry



institutions, users,  
potential customers

Strong presence of  
SMEs prime (68%) and  
ESA newcomers (50%)

# IAP Mission: "Space for Daily Life"



In close partnership with  
**end users** ...

**market pull**

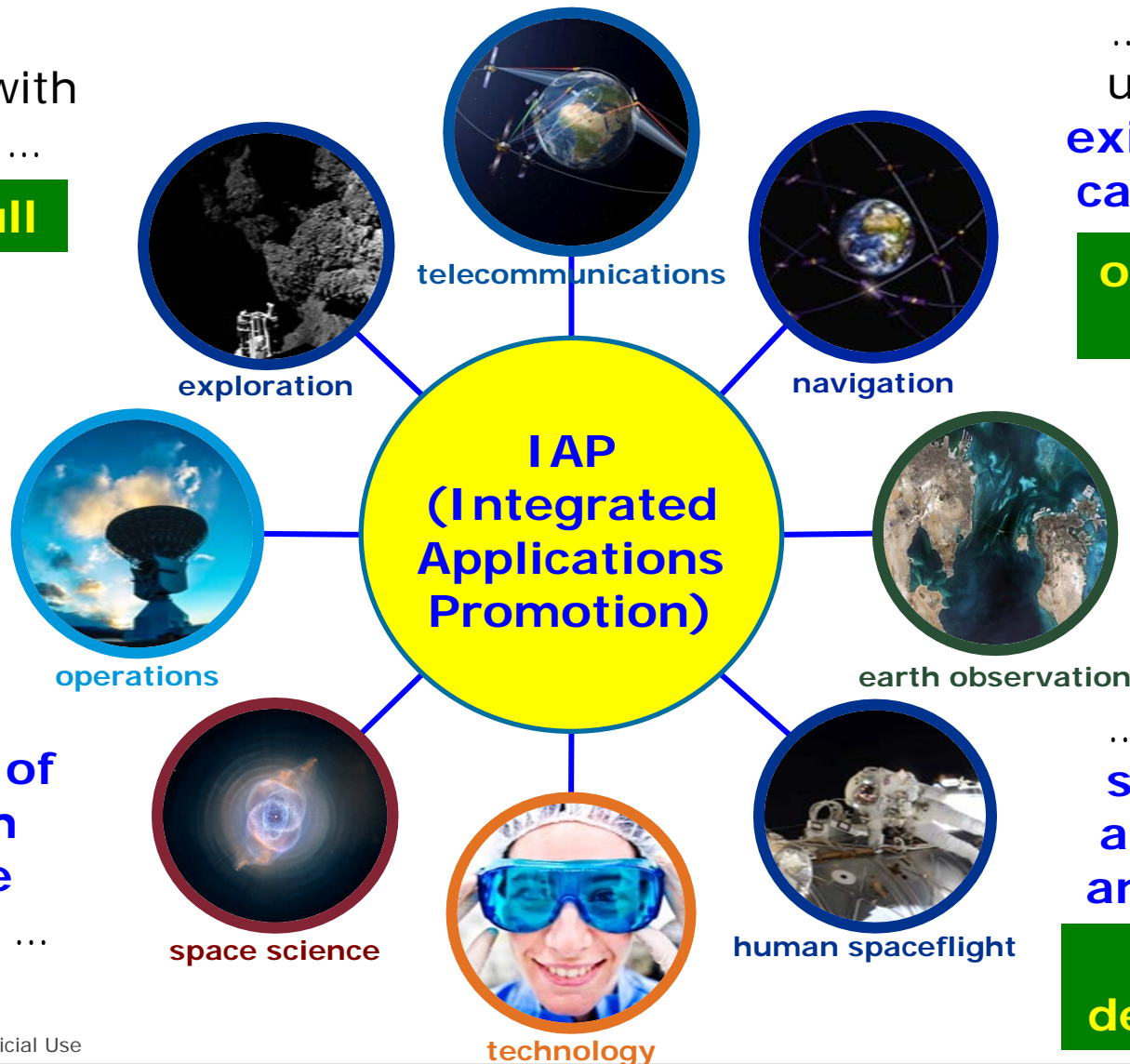
... foster the  
utilisation of  
**existing space capabilities** ...

**operational,  
reliable**

... through  
**integration of space with non-space technologies** ...

... to develop  
**sustainable applications and services.**

**business development**



## Thematic Areas



## INCUBATOR of Service



# ARTES Applications Institutional Cooperation Strategic Partnerships



Maritime  
Activities



RPAS  
Activities



eHealth for Sub-  
Saharan Africa



Space for Rail



"SMAP Fund"

Space for Mediterranean  
Acceleration Programme





# Multiple ARTES activities in the Aviation domain

## Feasibility

## Demonstration

## Operational

Unmanned Postal Delivery

SharperS at integrated solution for TSOs and DSOs

DEADALUS  
Enhanced weather threat awareness for aviation

B-LiFE  
biological crisis field laboratory

KORE  
crop precision farming

RAPSODY  
UAV based S&R (1) and Pollution Monitoring

SURMON (UASatcom)  
exploration & pipeline monitoring

DART  
Airtaxi support services

SAFEDEM  
enhanced and safe demining

STEAM  
ship emission aerial measurements

AMMO  
Aerodrome monitoring

DESIRE 2  
Integrating RPAs into non-segregated airspace

Planet-2  
Weather information services

HARP  
Space weather impact on comms

Daedalus  
Weather hazard information

Bird Strike Risk Reduction for Civil Aviation

Sky Liberty  
Aviation Navigation Support

S2BAS  
remotely operated airports

ViaDrone  
PoC for Operation Management System+Air Traffic Insertion

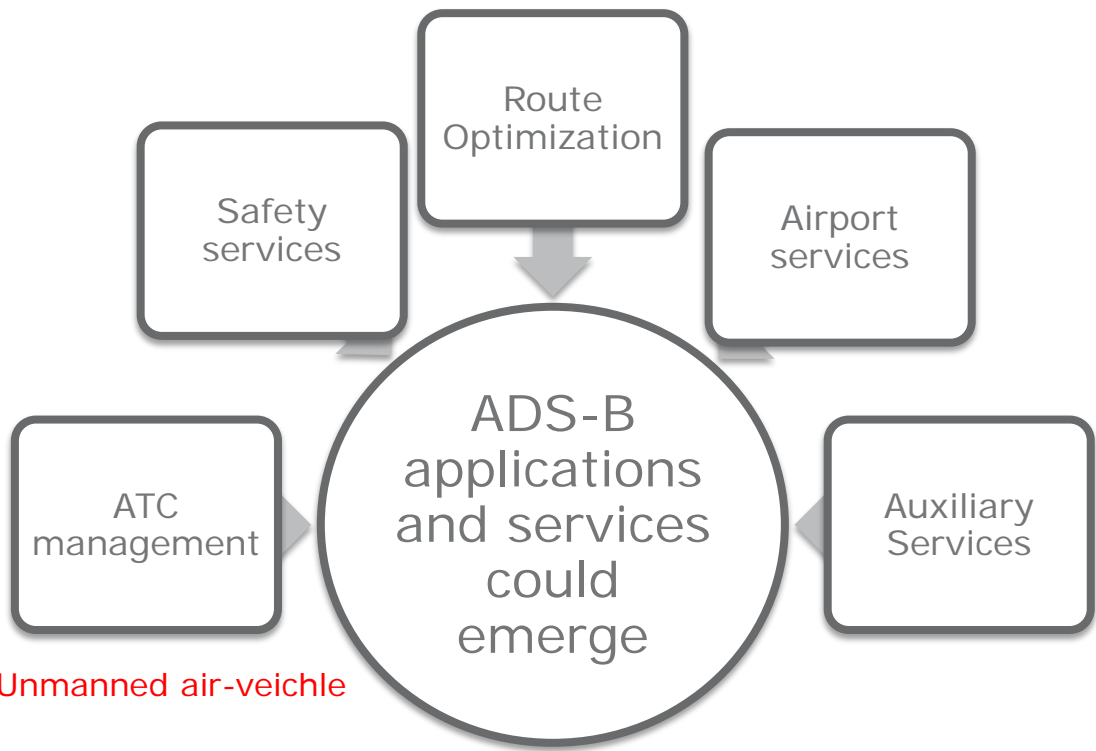
FlySafe  
Bird strike risk maps for airforce

## User / Customer Engagement

**On the 27<sup>th</sup> September the ESA ARTES IAP Tender on ADS-B has been issued. The tender is now closed, the negotiation phase is on-going.**



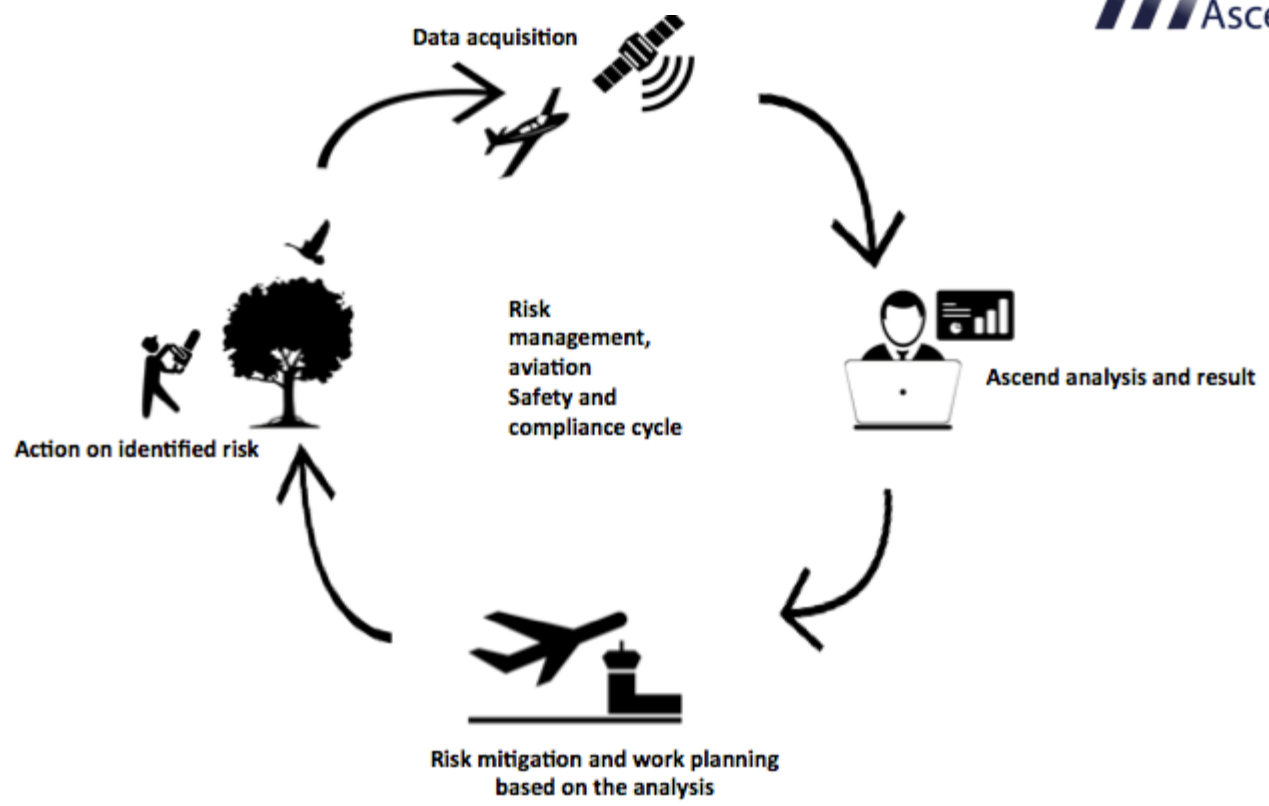
**Feasibility Study Objectives:** to identify and characterize ADS-B based services addressing potentially interesting application domains, carry out the analysis of their technical feasibility and commercial viability, select the most promising ones for further development and exploitation, and propose a roadmap for the implementation and demonstration of the proposed services.



Partnership established with:



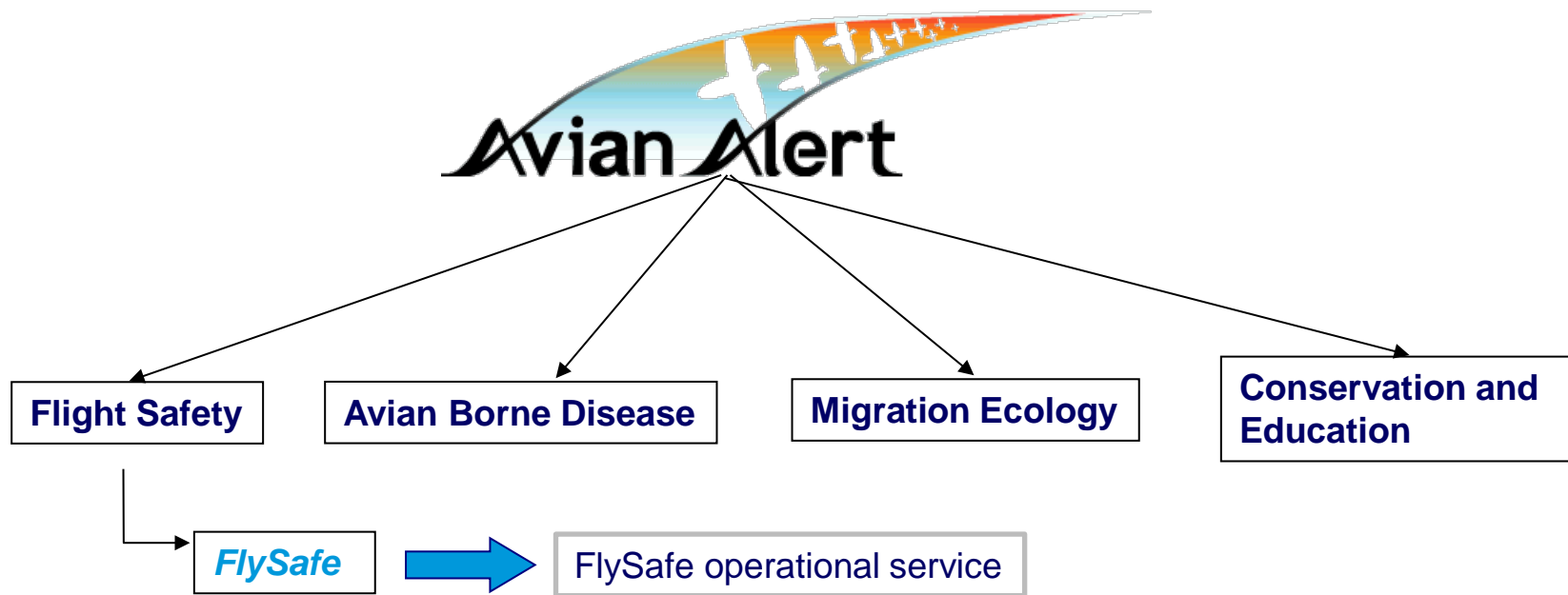




<http://www.esa.int/spaceinvideos/Videos/2016/08/Ascend - the wildlife management solution for airports>

# FlySafe Demo Project: Background

- In 2006, the European Space Agency carried out the Avian Alert study to define sustainable services for various stakeholders that need information on bird migration and bird mobility.
- The following market segments were addressed:



- The bird strike issue was tackled first because of its fast-track potential and users' commitment to support the project.
- Opportunities for other domains are under investigation.

# FlySafe Demo Project: objectives, activities and team

**FlySafe objectives:** To develop a bird warning service to reduce the risk of bird strikes for Air Forces by:

- Improving existing en route bird detection systems
- Developing bird migration forecast models
- Developing tools for bird flight activity detection at and near airports

## FlySafe activities:

- Started in June 2007 in partnership with: Dutch, Belgian, German and French Air Forces



## FlySafe project team:





# FlySafe Demo Project: outcome (1)



FlySafe service platform operated by KNMI (NL): <http://www.flysafe-birdtam.eu/public/>

[Home](#) [Migration](#) [More information](#) [About us](#) [Legal Disclaimer](#)

### The FlySafe Bird Avoidance Model (FlySafe-BAM)

The FlySafe Bird Avoidance Model, Operational Service Centre provides near real-time information and forecast on large scale bird mobility in the air space of The Netherlands and Belgium. The information includes bird density measurements and predictions and altitude profiles over The Netherlands and Belgium. This information is used by the Belgian Air Force (BAF) and the Royal Netherlands Air Force (RNLAf) to create and disseminate BIRDAM's (bird notice to airmen) to their pilots, enabling them to adjust their operations and avoid collisions between aircraft and birds.

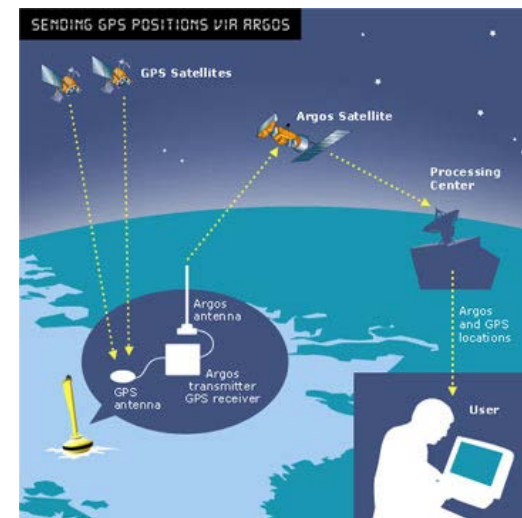
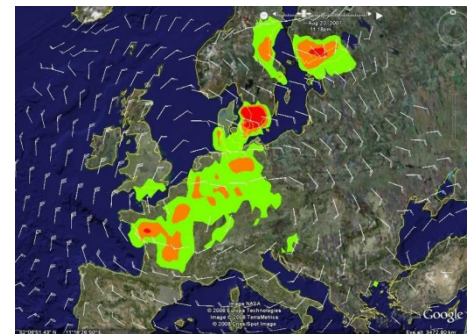
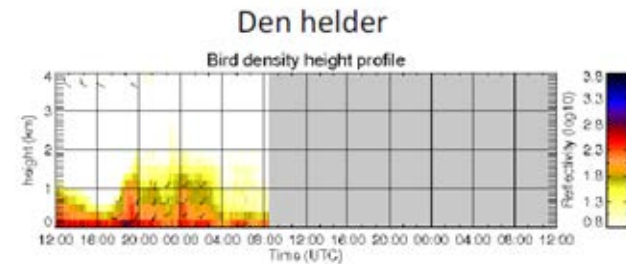
The FlySafe Bird Avoidance Model, Operational Service Centre is the result of the FlySafe project initiated by the European Space Agency's (ESA) Applications Promotion (IAP) programme in partnership with the BAF and the RNLAf to develop a bird warning system to reduce bird strike risk of collision and improve flight safety in northwest Europe.

This website presents:

- Near real-time measurements of local bird movements and bird density altitude profiles;
- Forecast of bird migration intensity over The Netherlands and Belgium;

# FlySafe Demo Project: outcome (2)

- Models providing aggregated bird density height profiles based on weather radars (status: operationally used, further being developed).
- ***Spatial Explicit migration models (SEMM)*** providing bird behaviors *per specie* taking into account landscape, land use and weather conditions (status: developed and tested for a limited number of bird species: e.g.: passerines)
- Studying birds' specie behavior (including Lesser Black-backed Gulls, Herring Gulls and Barnacle Goose ) using tracking data:
  - Core areas and habitat preference
  - Migratory patterns
  - Identify rules of thumb that influence movement
  - Habitat dynamics using remote sensing data

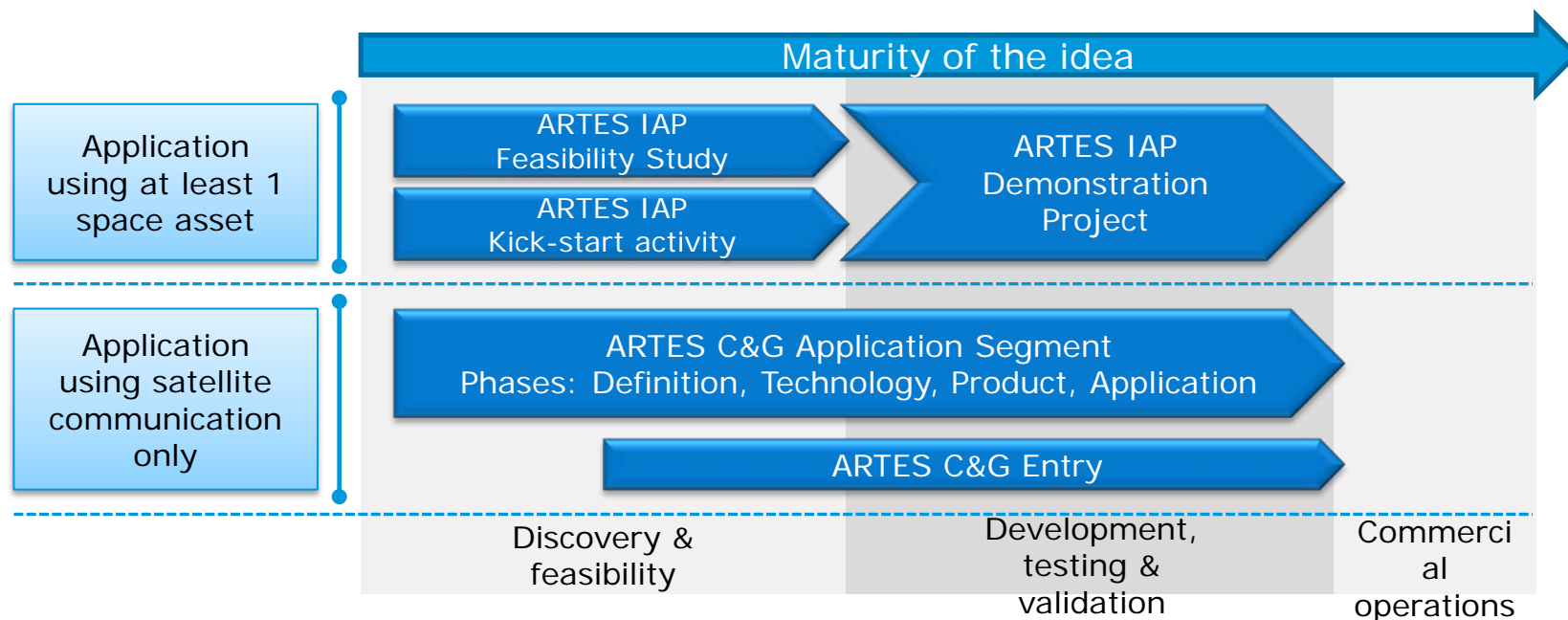


- IAP acts as service incubator for developing and demonstrating new solutions, providing funding to Industry of ESA Member States addressing specific user needs
- Space can play a major role in providing weather monitoring information, safe command and control and data relay links to manned and unmanned vehicles (aircrafts, maritime, cars)
- IAP encourages industries interested in the development of commercial applications that involve the utilization of space



- IAP has extensive expertise as service incubator and in projects including integration of space assets in the aviation area. Partnerships with regulators have been established to support the consolidation of the regulatory landscape.
- IAP is therefore ready to further contribute to the development of future space based applications and services for a wide range of sectors and particularly aviation.

# The ARTES Applications Opportunities



Please visit: <http://artes-apps.esa.int>

Contact: [iap@esa.int](mailto:iap@esa.int)

*Piera.Di.Vito@esa.int*



*"Space is the Limit"*

*Thank You!*