

# Introduction to the European Space Agency

David Lumb – Astrophysics Missions, Science Support Office  
May 2014

- **Over 40 years of experience**
- **19 Member States**
- **Five establishments in Europe, about 2200 staff**
- **4 billion Euro budget (2011)**
- **Over 70 satellites designed, tested and operated in flight**
- **17 scientific satellites in operation**
- **Six types of launcher developed**
- **Celebrated the 200th launch of Ariane in February 2011**



All Member States participate (on a GNP basis) in activities related to space science and a common set of programmes (**Mandatory** programmes).

## **Mandatory**

- General Budget: Future studies, technological research, education, common investments (facilities, laboratories, basic infrastructure)
- Science: Solar System science, astronomy and fundamental physics

In addition, Member States choose their level of participation in **Optional** programmes.

## **Optional**

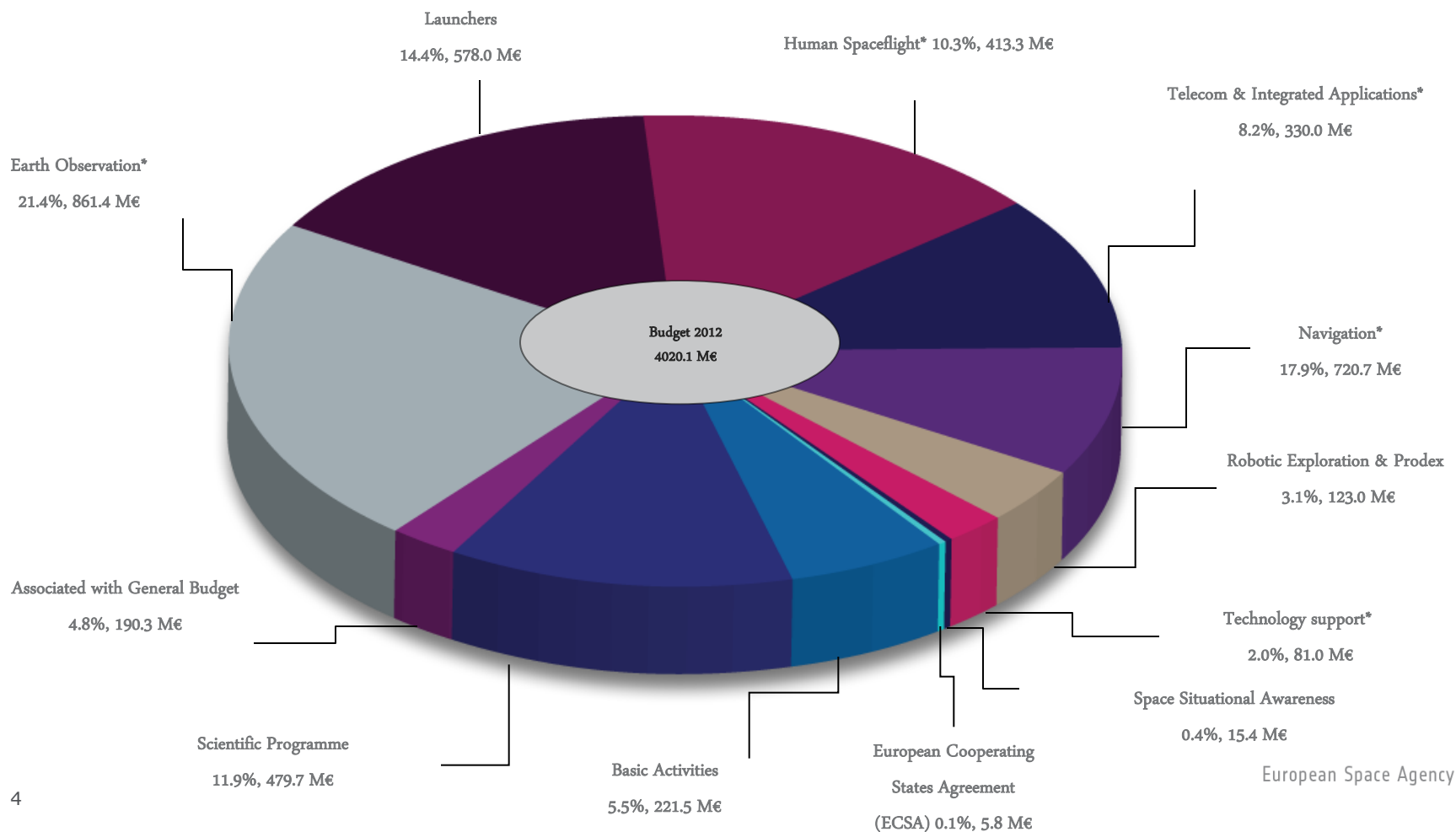
- Human Spaceflight
- Telecommunications & Integrated Applications
- Earth Observation
- Launchers
- Navigation
- Robotic Exploration
- Space Situational Awareness

# ESA 2012 Budget

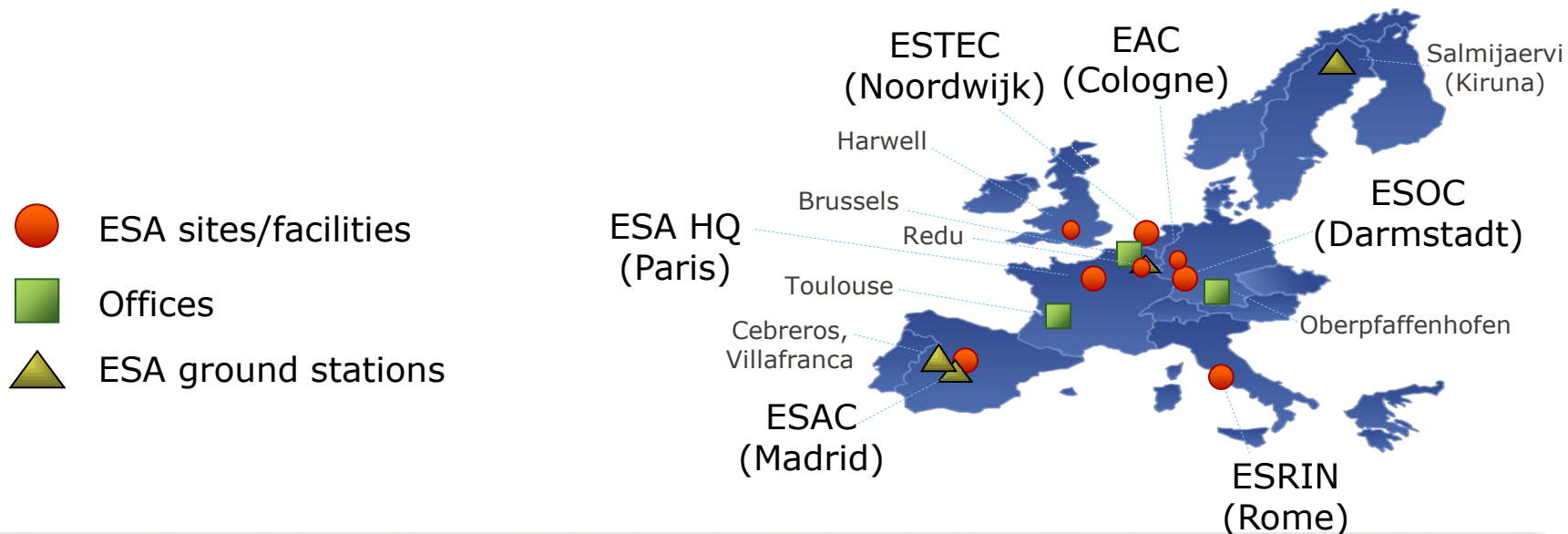


**M€: Million Euro**

**\*includes Third Party Activities**



# ESA'S LOCATIONS





# ESTEC, Noordwijk, The Netherlands





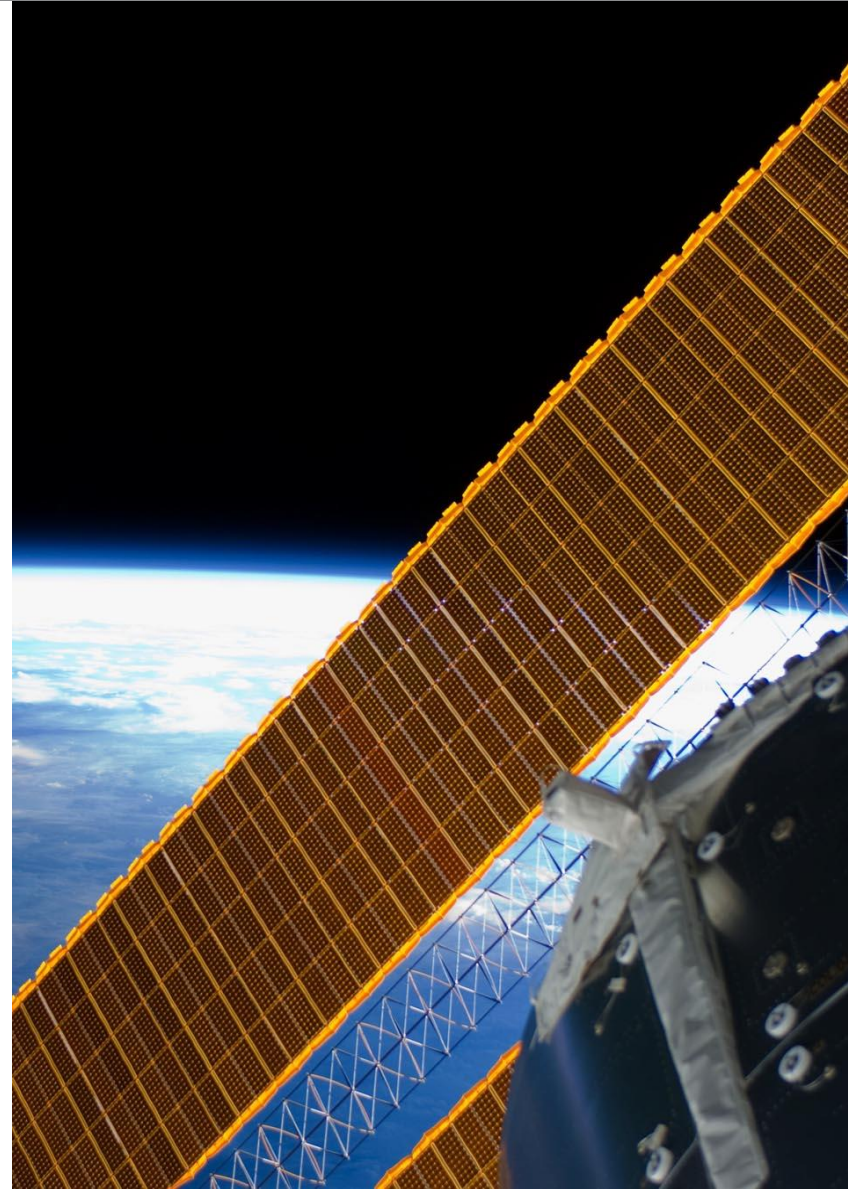
# ESA TECHNOLOGY PROGRAMMES



# TECHNOLOGY PROGRAMMES: OBJECTIVES



- **Enabling** missions of ESA and national programmes by developing technology
- Fostering **innovation** by creating new products
- Supporting the **competitiveness** of European industry
- Improve European **technological non-dependence** and the availability of European sources for **critical technologies**.
- Facilitate **spin-in** from outside the space sector





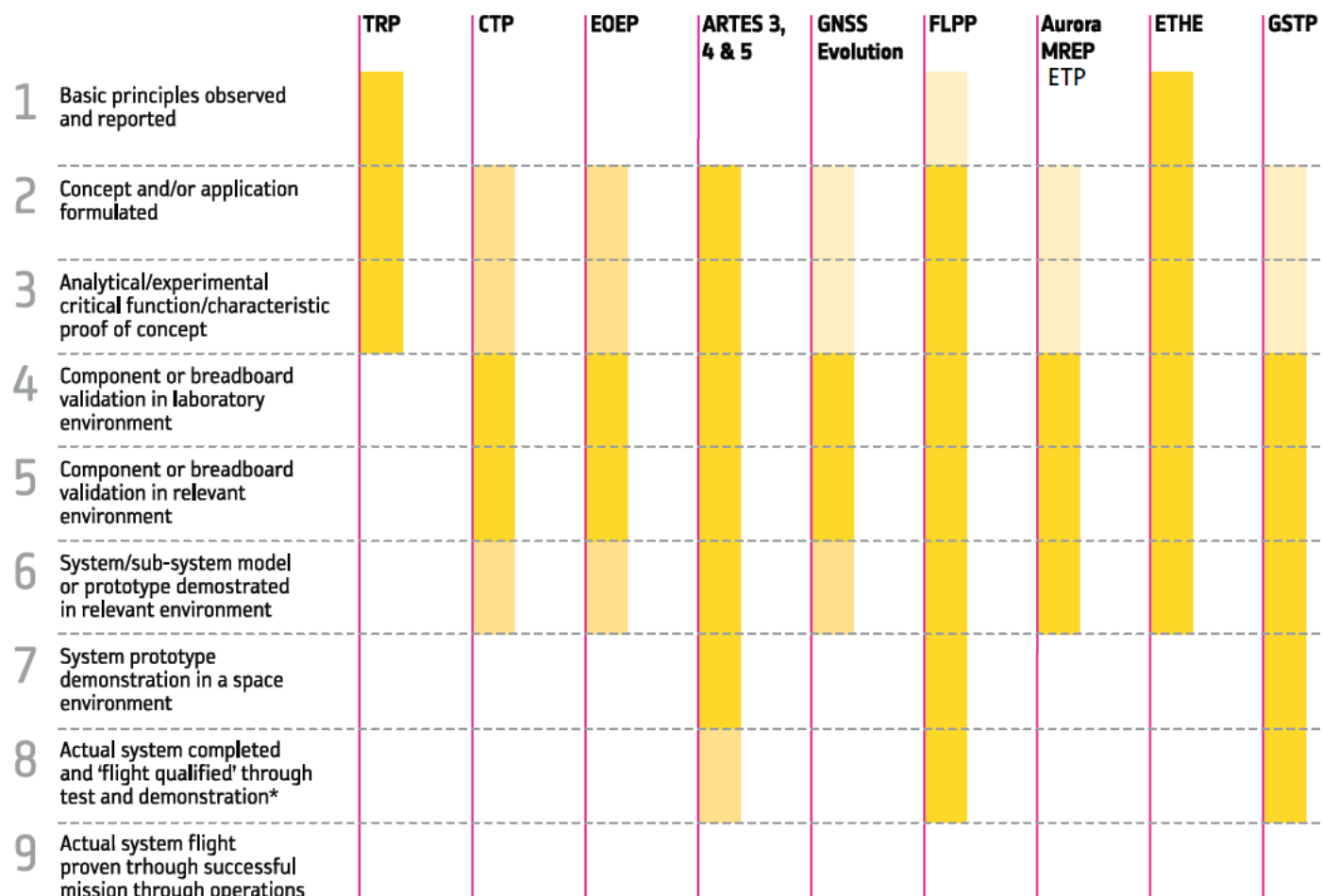
## Mandatory Programmes

- Science Core Technology Programme (CTP),
- **Basic Technology Research Programme (TRP)**
- **European Components Initiative (ECI)**

## Optional Programmes

- **General Support Technology Programme (GSTP)**
- Earth Observation Envelope Programme (EOEP)
- Advanced Research in Telecommunication Systems (ARTES 3-4, 5)
- European GNSS Evolution Programme (EGEP)
- Future Launchers Preparatory Programme (FLPP)
- Mars Robotic Exploration (MREP)

## Technology Readiness Levels



\* Ground or space

# END-TO-END ESA TECHNOLOGY MANAGEMENT PROCESS



## ESA Technology End-to-End management

