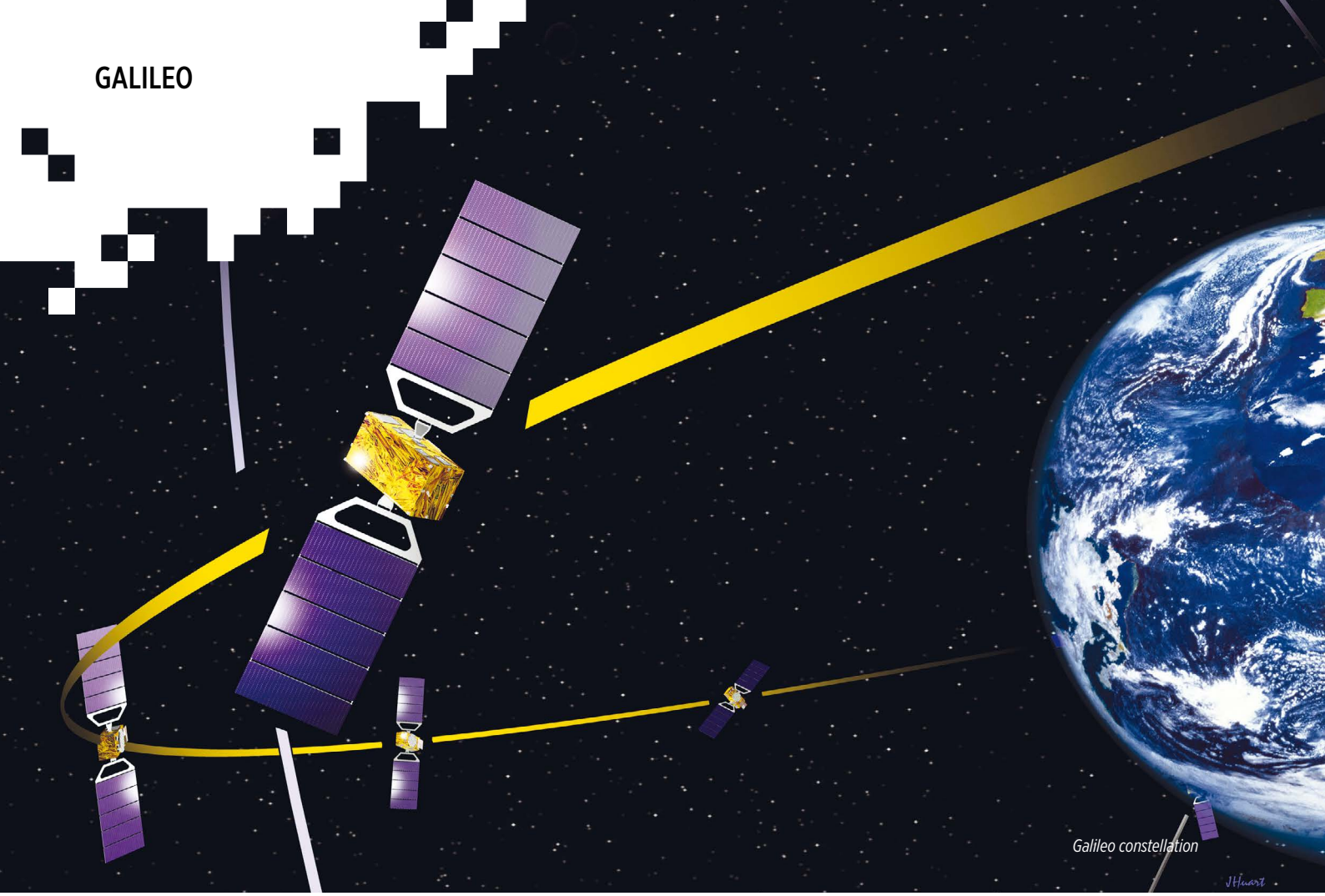


# THE GALILEO PROGRAMME

Galileo is Europe's programme for a global navigation satellite system, providing a highly accurate, guaranteed global positioning service, interoperable with the US GPS and Russian Glonass systems.
It consists of 30 satellites and ground infrastructure.

## TELESPAZIO'S ROLE

Telespazio (a Leonardo-Finmeccanica/Thales company) plays a leading role in the development of the Galileo programme, having built, at the Fucino Space Centre, one of the Galileo Control Centre (GCC), which will manage the programme's constellation and mission. A second GCC was built by DLR GfR, a company of the German Space Agency (DLR), in Oberpfaffenhofen (Munich).
Telespazio is heavily involved in all the phases of the system's operational life span of Galileo through Spaceopal, its joint venture with DLR GfR, who manages and coordinates the services using the "LEOP Operations Control Centres" in Toulouse (France) and Darmstadt (Germany), operated by CNES and ESOC respectively, which provide constellation launch and early orbit phase services. Spaceopal uses the GCC at Fucino and Oberpfaffenhofen for the provision of the navigation signals and the in-orbit control of the satellites. It also manages the IOT system at Redu (Belgium) for the In Orbit Test phase for the launched satellites.
**Telespazio France** also plays an important role through its teams in Toulouse and Kourou: the company supports CNES and Arianespace respectively in the management of the Launch Centre in Guiana and in the operations of launch and early orbit the Galileo satellites.
**Telespazio VEGA Deutschland** has developed since 1999, for the European Space Agency, the Galileo System Simulation Facility (GSSF). Currently, the company is prime contractor for both the Constellation Simulator for the Ground Control Segment and the Assembly, Integration and Validation Platform for the Ground Mission Segment.

## THE GALILEO PROGRAMME

Galileo is developed in collaboration between the European Union and the European Space Agency (ESA). Galileo's modern and efficient design will increase Europe's technological independence, and help to set international standards for Global Navigation Satellite Systems (GNSS). Throughout 2014, Galileo began a validation campaign for the supply of the first types of service: a free Open service, a Commercial service, and a Public regulated service, with the addition of a Search and Rescue support service. These services, after the initial test phase, will be progressively offered as the constellation grows.

## GALILEO SERVICES

The services offered by the Galileo system differ depending on whether the signals are open or encrypted and can be used according to the needs of the end-user:
**Open Service (OS)** - This service is based on open signals for all citizens.
**Commercial Service (CS)** - This service is based on an encrypted signal, enabling the provision of dedicated, commercial services offering location and time information.
**Public Regulated Service (PRS)** - This restricted-access service provides information on location and time to specific users such as the security forces (police, military) that require high levels of signal reliability and continuity.
**Search and Rescue Support Service (SAR)** - This service is able to detect emergency signals, relaying them immediately to emergency service centres. It will be used to manage alerts and locate users who are at risk.

## SERVICES AND INNOVATIVE APPLICATIONS

Telespazio is developing a wide range of applications based on Galileo, for civilian use (Open Signal and Commercial Services), as well as government use (Public Regulated Services). Galileo and EGNOS (European Geostationary Navigation Overlay Service), infrastructure that guarantees satellite navigation enhancement in Europe, will foster the development

GCC, Fucino


Main Control Room GCC Fucino

of applications for land, air, rail and maritime transport, telecommunications, Earth mapping, oil exploration and mining. In **EGNOS** Telespazio provides system maintenance activities, telecommunications and logistics services. The company will also develop new services in various public and private sectors including highway, rail, and maritime.

For several years Telespazio has participated in projects in the navigation field. Among these, the SENECA programme, developed by the Italian Space Agency and ENAV to facilitate the dissemination of the EGNOS-based satellite navigation in the Italian air traffic sector, and the European programme MEDUSA, to initiate the adoption of such services in the countries of North Africa and the Middle East in the Mediterranean basin. Telespazio also developed solutions for the use of EGNOS services in ITS applications (Intelligent Transport Systems) for the transport of hazardous goods. These solutions are used for tracking and monitoring the road transport of hydrocarbons in the European programme SCUTUM and the containers used for gas transport on intermodal road-rail routes in the European programme CORE.

## THE GALILEO CONTROL CENTRE

The Galileo Control Centre (GCC) in Fucino, which was part financed by the Abruzzo region, covers around 5,000 square metres. The GCC handles the transmission of the navigation signal to the satellites, while also guaranteeing the quality of service provided to end users. From the main control room, it is possible to control the orbit of all the satellites in the constellation, managing a network of about 40 ground stations spread right around the globe. The Galileo Control Centre in Fucino houses the Precise Timing Facility (PTF), which contains the atomic clocks that generate the frequency references and the time signals essential for the workings of the entire Galileo constellation. The Precise Timing Facility uses ultra-accurate synchronisation techniques, which also ensure that the Galileo system and GPS are interoperable. Once fully operational, the GCC will monitor the orbit of the Galileo satellites via a main control room and a dozen integrated control rooms manned 24 hours a day by highly skilled personnel.


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