

# → ESA'S EYE ON EARTH

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**headquarters**

Seat of the ESA Council and Director General, and well as some Directors, plus offices of human resources, legal affairs, finance, budget, internal audit, international relations and communications.



**estec**

The European Space Research and Technology Centre in Noordwijk, The Netherlands, is ESA's largest site. This is where most ESA spacecraft projects are born and guided through their phases of development.



**esoc**

The European Space Operations Centre in Darmstadt, Germany, is where ESA's ground station systems are developed and the smooth working of spacecraft in orbit is ensured.

**esrin**

ESRIN in Frascati, near Rome, Italy, is ESA's centre for Earth observation, and develops information systems and hosts the Vega small-launcher project.



**esac**

The European Space Astronomy Centre, near Madrid, Spain, hosts the science operations centres and scientific archives for ESA's astronomy and Solar System missions.



**eac**

The European Astronaut Centre in Cologne, Germany, is home base for the European astronauts. It is a centre of excellence for astronaut training and medical support for ESA and partner agency astronauts.



**guiana space centre**

ESA's launchers lift off from Europe's Spaceport in Kourou, French Guiana. It is jointly operated by the French space agency (CNES) and Arianespace with the support of European industry.

**The European Space Agency (ESA) is Europe's gateway to space. We guide the development of Europe's space capability and carry out pioneering research in all areas of space activity.**

For over 40 years, ESA and its predecessors have been shaping and sharing space. We have been managing the research and development programmes needed to keep Europe at the forefront of space exploration and applications. We have been ensuring that investment in space delivers benefits to the citizens of Europe and the world: from jobs and economic growth, to public services, efficient communications and security.

ESA is a prime example of what can be achieved by working together – a model for multicultural and international cooperation. By pooling resources, we are able to develop fascinating projects that would not be possible for individual countries. The results of this cooperation are world-class industry, outstanding scientific discoveries and a stronger, richer European identity.

**esrin**

**→ ESA'S EYE ON EARTH**

**Dedicated to ESA's Earth-observing activities, ESRIN, in Frascati, Italy, is the European centre of excellence for exploitation of Earth observation missions.**

- ESRIN hosts the seat of ESA's Earth Observation Director.
- ESRIN is where the missions and payload operations of ESA's Earth observation satellites are managed, together with the acquisition, distribution and exploitation of data from these and other non-ESA satellites.
- ESRIN is where Earth Observation applications are developed and exploited.
- ESRIN is home to the Global Monitoring for Environment and Security (GMES) programme office.
- ESRIN plays a key role in Europe's efforts to ensure growing numbers of satellites are placed into orbit by developing a new small launcher, Vega.
- ESRIN designs and develops all ESA-wide software for corporate applications, and is also responsible for developing and implementing security measures for classified space programmes managed by ESA.
- ESRIN fosters European industry by supporting its companies and institutions in developing new space applications and helping start-up companies turn their ideas into businesses.
- Here also, ESA's archives preserve and safeguard the invaluable knowledge accumulated over the years for the benefit of future generations.

# → ESA'S CENTRE FOR EARTH OBSERVATION



Earth observation satellites are one of the most important assets brought to us by the space age.

“ Today, data about our planet are acquired continuously; giving us powerful tools for better understanding and improved management of Earth and its environment. ”

– Volker Liebig,  
Director of ESA Earth Observation Programmes

By helping us to understand our planet and secure our environment, Earth observation data benefit our daily lives in many ways.

Monitoring the growth of cities, mapping the habitats of endangered species, forest monitoring, tracking ground subsidence, assisting the management of scarce water resources, detecting oil slicks, guiding ships through ice and rough seas and helping aid workers are just some of the many ways these data are being used.

ESRIN manages the payload operations of ESA's Earth observation satellites and ensures their data are processed, archived and distributed to users. ESRIN works closely with space agencies and organisations worldwide, and also cooperates with many

small and medium-sized enterprises. ESRIN ensures that instrument performance and product quality are constantly checked and that new products are developed in response to evolving user demand.

The European Commission initiative, Global Monitoring for Environment and Security (GMES), has been set up to meet the growing need among European policy-makers and users for accurate and timely information, to better manage the environment, understand and mitigate the effects of climate change and ensure civil security. GMES relies largely on data from satellites observing Earth, so ESA is developing and managing the Space Component, which includes a series of five space missions called 'Sentinels'.

# → MANAGING EARTH OBSERVATION MISSIONS

“ We seek to maximise exploitation of these data by fostering the use of this valuable information by as many people as possible, in as many ways as possible. ”

– Henri Laur, Head of Earth Observation Missions Management Office

By mid 2012, eight ESA Earth observation satellites will be in orbit, and ESRIN is responsible for managing the scientific Earth Explorer missions and their payload operations. Each satellite has an assigned mission manager based here to ensure the objectives and user requirements of each mission are met. From 2013, ESRIN will also manage operations for the transition phase of the GMES Sentinel satellites. They work to resolve any satellite problems and to request changes needed to spacecraft, instruments or flight paths to meet requests for specific data.

These missions constantly transmit data back to Earth. ESRIN manages a complex and decentralised worldwide cooperative ground segment that ensures the data are acquired from receiving stations and processed at ground stations. ESA also uses its multi-mission ground systems to acquire, process and archive data from satellites of 30 partner agencies,

known as 'Third Party Missions'. Data from these missions are also managed from ESRIN.

Finally, ESRIN coordinates a decentralised archive for Earth observation data, including national facilities. The centre continuously adds to its distributed data archives – the largest collection of its kind in Europe – and makes it available to scientists free of charge. Emerging technologies, such as GRID, are being employed to meet user requirements and improve services.



# → USER SERVICES AND TRAINING



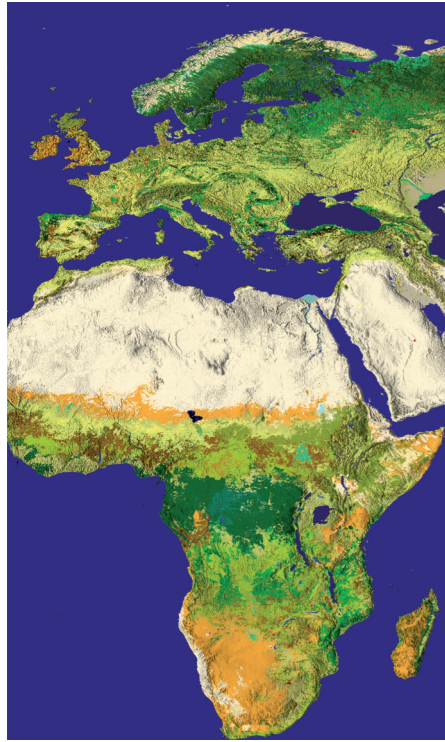
Several thousands of scientists and users, and organisations worldwide, look to ESRIN to supply the Earth observation data they need to carry out their work. ESRIN hosts User Services and a Help Desk to respond to these needs.

User Services translate user needs into system operating plans and product orders, deciding how best to task the satellites to provide the requested data. The Help Desk helps users to

understand the various data sets available, how to access them and use software tools to process them.

ESA educates and trains users in the uses of these data, how to implement applications and how to interpret satellite imagery. As the centre of these education efforts, ESRIN hosts workshops with scientists, regular training courses, summer schools and outreach events.

## → EXPLOITING THE DATA



ESRIN constantly strives to ensure the data supplied by ESA's Earth observation satellites respond to user requirements and to raise awareness about the potential use of these data to support European policies.

ESRIN also seeks to increase the use of satellite data through a series of programmes that foster partnerships between research institutions, service companies and user

organisations. ESRIN manages over 5000 scientific projects using remote sensing data and application projects with over 400 user organisations. These programmes support the development of innovative observation-derived information products and services, and test their potential to become sustainable businesses in the growing market for geo-spatial information. Programmes in the field of applications involve a wide number of users.

“Satellite data from ESA, including the future Sentinel missions whose data are expected to be open and freely accessible, will be crucial for ecosystem managers in Europe and worldwide.”

– Jacqueline McGlade, Executive Director, European Environment Agency

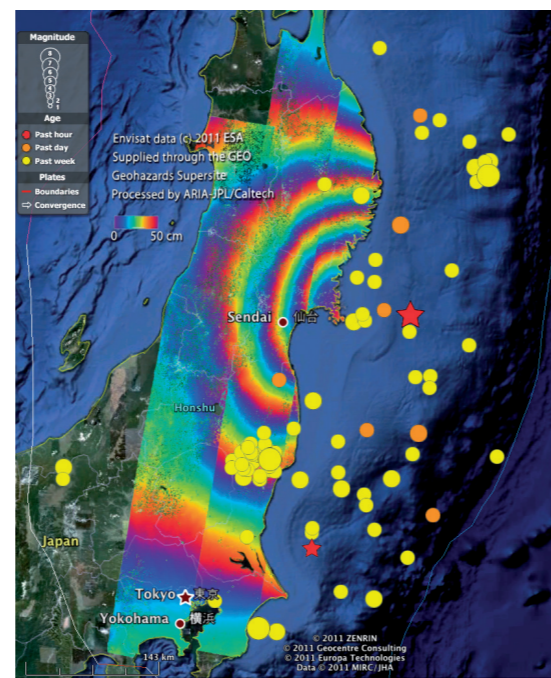
## → PROVIDING DATA FOR EMERGENCIES

In 2000, ESA was one of the founders of the 'International Charter Space and Major Disasters' to provide satellite data free of charge to those affected by disasters anywhere in the world.

ESRIN maintains a 24-hour operator service to take calls from authorised agencies wanting to activate the Charter. Available satellites are then programmed accordingly and begin gathering data that are used to generate emergency maps to provide rescue services with an overview of the current state of the area. Comparison of the maps from before and after any event allows the hardest hit areas as well

as passable routes for relief and rescue workers to be identified. They can also help to locate suitable areas for setting up aid camps where medical support and shelter can be provided.

ESRIN also contributes to many other international programmes and initiatives in the field of climate change, and support to UN Environmental Conventions and international initiatives, such as the International Geosphere-Biosphere Programme, the World Climate Research Programme, etc. It cooperates with international partners such as the World Bank and is actively involved in international committees such as GEO and CEOS.



## → VEGA: A SMALL LAUNCHER FOR EUROPE



Space agencies worldwide are giving preference to smaller satellite missions because they mean lower investments, shorter development time and produce high-priority, high-quality science in a shorter period.

“The key to successful small satellite programmes is low-cost, frequent access to space. This is where Vega comes in.”

– Stefano Bianchi, Head of Vega Programme

Vega will complement our Ariane 5 and Soyuz launchers and ensure independent space access for small missions. Designed to place 300–2000 kg satellites into a wide range of low-Earth orbits used for many scientific and Earth observation missions, the 30 m high launcher is small compared to the 53 m Ariane 5, but it is a major element of the European launcher strategy for access to space.

To open new market opportunities for European industry and maximise technological collaboration, Vega fosters international cooperation. It is being developed with the support of seven ESA Member States (Italy, France, Belgium, Switzerland, Spain, the Netherlands and Sweden).

The development of the launch system, including the launch vehicle and ground segment, is managed at ESRIN by an integrated project team that also includes staff of the Italian space agency (ASI) and the French space agency (CNES). The Vega ground segment is being developed at the European Spaceport at Kourou, French Guiana, benefiting from its exceptional location and existing launch infrastructure.

To allow a smooth transition between development and exploitation, the Vega Research and Technology Accompaniment (VERTA) programme, also based at ESRIN, is undertaking five flexibility demonstration flights primarily for ESA user missions.

# → INFORMATION TECHNOLOGY



Up-to-date, well-organised, secure and efficient information technology (IT) services are important for ESA, because they guarantee contact between our establishments, governments and industry in our Member States and space agencies worldwide.

ESRIN designs, develops and supports the infrastructure for communications, workplaces, hosting, storage, computing and information security that ensure all ESA establishments run smoothly and maintain identical high standards and interoperability.

The IT infrastructure is used by: sophisticated database systems for the collection, archiving, retrieval and distribution of information; financial management systems; corporate applications for personnel and facility management; and an information-system framework to manage ESA’s technological research programmes and knowledge base.

We also assist ESA Member State delegations by designing and implementing systems to store and retrieve official ESA documents and legal texts, electronically publish ESA tenders and support the acquisition of industrial products and services.

# → KEEPING ESA SECURE

ESRIN hosts the ESA Security Office that ensures the basic security capabilities and enables ESA to manage classified space programmes.

The activities include coordinating, supervising and controlling the implementation of all security measures related to personnel, documents, physical infrastructure and information and communications systems. As well as conducting threat and risk assessments, we monitor all local security incidents, liaise with national authorities and initiate actions across all ESA establishments. All security records and certificates in line with the corresponding national requirements are produced and kept here.



# → NEW WAYS TO STAY IN TOUCH



Telecommunications services provided via satellite – TV, phones and the Internet to name a few – have become part of our daily life, and new ways of using satellite telecommunications are emerging constantly.

To nurture projects trying to develop new applications in the fields of telemedicine, tele-education and risk management, ESA set up the ESRIN Telecom Lab. It supports European companies and institutions developing new space applications by providing easier

access to essential – but expensive – space telecommunications infrastructure.

Companies struggling to handle the transition phase from development to pilot operations are provided controlled access to a laboratory at ESRIN that offers uplink facilities and onsite support. This frees up their time and money, allowing them to concentrate on developing and marketing their core business.

ESRIN also organises demonstrations and runs independent system assessments to illustrate the benefits of telecommunications applications, facilitate links between application developers and potential users and assist new initiatives to reduce technical and operational risks.

# → GETTING YOUR BUSINESS OFF THE GROUND

Space technologies and, in particular, the constant stream of data from Earth observation satellites are not only useful for scientists, but also provide business opportunities for start-up companies and entrepreneurs.

Our Business Incubation Group works with the Business Innovation Centre (BIC) of Lazio to foster the creation of start-up companies whose business ideas derive from space technologies applied to other sectors

While BIC Lazio helps them develop business plans, identify partners, execute market promotion and provides them with economical and financial knowhow,



ESA provides expertise from experienced engineers and access to laboratories and test facilities, together with many international business contacts.

The initiative bridges the gap between an idea and an actual business by helping technology transfer projects and assisting their development into viable businesses.

## → KNOWLEDGE AND AWARENESS



### Preserving corporate memory

Established at ESRIN in 2002 with the mission to collect relevant documentation from all ESA establishments, the European Centre for Space Records (ECSR) appraises and preserves the valuable technical records of completed ESA projects together with their management archives. The ECSR also ensures that the invaluable knowledge and knowhow accumulated over the years is not lost, but preserved and transmitted for the benefit of the scientific and research community, industry and citizens of ESA Member States. By documenting our many achievements, ECSR guarantees that this information remains available for all those with a legitimate interest in Europe's space programmes.

### Increasing awareness of space

ESA strives to communicate and increase awareness of space and its benefits. ESRIN's Communication Office is key in this challenge, with its responsibility for online communication, ESA's Web Portal and Web 2.0 channels. It manages the public outreach for ESA in Italy, Greece and Romania and the Earth Observation and establishment communication. This office also coordinates printing and distribution of ESA promotional materials and conducts internal communication through our Intranet.

Explaining and understanding the practical uses of Earth observation data can be difficult. ESRIN's Virtual Reality Theatre transforms these datasets into 3D animations so they can be grasped more readily to understand how multiple datasets can be used to study complex interacting phenomena.

## → CONTACTING US



If you want to know more about ESRIN, please have a look at our web site, [www.esa.int/esrin](http://www.esa.int/esrin)



If you want to get in touch with ESRIN and ESA, please send your question to [contactesrin@esa.int](mailto:contactesrin@esa.int)

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