Enabling global user communities

Seamless collaboration to accelerate and enrich research and education

connect • communicate • collaborate

What is GÉANT?

GÉANT is the pan-European research and education network that interconnects Europe's National Research and Education Networks (NRENs). Together we connect over 40 million researchers and students across Europe, facilitating collaborative research in a diverse range of disciplines, including high-energy physics, radio astronomy, bio-medicine, climate change, earth observation and arts & culture.

GÉANT is part-funded by, and works in close cooperation with the European Commission (EC). GÉANT is fundamental to realising the EU's vision for the European Research Area (ERA), and is a key part of the Digital Agenda for Europe, a flagship initiative driving Europe 2020.

How does GÉANT help research communities?

In the digital age, technology underpins collaboration. It provides fast access to data stored across the globe, links researchers to instruments in real-time, allows the instant exchange of results and delivers the computing power needed to quickly analyse enormous volumes of data.

To deliver seamless collaboration, these Information and Communication Technology (ICT)-based resources are being organised into e-Infrastructures - platforms built around user needs. GÉANT and its NREN partners are at the heart of multiple e-Infrastructures, connecting over 8000 institutions in 40 countries via a backbone of high speed links which also connect a growing number of libraries, government departments, hospitals and museums.

And with many NRENs providing connectivity to primary and secondary education, over 20,000 schools are now benefitting from the power of GÉANT.

Building the internet of the Future

High speed networks and tailored services are at the heart of maintaining European competiveness, both within the research community and in creating new economic opportunities for business, public sector and individuals. The Future Internet Initiative (FII) brings together government and the ICT industry. A major component of the EC's Seventh Framework Programme (FP7), it funds projects and is influential in determining future ICT policy. GÉANT is fully involved in the FII, endorsing the overall vision and participating in a number of projects including the Infinity initiative, which looks at interoperability between emerging Future Internet infrastructures.

Creating integrated research infrastructures

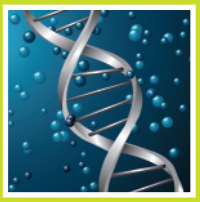
As well as its own technology research programmes, GÉANT works closely with ESFRI, the European Strategy Forum on Research Infrastructures to develop the scientific integration of Europe and strengthen international outreach through access to high quality research infrastructures.

Bioinformatics – empowering life sciences

Research breakthroughs such as DNA sequencing have transformed life sciences research, with data generated by biological experiments now doubling every five months. This makes distributing and sharing these enormous volumes of data to the global user community a major challenge.

Working together, GÉANT and its partner networks provide seamless, high-performance links between the EMBL-European Bioinformatics Institute (EMBL-EBI) in Cambridge and scientists located throughout the world, enabling real-time access to the world's largest collection of molecular databases.

The EBI would not exist without GÉANT, because our primary goal is to collect and distribute biological data... without GÉANT we could not do that.



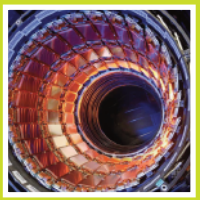
Professor Janet Thornton, Director of EMBL-EBI and Coordinator of ELIXIR

Recreating the Big Bang through high energy physics

Studying elementary particles through high energy physics dramatically improves our understanding of the world around us. As many of these particles can only be created through high energy collisions, the infrastructure needed to power these experiments is vast.

CERN's Large Hadron Collider (LHC), the world's largest scientific experiment, produces over 22 petabytes of data annually. Research networks, including GÉANT, are critical components in delivering experimental data to scientists all over the world.

We have used the GÉANT infrastructure very extensively... providing us with 10Gbps direct connections between CERN and the major institutes as well as a high performance IP service that allows us to get the data to and from the smaller institutes around Europe.



Dr David Foster, CERN

Real-time radio astronomy to chart the universe

Mankind has always been fascinated by the stars. By simultaneously observing the same region of sky through multiple telescopes around the world, the latest radio astronomy techniques provide us with the most detailed view yet of the universe. Sharing these enormous amounts of observational data previously involved shipping disks to a single location to compare information, making real-time observation impossible.

> **... working with networks such as GÉANT enables us to push back the frontiers of astronomy.**
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> *Dr Huib Jan van Langevelde, coordinator for the EXPReS project and director of JIVE*

The JIVE project uses GÉANT and other research networks to transmit data in real-time for central processing, allowing astronomers to chart previously unseen astronomical events. These networks will be central to the success of the Square Kilometre Array (SKA), the world's largest telescope due to be operational in 2020.

Earth Observation – saving lives through accurate weather forecasting

Monitoring and gathering information about our planet is central to building a better understanding of the key problems we face. New generations of real-time monitoring, such as satellite imaging and seismic probes used to address issues such as climate change and food production are producing an ever growing deluge of data that needs to be distributed around multiple locations.

To forecast typhoons the Philippine weather forecasting bureau PAGASA collaborates with its German counterpart, DWD, receiving accurate, real-time flow of meteorological data. Delivered through the high capacity GÉANT and Asian TEIN3 networks, this provides vital early warning of typhoons, enabling timely evacuations that save lives.

GÉANT

Further Information

Go online to learn more about GÉANT and keep up to date with the latest developments

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