



EGI Council Participant: CNRS

# Participating in EGI Impact Report: France

# 2023

[egi.eu](http://egi.eu)

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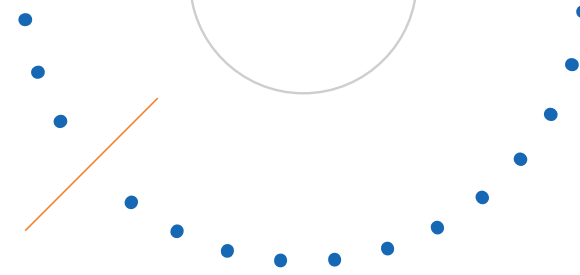
**25**  
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35 National institutional members of  
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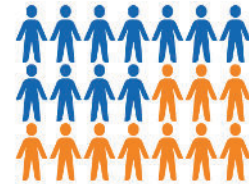
# Infographic



# Country overview

## +4,490 service users

In 2023, +4,490 researchers from French institutions used the services provided by the EGI Federation



## +960 publications

The research communities, projects and scientific collaborations from France supported by the EGI led to more than 960 peer-reviewed scientific publications

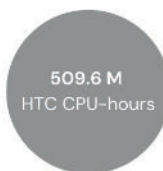
## 32 Supported communities

In 2023, the French infrastructure supported 32 research communities in the following disciplines: Agriculture, Climate Research, Health and Medicine, Linguistics, Physics



## Projects

French partners participate in 23 collaboration projects + EGI-ACE, iMagine and interTwin



Number of supported publications 966

Number of total service users 4497

Scientific Communities supported 32

Data Centres contributing to the Federation 11

Collaboration projects 23

Total HTC CPU hours delivered 509,686,809

Total Cloud CPU hours delivered 6,640,351

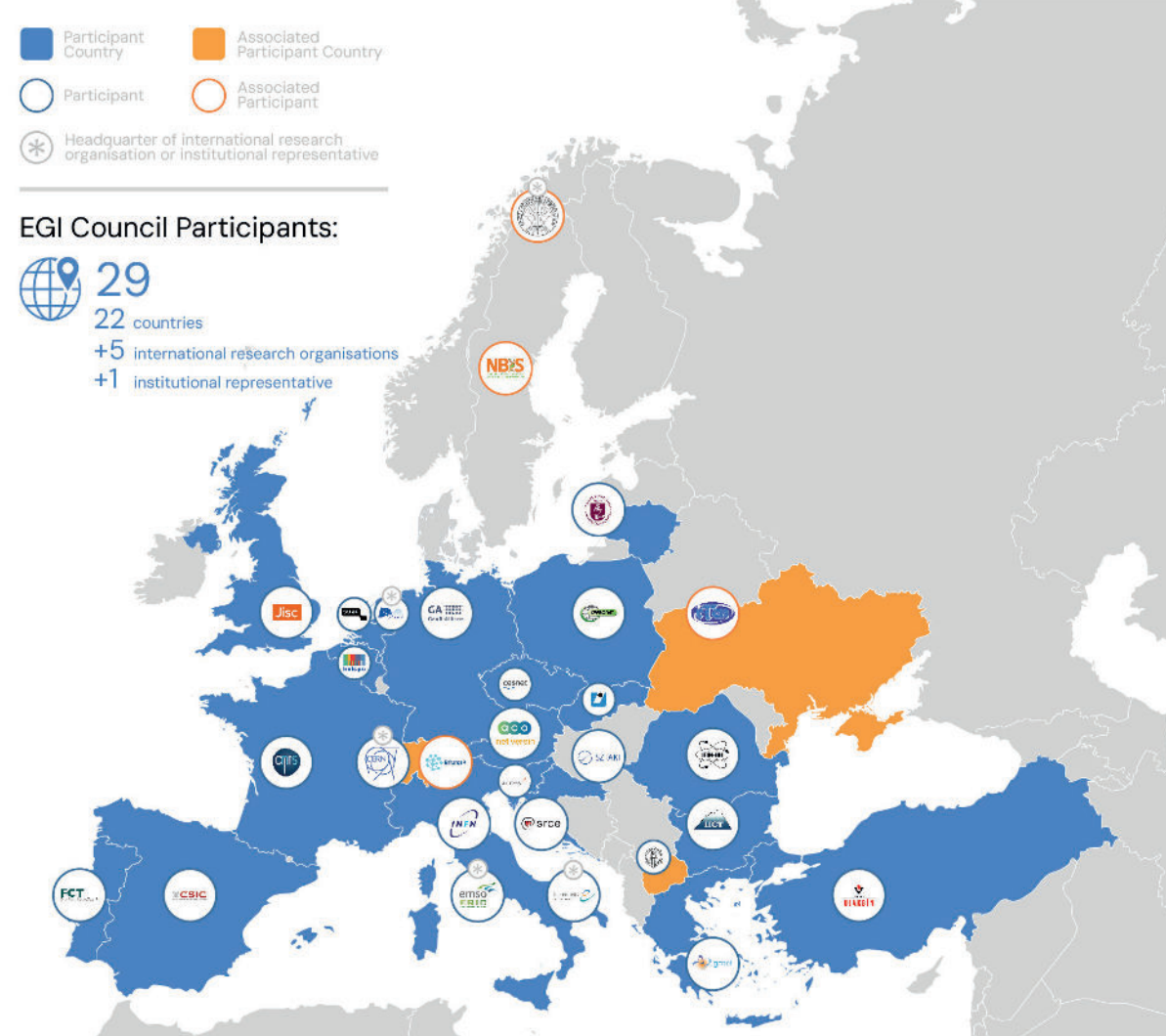
# About EGI

EGI is the federation of computing and storage resource providers united by a mission of delivering advanced computing and data analytics services for research and innovation.

The EGI Federation believes that all researchers should have seamless access to services, resources and expertise to collaborate and conduct world-class research and innovation. The EGI Federation is coordinated by EGI Foundation, an organisation with headquarters in Amsterdam. The Foundation offers a service federation and management platform, enabling the data centres to harmonise and integrate their services by connecting to a common hub. Moreover, it engages with international research communities using these services in order to understand and satisfy their demands for advanced computing for research.

The mission of EGI is pursued by coordinating and provisioning an international federated infrastructure that pools together service providers from both the public and private sectors in Europe to develop, integrate and deliver digital services for compute and data-intensive research and innovation. As an open initiative with a global outlook, the EGI Federation also connects service providers beyond Europe, following the collaboration needs of the served communities.

The latest Annual Report provides an extensive overview of the results that have been achieved through our collaborative efforts in 2023.



Approved EGI Council map from 2023



# About CNRS and France-Grilles

The French National Centre for Scientific Research (CNRS) is among the world's leading research institutions. Its scientists explore the living world, the matter, the Universe, and the functioning of human societies in order to meet the major challenges of today and tomorrow.

Internationally recognised for the excellence of its scientific research, the CNRS is a reference in the world of research and development, as well as for the general public

# Overall EGI impact

France Grilles coordinates the French participation to the EGI Federation; France Grilles is represented by CNRS in the EGI Council. France Grilles promotes the building and operation of a multidisciplinary national Distributed Computing Infrastructure open to all sciences and to developing countries in France. This report provides an overview of the activities of France Grilles in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by France Grilles to the EGI Foundation in 2023 was 90,000 EUR.

The EGI Federation is composed of e-infrastructure providers from national and community initiatives, forming one of the largest distributed computing infrastructures for researchers in the world, integrating about 1,243,400 CPU cores and over 1,4 Exabyte of storage space from hundreds of data centres.

In 2023, the EGI Federation served around 95,000 users (+12%) from over 260 research communities. EGI users consumed 7 Billion HTC CPU hours

(-1.04%), 12 Million Cloud CPU hours +17%), ran over 372 M computational jobs (+13.4%) and published over 2,900 open access publications.

As of the previous year, the research community with the largest number of users is Medical and Health Sciences (+43% annual increase in 2023), while the community with most extensive HTC CPU/h consumption is WLCG.

From the scientific communities engaged in 2023, the one with most extensive Cloud CPU/h consumption is Pangeo (+2959% annual increase in 2023).

Moreover, EGI engaged with a total of 265 scientific communities (10 new communities); 19 SMEs and business pilots, and 1 additional Research Infrastructure included in the ESFRI Roadmap, raising the total of number of ESFRI partners/users of EGI to 23.

# EGI contribution to France excellence in science

EGI federates hundreds of resource centres that are located at participant countries, organizations and at collaborating e-Infrastructures worldwide. This federated infrastructure supports data- and compute-intensive research across Europe and the world. In 2023, our federation was used by over 260 scientific communities, and has been accessed by around 95,000 users. Research Infrastructures and multi-national research collaborations are the largest adopters of EGI Services, the main contributors of thematic portals, and operate community-specific compute, storage and data systems based on EGI federation capabilities.

The services of the EGI federation have been used by 4497 researchers from France in 2023. The estimated annual scientific output in 2023 produced by research communities, projects and

scientific collaborations from France and supported by the EGI Federation is estimated to amount to almost 960 peer reviewed scientific publications.

The EGI Federation is currently working with over 40 Research Infrastructures, 32 of which include French partners. These EGI-enabled research infrastructures, their French members and their 2023 scientific output (publications) are detailed in the following pages of the report.

## French research collaborations in EGI

### AMS-02 (Particle Physics)

- LAPP Annecy
- LPSC Grenoble

### ALICE (High-Energy Physics)

- LPC Université Blaise Pascal Clermont-Ferrand II,
- LPSC Université Joseph Fourier, Grenoble
- Centre de Calcul-IN2P3, Lyon
- IPN Université Claude Bernard Lyon
- Université de Nantes,
- IJCLab Université Paris-Sud,
- CEA IRFU Saclay,
- IPHC Université de Strasbourg

### ATLAS (High-Energy Physics)

- LAPP, Université Grenoble Alpes, Université Savoie Mont Blanc, CNRS/IN2P3, Annecy
- LPC, Université Clermont Auvergne, CNRS/IN2P3, Clermont-Ferrand
- IRFU, CEA, Université Paris-Saclay, Gif-sur-Yvette
- LPSC, Université Grenoble Alpes, CNRS/IN2P3, Grenoble INP
- CPPM, Aix-Marseille Université, CNRS/IN2P3, Marseille
- IJCLab, Université Paris-Saclay, CNRS/IN2P3, 91405, Orsay
- LPNHE, Sorbonne Université, Université de Paris, CNRS/IN2P3, Paris

## EGI supported activities and services

The AMS-02 experiment on the International Space Station has been using compute resources from EGI for more than a decade. The services from the EGI federation that AMS-02 uses include:

- EGI HTC services from sites in Italy and CERN
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

ALICE has been supported since 2012 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered in the context of the WLCG MoU, including:

- Software support (consultancy to users and system administrators, (software maintenance and validation) Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

ATLAS has been supported since 2012 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered in the context of the WLCG MoU, including:

- Software support (consultancy to users and system administrators, (software maintenance and validation)
- Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

## Number of scientific papers published in 2023

3

65

111



## French research collaborations in EGI

### AUGER (Astronomy)

- Institut de Physique Nucléaire d'Orsay (IPNO)
- Laboratoire de Physique Nucléaire et de Hautes Energies (LPNHE),
- Univ. Grenoble Alpes, CNRS, Grenoble Institute of Engineering Univ. Grenoble Alpes

## EGI supported activities and services

The Pierre Auger Observatory has been using compute resources from EGI partners for more than a decade. The services of the EGI federation that the Auger observatory benefits from include:

- EGI HTC services from 9 EGI participant countries (CZ, DE, IT, FR, ES, NL, RO, PT, SI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

## Number of scientific papers published in 2023

8

### BELLE (High-Energy Physics)

- Institut Pluridisciplinaire Hubert Curien (IPHC) Strasbourg
- Irene Joliot-Curie Laboratoire des 2 Infinis (JCLab)
- Centre de Physique des Particules de Marseille

The BELLE experiment has been using compute resources from EGI partners since 2016. The services from the EGI federation that BELLE benefits from include:

- EGI HTC services from 9 EGI participant countries (CZ, DE, IT, FR, ES, NL, RO, PT, SI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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### BIOMED (Life Sciences)

- CNRS-IPHC
- CNRS-Creatis
- BME-IIT
- INSERM

The Life Science Grid Community is supported by EGI for more than one decade and have an Service Level Agreement since 2016. The EGI Services used by the community include:

- EGI Cloud services
- EGI Workload Manager
- From 2021 the community is one of the Data Space providers supported in the EGI-ACE Horizon 2020 project.

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## French research collaborations in EGI

### CLARIN (Linguistics)

- CNRS

## EGI supported activities and services

CLARIN thematic services has been supported by EGI since 2018. CLARIN has a Service Level Agreement with EGI, using the following services:

EGI services:

- EGI Cloud (Compute + Online Storage) for hosting the Virtual Language Observatory (VLO)
- Technical support
- Service integration

## Number of scientific papers published in 2023

38

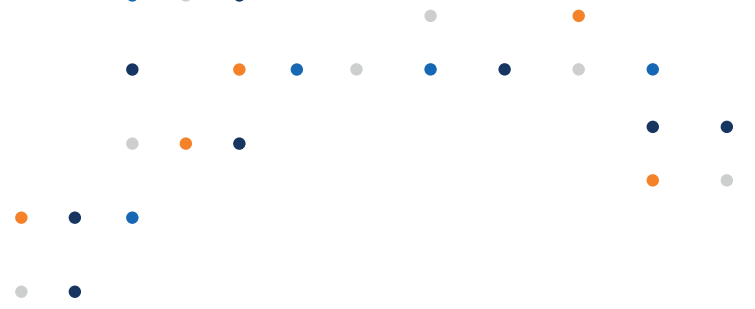
### CMS (High-Energy Physics)

- CMS (High-Energy Physics)
- IRFU, CEA, Université Paris-Saclay
- Institut Pluridisciplinaire Hubert Curien (IPHC), Université de Strasbourg
- Laboratoire Leprince-Ringuet, Ecole Polytechnique
- Centre de Calcul de l'Institut National de Physique Nucleaire et de Physique des Particules, CNRS/IN2P3
- Université de Lyon, Université Claude Bernard Lyon

CMS has been supported since 2012 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered in the context of the WLCG MoU, including:

- Software support (consultancy to users and system administrators, (software maintenance and validation)
- Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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## French research collaborations in EGI

## EGI supported activities and services

## Number of scientific papers published in 2023

### CTA (Astronomy)

- APC, Univ Paris Diderot, CNRS/IN2P3, CEA/Irfu, Obs de Paris, Sorbonne Paris Cité, France
- CEA/DSM/IRFU, CEA-Saclay
- Centre de Physique des Particules de Marseille (CPPM), Aix-Marseille Université, CNRS/IN2P3, Marseille
- Côte d'Azur Observatory
- Institut de Planétologie et d'Astrophysique de Grenoble, INSU/CNRS, Université Joseph Fourier
- Institut de Recherche en Astrophysique et Planétologie
- Laboratoire d'Annecy-le-Vieux de Physique des Particules, Université de Savoie, CNRS/IN2P3
- Laboratoire Leprince-Ringuet, École Polytechnique (UMR 7638, CNRS)
- Laboratoire Univers et Particules de Montpellier, Université Montpellier 2, CNRS/IN2P3
- LPNHE, University of Pierre et Marie Curie
- Observatoire de Paris, LUTH, CNRS, Université Paris Diderot
- Université Paris-Sud, Institut de Physique Nucléaire d'Orsay
- University of Bordeaux for the CENBG

The CTA experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that CTA uses include:

- EGI HTC services from 9 EGI participant countries (CZ, DE, IT, FR, ES, NL, RO, PT, SI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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### Comet.j-parc.jp (Physical Sciences)

- CC-IN2P3, Lyon, France
- Laboratoire de Physique Corpusculaire de Caen
- Laboratoire de Physique de Clermont
- Laboratory of Nuclear and High Energy Physics, Paris
- Institut de Physique des 2 Infinis de Lyon

The collaboration with EGI started back in 2015. The services from the EGI federation that the experiment uses include:

- EGI HTC services from 7 EGI federated sites from FR and UK
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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## French research collaborations in EGI

## EGI supported activities and services

## Number of scientific papers published in 2023

### COMPASS (Physical Sciences)

- Institute of Research into the fundamental laws of universe, IRFU

COMPASS has been supported since 2017 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered in the context of the WLCG MoU, including:

- Software support (consultancy to users and system administrators, (software maintenance and validation)
- Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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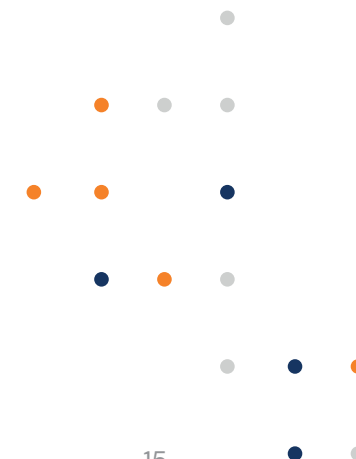
### DUNE (Astroparticle Physics)

- Astroparticule et Cosmologie – Université Paris Diderot (APC)
- Institut de Physique Nucléaire de Lyon (IPNL)
- Laboratoire d'Annecy-le-Vieux de Physique des Particules, CNRS/IN2P3 and Université de Savoie Mont Blanc (LAPP)
- Laboratoire de l'accélérateur linéaire (LAL)
- Laboratoire de Physique Subatomique et de Cosmologie, University of Grenoble Alpes/ CNRS/ Grenoble INP/ LPSC-IN2P3 (LPSC)
- Le centre Commissariat à l'énergie atomique Paris-Saclay (CEA/Saclay)

The DUNE experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that DUNE uses include:

- EGI HTC services from 6 EGI participant countries (CH, CZ, ES, FR, NL, UK)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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## French research collaborations in EGI

## EGI supported activities and services

Number of scientific papers published in 2023

### ELI-BEAM (Physical Sciences)

- CNRS-CEA;
- Pierre et Marie Curie University;
- Paris Sud University – France

ELI works with EGI since 2016 on exploring and validating approaches for off-site computing and data management. ELI-Beams setup a High Throughput Compute Service on EGI resources and works with EGI providers on

- Refining the user requirements and translating these to e-infrastructure requirements, and
- Identifying and validating services from EGI that can be relevant for ELI (besides HTC and compute).
- Mobilising already existing HTC compute, cloud compute and storage resources from EGI for ELI piloting and demonstration activities.

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### ELI-NP (Nuclear Physics)

- Institut de Physique Nucleaire, Orsay,
- IZEST Ecole Polytechnique , France;
- Centre National de la Recherche Scientifique / Commissariat a l'Energies Alternatives / L'Ecole Polytechnique / L'Institute d'Optique Graduate School / L'Universite de Paris Sud , France;
- Centre National de la Recherche Scientifique (LULI – Laboratoire d'Utilisation des Lasers Intenses), France

ELI has been working with EGI since 2016 on exploring and validating approaches for off-site computing and data management. ELI-NP setup a High Throughput Compute Service on EGI resources and works with EGI providers on:

- Refining the user requirements and translating these to e-infrastructure requirements, and
- Identifying and validating services from EGI that can be relevant for ELI (besides HTC and compute).
- Mobilising already existing HTC compute, cloud compute and storage resources from EGI for ELI piloting and demonstration activities

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### EMSO (Oceanography)

- IFREMER
- CNRS

EMPHASIS has been supported through the establishment of a Data Space in the EGI-ACE project. Since 2017 EMPHASIS using the following services from EGI:

- EGI Check-in
- EGI Cloud Compute
- EGI Online Storage
- EGI DataHub
- Technical support
- Software integration and piloting

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### PHASIS (Agriculture)

- INR

The collaboration with EGI started back in 2017 when 4 cloud providers of the EGI Federation agreed to support the EMSODEV project during the design and implementation of the EMSODEV Data Portal.

EMSO-ERIC setup the EMSO ERIC Data Management Platform on the EGI providers in order to harmonize the data sets following Oceansites specifications, FAIR principles, and EOSC guidelines.

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## French research collaborations in EGI

## EGI supported activities and services

Number of scientific papers published in 2023

### FUSION (Fusion)

- French Atomic Energy Commission (CEA)
- University of Strasbourg

The Fusion community has been using compute resources from EGI partners since 2018. The services from the EGI Federation used by the community include:

- EGI Cloud Compute
- EGI Online Storage

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### HESS (Astroparticle Physics)

- Laboratoire Univers et Particules de Montpellier, Université Montpellier
- APC, AstroParticule et Cosmologie, Université Paris Diderot, CNRS/IN2P3
- Laboratoire Leprince-Ringuet, Ecole Polytechnique
- LUTH, Observatoire de Paris
- LPNHE, Université Pierre et Marie Curie Paris
- DSM/Irfu, CEA Saclay, F-91191 Gif-Sur-Yvette Cedex, France
- Université Bordeaux 1, CNRS/IN2P3, Centre d'Etudes Nucleaires de Bordeaux Gradignan
- Laboratoire d'Annecy-le-Vieux de Physique des Particules, Université de Savoie
- Aix Marseille Université

The HESS experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that HESS uses include:

- EGI HTC services from 3 EGI participant countries (DE, FR, PL)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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### ILC (High-Energy Physics)

- Irfu – CEA/Saclay,
- IJCLab – CNRS/IN2P3,
- CPPM – CNRS/IN2P3,
- IJCLab – CNRS/IN2P3
- + many others

The ILC experiment has been using compute resources from EGI partners since 2004. The services from the EGI federation that ILC experiments uses include:

- EGI HTC services from 27 EGI federated sites from IL, DE, FR, ES, NL, PL, UK
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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## French research collaborations in EGI

### INSTRUCT (Structural Biology)

- Instruct Centre FR1
- Instruct Centre FR2
- IGBMC-CERBM

## EGI supported activities and services

The WeNMR structural biology community is supported by EGI since 2011 and have an Service Level Agreement since 2016. WeNMR is part of INSTRUCT and operates online Virtual Research Environments on top of the EGI services. The EGI Services used by the community include:

- High-Throughput, Cloud + Online Storage services from 23 EGI federated data centres from the Netherlands, Italy, France, Belgium, UK, Poland, the Asia Pacific region, IberGrid (Spain and Portugal), Italy, the Latin America region.
- EGI Workload Manager
- Trust and identity management with Check-in
- Technical support: WeNMR benefited from continual support through dedicated support activities in various EGI flagship projects: EGI-Engage, EOSC-hub and EGI-ACE.

## Number of scientific papers published in 2023

87

## French research collaborations in EGI

### LHcB (High-Energy Physics)

- Annecy-Le-Vieux, LAPP
- Clermont-Ferrand, LPC
- Paris, LPNHE
- Marseille, Univ. Aix-Mars. II/CPPM
- Orsay, IJCLab
- Laboratoire Leprince-Ringuet (LLR)

## EGI supported activities and services

LHcB has been supported since 2012 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federating services delivered in the context of the WLCG MoU, including:

- Software support (consultancy to users and system administrators, (software maintenance and validation)
- Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

## Number of scientific papers published in 2023

44

### JUNO (Neutrino Observatory)

- Centre d'Etudes Nucléaires de Bordeaux Gradignan
- Centre de Physique des Particules de Marseille
- Laboratoire des Physique des 2 Infinis Irène Joliot-Curie, Paris
- Institut Pluridisciplinaire Hubert Curien, Université de Strasbourg
- SUBATECH, CNRS/IN2P3, Université de Nantes, IMT Atlantique

The JUNO experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that JUNO uses include:

- EGI HTC services from 4 EGI federated data centres from France, Italy, Russia and China.
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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### LSST (Astronomy)

- Institut National de Physique Nucleaire et de Physique des Particules (IN2P3)

The LSST survey federates High Throughput Compute (HTC) resources from France and the UK and run an analysis campaign in 2020 to prepare for the opening of the Vera C. Rubin Observatory. The campaign consumed over 11 million CPU-hour in 2020 to analyse generated images, imitating the telescope images that are expected to become available from 2023. The LSST compute federation benefited from the following EGI services:

- Software support (consultancy to users and system administrators, (software maintenance and validation)
- Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI)
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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### KM3NET (Neutrino Observatory)

- Astroparticle and Cosmology Laboratory (APC).
- Centre for Particle Physics of Marseille (CPPM),
- Institut Pluridisciplinaire Hubert Curien (IPHC),
- Université de Strasbourg,
- Université de Haute Alsace,
- Mediterranean Institute of Oceanography (MIO)
- SUBATECH research laboratory
- University of Montpellier
- LPC Caen

The Km3Net experiment has been using compute resources from EGI partners since 2013. The services from the EGI federation that Km3Net uses include:

- EGI HTC services from 2 EGI federated sites from IT and PL
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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## French research collaborations in EGI

### MINKE (Oceanography)

- IFREMER
- SERVICE HYDROGRAPHIQUE ET Océanographique DE LA MARINE
- UNIVERSITÉ AIX-MARSEILLE
- LABORATOIRE NATIONALE DE METROLOGIE ET D'ESSAIS

## EGI supported activities and services

The collaboration with EGI started back in 2021. The services from the EGI federation that the experiment uses include:

- EGI HTC services from 1 EGI federated site from ES
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

## Number of scientific papers published in 2023

0

### NA62 (High-Energy Physics)

- Centre National de la Recherche Scientifique,
- Centre de Physique de Particules de Marseille CPPM

The NA62 experiment has been using compute resources from EGI partners since 2012. The services from the EGI federation that NA62 uses include:

- EGI HTC services from sites in the UK, Italy, Belgium and CERN
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

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### OPENCoastS (Ocean Engineering)

- CNRS-UR

OPENCoastS has been using compute resources from EGI partners since 2018. The services from the EGI federation that OPENCoastS uses include:

- EGI Cloud services from 2 EGI federated sites from ES and PT
- EGI AAI Check-in

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### PANOSC (Photon and Neutron)

- ESRF – European Synchrotron Radiation Facility,
- Institut Laue-Langevin (ILL)

PANOSC has been using compute resources from EGI partners since 2018. The services from the EGI federation that PANOSC uses include:

- EGI Cloud services from 2 EGI federated data centres from CZ and DE
- EGI AAI Check-in
- EGI Notebooks
- EGI DataHub

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## French research collaborations in EGI

### SeaDataNet

- IFREMER Institut Français de Recherche pour l'Exploitation de la MER

## EGI supported activities and services

SeaDataNet has been supported by EGI partners in the EOSC-hub project in the setup and validation of a data access service on federated cloud resources. Since 2021 the SeaDataNet community is represented in the EGI Council by MARIS, and works with several EGI members in the EGI-ACE Horizon 2020 project. In EGI-ACE, SeaDataNet and EGI partners from Spain are setting up and operating a WebOcean Data Analysis service in the EGI cloud federation, and deliver the service in EOSC.

## Number of scientific papers published in 2023

0

### SKA (Radioastronomy)

- National Center for Scientific Research

The Square Kilometre Array (SKA) is an intergovernmental radio telescope project being planned to be built in Australia and South Africa. 8 countries that participate in SKA are also represented in the EGI Council (France, 2023y, Italy, Portugal, Spain, Switzerland, The Netherlands and the United Kingdom). Between 2017–2019 SKA worked with the EGI federation in the AENEAS Horizon 2020 project. The collaboration resulted in recommendations on how to:

- organize federated service management within the SKA European Science Data Centre (ESDC) and across multiple SKA Regional Centres to address the management of the SKA community-specific services.
- federate the ESDC services with existing e-Infrastructure federated services (Identity Provisioning, Authentication and Authorization, tools for federated service management)
- collect SKA and e-Infrastructures requirements to federate and eventually enhance existing federation services.

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## French research collaborations in EGI

### Solid Experiment (High-Energy Physics)

- LPC Caen, ENSICAEN, Université de Caen, CNRS/IN2P3
- SUBATECH, CNRS/IN2P3, Université de Nantes
- LAL, Univ Paris-Sud, CNRS/IN2P3, Université Paris-Saclay
- LPC Clermont, CNRS/IN2P3, Université Clermont Auvergne

## EGI supported activities and services

The collaboration with EGI started back in 2017. The services from the EGI federation that the experiment uses include:

- EGI HTC services from 2 EGI federated sites from BE and UK
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

## Number of scientific papers published in 2023

0

### VIRGO (Astrophysics)

- Centre national de la recherche scientifique
- Artemis, Université Côte d'Azur, Observatoire de la Côte d'Azur, CNRS
- ESPCI, CNRS
- GiPSA-Lab
- Grand Accélérateur National d'Ions Lourds
- Institut des Hautes Etudes Scientifiques
- Institut des Nanosciences de Paris
- Institut des Nanotechnologies de Lyon
- Institut d'Astrophysique de Paris
- Institut Fresnel, Aix Marseille Université, CNRS, Centrale Marseille
- L2IT, Laboratoire des 2 Infinis - Toulouse, Université de Toulouse, CNRS/IN2P3, UPS
- Laboratoire Kastler Brossel, Sorbonne Université, CNRS
- Laboratoire Lagrange, Université Côte d'Azur, Observatoire Côte d'Azur, CNRS
- Laboratoire Univers et Théories
- NAVIER
- Observatoire de Paris
- + many others

The Virgo experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that VIRGO uses include:

- EGI HTC services from 8 data centres from France, Italy, The Netherlands, Spain and UK
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)
- Since 2021 Virgo works with EGI in the EGI-ACE Horizon 2020 project to evaluate and adopt data analysis, federated authentication-authorisation and data management services for thematic applications.

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## French research collaborations in EGI

### WeNMR (Structural Biology)

- CNRS - UNIVERSITY PARIS SACLAY
- ANSES - FRENCH AGENCY FOR FOOD, ENVIRONMENTAL AND OCCUPATIONAL HEALTH & SAFETY
- INSTITUTE FOR ADVANCED BIOSCIENCES
- UNIVERSITÉ DE RENNES
- Institute PASTEUR
- Institute of Analytical Sciences
- Ecole Polytech
- European Institute of Chemistry and Biology
- Mitovsac
- IPBS
- Université de Paris
- CRI
- INSTITUT DE BIOLOGIE STRUCTURALE
- SORBONNE UNIVERSITY
- ICOA
- CANTHER
- IBMC
- INRAE
- and many others

## EGI supported activities and services

WeNMR is supported by EGI since 2011 and has a Service Level Agreement since 2016. The EGI Services used by the community include:

- High-Throughput, Cloud + Online Storage services from 23 EGI federated sites from the Netherlands, Italy, France, 2023y, UK, Poland, the Asia Pacific region, IberGrid (Spain and Portugal), Italy, the Latin America region.
- EGI Workload Manager
- Trust and identity management with Check-in
- Technical support: WeNMR benefited from continual support through dedicated support activities in various EGI flagship projects: EGI-Engage, EOOSC-hub and EGI-ACE.

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### XENON (Dark Matter Physics)

- Laboratoire de l'Accélérateur Linéaire,
- Laboratoire de Physique Nucléaire et de Hautes Energies
- Subatech, Nantes

The XENON experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that XENON uses include:

- EGI HTC services from 4 EGI federated data centres from France, Italy, the Netherlands and Israel
- Software distribution services (UMC, CMD, operations documentation)
- Operations coordination (middleware deployment campaigns, procedures, innovation of tools)
- Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)

7

# Service Level Agreements

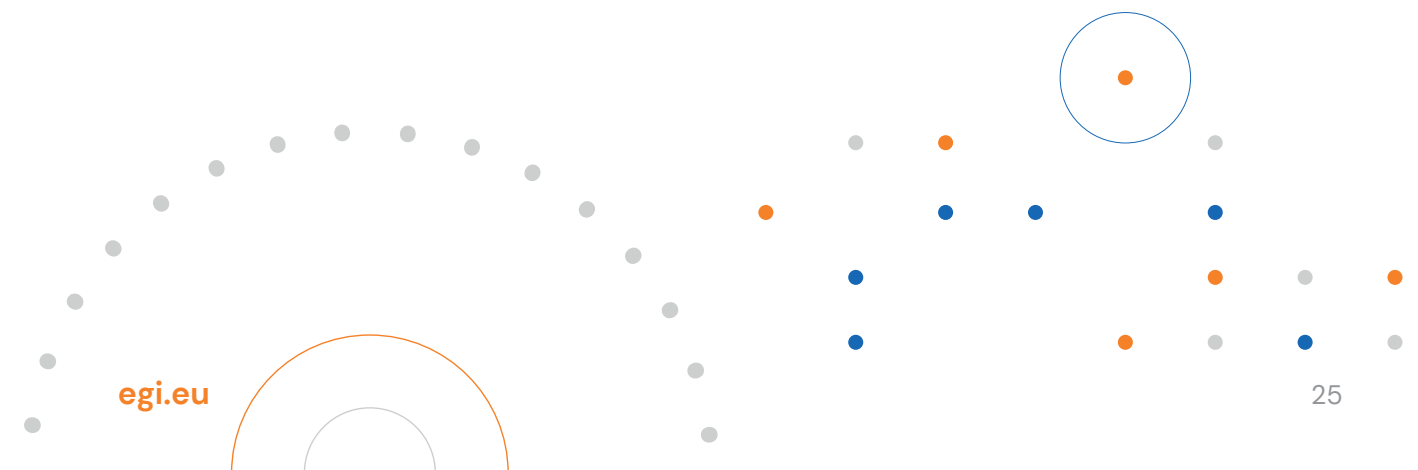
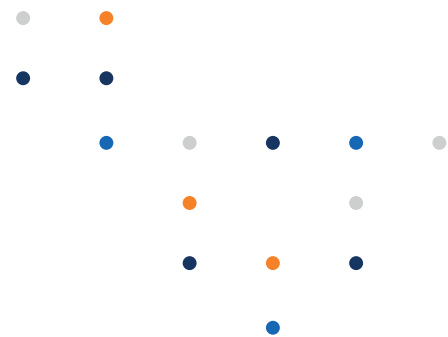
During 2023, French providers including CNRS, IN2P3-CPPM, CREATIS-INRA-LYON, IN2P3-IRES, GRIF, and UNIV-LILLE supported 14 Service Level Agreement for international scientific communities via EGI, delivering Cloud Computing, Online Storage, HTC and Workload Manager services.

# Participated projects

The EGI Foundation coordinated one Horizon 2020 project, EGI ACE (January 2021-June 2023). Moreover, it leads two Horizon Europe Projects, iMagine (September 2022-December 2025) and interTwin (September 2022-August 2025).

Furthermore, the EGI Federation was involved in 8 additional projects, increasing the innovation potential of its participants.

The EGI Federation participates in Horizon 2020 and Horizon Europe projects together with French institutions to facilitate the uptake and use of e-infrastructure services for science. A summary of these projects, the involved institutes and the scope of the collaborations is provided in the next table.



**Project title Scope of collaboration**

**Participating beneficiaries from the country**



EGI is contributing to the architectural design and implementation of open distributed software to ensure that AI4Europe evolves as a distributed ecosystem. EGI is also providing its expertise on physical resources, usability, development of systems, distributed systems and new technologies to develop mechanisms for the AI tools to deploy/make use of private/public Cloud and HPC resources.

- Université Paris Cité



EGI contributes with the services Cloud computing, Notebooks and Applications on demand, FTS, data archiving. It participates to the EOSC Integration processes and the sustainability business plan.

- EMBRC
- CNRS



EGI contributes with the services Cloud computing, Notebooks and Applications on demand, FTS, data archiving. It participates to the EOSC Integration processes and the sustainability business plan.

- IFREMER
- MERCATOR OCEAN
- SORBONNE UNIVERSITE
- IRD
- EMBRC
- IEEE FRANCE SECTION
- POKAPOK
- OceanScope



EGI coordinates the task dedicated to the Single Sign-On access with the EGI Check-in service.

- ESF European Science Foundation
- UNIVERSITE D'AIX MARSEILLE



EGI leads the processes related to setup and operate of testbed infrastructure, the Edge/cloud/HPC orchestration, to secure resource access and user management. It also works on the commercial exploitation and sustainability plan and on dissemination activities..

- 3d Medlab
- Montimage Eurl

**Project title Scope of collaboration**

**Participating beneficiaries from the country**



EGI contributes to EOSC-LIFE by supporting the creation and operation of a life science AAI (LS AAI) that is fully interoperable with the EOSC AAI.

- ECRIN European Clinical Research Infrastructure Network
- EMBRC
- INRAE
- Sorbonne Université
- INSERM
- CERMB-GIE



EGI contributed to the design, operation and interoperability of EOSC Core services, to running the EOSC Digital Innovation Hub, as well as to resource strategy and the processes for onboarding new groups to EOSC. EGI was responsible for requirements collection and analysis for both the EOSC Back Office and Front Office. It also leads all operational aspects of the EOSC Portal. Finally, EGI played a leading role in developing the EOSC SMS.

- CNRS
- DARIAH
- ESRF
- INSTITUT MAX VON LAUE – PAUL LANGEVIN
- ECRIN European Clinical Research Infrastructure Network
- EMBRC



EGI contributes to the project activities related to innovation management, policy development, and project activities and results communications and dissemination.

- IRD/LEGOS Institut de Recherche pour le Développement



EGI contributes to the Federation sustainability model and the expansion of the DIH ecosystem. Moreover, it collaborates to the development and maintenance of the service catalogue, to the training programme, and to the dissemination and outreach of the project activities and results.

- IMT Transfert



Within EUCAIM, EGI works on the development of the platform core services in addition to supporting the creation of the platform central storage and infrastructure. Moreover, EGI leads the activities around the design and implementation of a federated learning and data analysis infrastructure, and ensures access to HPC/Cloud resources across Europe.






- Collège des Enseignants en Radiologie de France
- CNRS
- French Institute for Research in Computer Science and Automation
- LIMICS
- Medexprim
- Owkin



EGI Foundation collaborates to the definition of the technical requirements, to the authentication and authorisation infrastructure of the project, and will support the project services onboarding to the EOSC Marketplace.

- Bibracte EPCC



Project title	Scope of collaboration	Participating beneficiaries from the country
	EGI leads the development of new functionality to bring support for new computing and storage systems and to deliver meta scheduling of computing jobs in a distributed infrastructure delivered by EOSC providers and beyond. EGI also leads the activities for the development of a sustainability model to maximize the project and collaborates in the activities to integrate EuroScienceGateway in EOSC.	<ul style="list-style-type: none"> <li>• CNRS</li> <li>• Université Paris Cité</li> </ul>
	EGI contributes to the definition of requirements, metrics, specifications and pilots for the assessment of thematic services and platforms	<ul style="list-style-type: none"> <li>• INRAE</li> <li>• INRIA</li> </ul>
	EGI Foundation leads the task on the analysis of the existing computation infrastructures with a special view on health research and will propose a reference architecture for computational services to serve the Health Research and Innovation Cloud ecosystem.	<ul style="list-style-type: none"> <li>• ECRIN European Clinical Research Infrastructure Network</li> </ul>
	EGI works on the deployment and operation of a FAIR federated data repository, promoting enhanced exploitation of project outputs (data and results). It also provides expertise in order to formulate a strategy regarding data preservation. In particular, EGI will implement a DataHub and a Data preservation service for the project.	<ul style="list-style-type: none"> <li>• Sorbonne Université</li> <li>• CNRS</li> </ul>
	In the project, EGI co-designs and deploys AI models on edge resources, enhancing capacity through its federation's computational and storage resources. EGI expands resource allocations, provides a two-tier e-infrastructure for validation and large-scale data processing, and ensures sustainable setups by coordinating national funding. EGI addresses data management challenges, integrates distributed storage solutions, and connects PHENET with the European Open Science Cloud.	<ul style="list-style-type: none"> <li>• INRAE</li> <li>• INRAE Transfert SAS</li> <li>• UNIVERSITE D'ANGERS</li> <li>• GROUPE D'ETUDE ET DE CONTROLE DES VARIETES ET DES SEMENCES</li> <li>• HIPHEN</li> <li>• GEOSYS</li> <li>• UNIVERSITE D'AIX MARSEILLE</li> <li>• C.I.R.A.D. EPIC</li> <li>• ANALYSIS AND EXPERIMENTATION ON ECOSYSTEMS ERIC</li> </ul>

Project title	Scope of collaboration	Participating beneficiaries from the country
	The EGI Foundation supports the project in defining interoperability standards among the participating facilities, and with the broader landscape, including EOSC, and leads the design of sustainable services and activities that will last beyond the project. EGI members deliver a federated cloud environment with a cloud-based 'EGI Notebooks' service for the PITHIA e-science centre to offer a scalable and customisable web environment for writing workflows, exchanging workflows, accessing, analysis and sharing of data.	<ul style="list-style-type: none"> <li>• Université Paul Sabatier Toulouse III</li> <li>• Watermann Jurgen</li> <li>• Centre National d'Etudes Spatiales – CNES</li> </ul>
	EGI contributes supporting HPC, Cloud and Edge, and to to the strategic engagement with the European AI Ecosystem and connected communities.	<ul style="list-style-type: none"> <li>• HUB FRANCE IA</li> </ul>
	EGI is one of the main contributors to the design and definition of the EOSC architecture and the federated service management framework, and coordinates service pilots participates by the scientific demonstrators. EGI also contributed to the definition of the governance framework and to the works on Rules of Participation. In the project EGI will enhance the SoBigData platform with two services: Jupyter Notebooks and the Workflow manager Galaxy	<ul style="list-style-type: none"> <li>• Ecole d'Economie de Paris</li> <li>• CNRS</li> </ul>
	EGI leads the work on Services Provision, which collects information about the services that the RI can provide and creates a plan for a unified single access point RI, including access policies for the distributed resources. EGI also contributes to the development of the financial aspect of the future RI, defines the business cases and the cost book, supports the strategy and enhance the impact of the RI, contributes to the Dissemination and Communication plans (WP5), and to the creation of the Italian central Hub for the preparation phase.	<ul style="list-style-type: none"> <li>• Ecole d'Economie de Paris</li> </ul>
	The EGI Foundation is leading the technical requirements, service layer design and integration with the platform defining and describing. Additionally, EGI Foundation participates to build Vertical Matchmaking and hardware marketplace and to Open Call Management.	<ul style="list-style-type: none"> <li>• Thales Six Gts France SAS</li> </ul>

## Project title Scope of collaboration

## Participating beneficiaries from the country



EGI contributes to the GAP analysis, User needs and requirements, Definition of System Requirements and Technical Specifications, and Security, in addition to the Self-sovereign Identity Management and Dissemination and Communication. EGI coordinates the task dedicated to Policy recommendations on Distributed Infrastructures, Secure Data Exchange & Data Spaces.

- CEA

# Infrastructure contributions

The EGI Federation offers two complementary compute capabilities: the High-Throughput Compute (HTC) federation and the Cloud federation. 17 French data centres contribute to these federations:

### HTC Federation:

- AUVERGRID (Clermont University)
- CREATIS-INSA-LYON (Universite de Lyon, CREATIS biomedical imaging research laboratory)
- GRIF (GRIF: Grille de Recherche d'Ile de France)
- IN2P3-CC (IN2P3, Lyon)
- IN2P3-CPPM (Centre de Physique des Particules de Marseille)
- IN2P3-IPNL (Institut de Physique des 2 Infinis de Lyon, CNRS)
- IN2P3-IRES (Institut Pluridisciplinaire Hubert Curien)
- IN2P3-LAPP (Laboratoire d'Annecy de Physique des Particules)
- IN2P3-LPC (IN2P3-LPC, Clermont-Ferrand)

### Cloud Federation:

- IN2P3-IRES (Institut Pluridisciplinaire Hubert Curien)
- UNIV-LILLE (Universite de Lille)

The data centres provided 66 service endpoints and delivered 509,686,809 CPUhours in total to EGI communities in 2023. The data centres responded

to 237 support tickets through the EGI Helpdesk. The most active international user groups of the French compute resources were:

- ATLAS 51.54%
- CMS 19.46%
- LHCB 17.3%,
- ALICE 9.01%
- BIOMED 0.83%
- BELLE 0.62%

With the help of the EGI Security Vulnerability Group, the French sites avoided 44 critical vulnerabilities in foundational software systems during 2023.

# Methodology

Data for this impact report has been collected from the following sources.

- Infrastructure contributions, infrastructure usage by research communities: [EGI Accounting System](#)
- List of research publications by supported research communities (table 1)

<b>AMS-02</b> <a href="https://ams02.space/publications">https://ams02.space/publications</a>	<b>ILC</b> <a href="https://inspirehep.net/literature?sort=mostrecent&amp;size=25&amp;page=1&amp;q=international%20Linear%20Collider%20&amp;earliest_date=2021--2021">https://inspirehep.net/literature?sort=mostrecent&amp;size=25&amp;page=1&amp;q=international%20Linear%20Collider%20&amp;earliest_date=2021--2021</a>
<b>ALICE</b> <a href="https://alice-publications.web.cern.ch/publications">https://alice-publications.web.cern.ch/publications</a>	<b>INSTRUCT</b> <a href="https://instruct-eric.eu/content/publications-list">https://instruct-eric.eu/content/publications-list</a>
<b>ATLAS</b> <a href="https://cds.cern.ch/collection/ATLAS%20Papers?ln=en">https://cds.cern.ch/collection/ATLAS%20Papers?ln=en</a>	<b>JUNO</b> <a href="https://inspirehep.net/">https://inspirehep.net/</a>
<b>AUGER</b> <a href="https://www.auger.org/science/publications/journal-articles">https://www.auger.org/science/publications/journal-articles</a>	<b>KM3NET</b> <a href="https://www.km3net.org/about-km3net/publications/publication/">https://www.km3net.org/about-km3net/publications/publication/</a> ; <a href="https://inspirehep.net/literature?q=collaboration:KM3NeT_year:2021">https://inspirehep.net/literature?q=collaboration:KM3NeT_year:2021</a>
<b>BELLE</b> <a href="https://belle.kek.jp/belle/publications.html">https://belle.kek.jp/belle/publications.html</a> ; <a href="https://inspirehep.net/literature?q=collaboration:belle_year:2021">https://inspirehep.net/literature?q=collaboration:belle_year:2021</a>	<b>LifeWatch</b> <a href="https://www.lifewatch.eu/catalogue-of-virtual-labs/medobis/publications/">https://www.lifewatch.eu/catalogue-of-virtual-labs/medobis/publications/</a>

<b>BIOMED</b> <a href="https://vip.creatis.insa-lyon.fr/documentation/">https://vip.creatis.insa-lyon.fr/documentation/</a>	<b>LOFAR</b> <a href="http://old.astron.nl/radio-observatory/lofar-science/lofar-papers/lofar-papers">http://old.astron.nl/radio-observatory/lofar-science/lofar-papers/lofar-papers</a> ; <a href="https://lofar-surveys.org/publications.html">https://lofar-surveys.org/publications.html</a> , or <a href="https://ui.adsabs.harvard.edu/search?q=full%3A(%22designed%20and%20constructed%20by%20ASTRON%22)%20OR%20title%3A%22LOFAR%22%20year%3A2021-2021%20property%3Arefereed%20-bibstem%3A(%22AN%22%20OR%20%22MNRAS,tmp%22)&amp;sort=date%20desc%2C%20bibcode%20desc&amp;p_0">https://ui.adsabs.harvard.edu/search?q=full%3A(%22designed%20and%20constructed%20by%20ASTRON%22)%20OR%20title%3A%22LOFAR%22%20year%3A2021-2021%20property%3Arefereed%20-bibstem%3A(%22AN%22%20OR%20%22MNRAS,tmp%22)&amp;sort=date%20desc%2C%20bibcode%20desc&amp;p_0</a>
<b>CTA</b> <a href="https://www.cta-observatory.org/science/library/">https://www.cta-observatory.org/science/library/</a>	<b>LCHb</b> <a href="https://cds.cern.ch/collection/LHCb%20Papers?ln=en">https://cds.cern.ch/collection/LHCb%20Papers?ln=en</a>
<b>CLARIN</b> <a href="https://beta.clarin.openaire.eu/search/advanced/research-outcomes?sortBy=resultdateofacceptance,descending&amp;type=publications&amp;year=range2021:2021">https://beta.clarin.openaire.eu/search/advanced/research-outcomes?sortBy=resultdateofacceptance,descending&amp;type=publications&amp;year=range2021:2021</a>	<b>LSST</b> <a href="https://ui.adsabs.harvard.edu/?with_year:2021+author:(%22LSST%22+OR+%22Vera+C.+Rubin%22)+collection:astronomy+property:refereed">https://ui.adsabs.harvard.edu/?with_year:2021+author:(%22LSST%22+OR+%22Vera+C.+Rubin%22)+collection:astronomy+property:refereed</a>
<b>CMS</b> <a href="http://cms-results.web.cern.ch/cms-results/public-results/publications/CMS/index.html">http://cms-results.web.cern.ch/cms-results/public-results/publications/CMS/index.html</a>	<b>NA62</b> <a href="https://cds.cern.ch/collection/NA62%20Papers?ln=en">https://cds.cern.ch/collection/NA62%20Papers?ln=en</a>
<b>DUNE</b> <a href="https://inspirehep.net/literature?q=collaboration:DUNE_year:2021">https://inspirehep.net/literature?q=collaboration:DUNE_year:2021</a>	<b>OPENCOASTS</b> <a href="http://opencoasts.lnec.pt/index_en.php">http://opencoasts.lnec.pt/index_en.php</a>
<b>EISCAT_3D</b> <a href="https://eiscat.se/scientist/publications/">https://eiscat.se/scientist/publications/</a>	<b>PANOSC</b> <a href="https://www.panosc.eu/publications/">https://www.panosc.eu/publications/</a>



# National institutional members of supported research communities (table 2)

<b>ELI-BEAM</b> <a href="https://www.eli-beams.eu/publikace/">https://www.eli-beams.eu/publikace/</a>	<b>SeaDataNet</b> <a href="https://www.seadatanet.org/Publications/Scientific-publications">https://www.seadatanet.org/Publications/Scientific-publications</a>
<b>ELI-NP</b> <a href="https://www.eli-np.ro/scientific_papers.php">https://www.eli-np.ro/scientific_papers.php</a>	<b>SKA</b> <a href="https://ui.adsabs.harvard.edu/search/fq=%7B!type%3D%20v%3D%24fq_database%7D&amp;fq_database=database%3A%20astronomy&amp;q=pubdate%3A%5B2021-01%20TO%202021-12%5D%20title%3A(SKA)&amp;sort=date%20desc%2C%20bibcode%20desc&amp;p_ =0">https://ui.adsabs.harvard.edu/search/fq=%7B!type%3D%20v%3D%24fq_database%7D&amp;fq_database=database%3A%20astronomy&amp;q=pubdate%3A%5B2021-01%20TO%202021-12%5D%20title%3A(SKA)&amp;sort=date%20desc%2C%20bibcode%20desc&amp;p_ =0</a>
<b>EMSO-ERIC</b> from the community representative; SLA <a href="https://documents.egi.eu/document/3539">https://documents.egi.eu/document/3539</a>	<b>SNO+</b> <a href="https://snoplus.phy.queensu.ca/results/collaboration-papers.html">https://snoplus.phy.queensu.ca/results/collaboration-papers.html</a>
<b>FUSION</b> <a href="https://documents.egi.eu/public/ShowDocument?docid=3484">https://documents.egi.eu/public/ShowDocument?docid=3484</a>	<b>VIRGO</b> <a href="https://pnp.ligo.org/ppcomm/Papers.html">https://pnp.ligo.org/ppcomm/Papers.html</a>
<b>HESS</b> <a href="https://www.mpi-hd.mpg.de/hfm/HESS/pages/publications/">https://www.mpi-hd.mpg.de/hfm/HESS/pages/publications/</a>	<b>WeNMR</b> <a href="https://explore.openaire.eu/">https://explore.openaire.eu/</a> advanced search project outcomes. field to search "project" enter project name; Citation of HADDOCK web server: <a href="https://scholar.google.nl/scholar?hl=en&amp;as_sdt=2005&amp;cites=10355645612647046441&amp;scipsc=&amp;as_ylo=2021&amp;as_yhi=2021">https://scholar.google.nl/scholar?hl=en&amp;as_sdt=2005&amp;cites=10355645612647046441&amp;scipsc=&amp;as_ylo=2021&amp;as_yhi=2021</a> ; Citations of the AMBER web portal publication: <a href="https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=0.5&amp;scioldt=0.5&amp;cites=6696812766870837905&amp;scipsc=">https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=0.5&amp;scioldt=0.5&amp;cites=6696812766870837905&amp;scipsc=</a> ; Citations of the FANTEN web portal publication: <a href="https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=0.5&amp;scioldt=0.5&amp;cites=10578718345045994565&amp;scipsc=">https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=0.5&amp;scioldt=0.5&amp;cites=10578718345045994565&amp;scipsc=</a> ; Citations of the DISVIS/POWERFIT web portals publication: <a href="https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=2005&amp;cites=6482114501244947208&amp;scipsc=">https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=2005&amp;cites=6482114501244947208&amp;scipsc=</a> ; Citations of the SpotON web portal: <a href="https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=2005&amp;cites=6482114501244947208&amp;scipsc=">https://scholar.google.com/scholar?as_ylo=2021&amp;hl=en&amp;as_sdt=2005&amp;cites=6482114501244947208&amp;scipsc=</a>
<b>Ice-Cube</b> <a href="https://icecube.wisc.edu/science/publications/">https://icecube.wisc.edu/science/publications/</a>	<b>XENON</b> <a href="https://inspirehep.net/literature?q=collaboration:XENON&amp;year:2021">https://inspirehep.net/literature?q=collaboration:XENON&amp;year:2021</a>

<b>AMS-02</b> <a href="https://ams02.space/collaboration/institute">https://ams02.space/collaboration/institute</a>	<b>ILC</b> <a href="https://linearcollider.org/team/">https://linearcollider.org/team/</a>
<b>ALICE</b> <a href="https://alice-collaboration.web.cern.ch/General/Members/List_Institutes.html">https://alice-collaboration.web.cern.ch/General/Members/List_Institutes.html</a>	<b>INSTRUCT</b> <a href="https://instruct-eric.eu/countries">https://instruct-eric.eu/countries</a>
<b>ATLAS</b> <a href="https://atlas.cern/discover/collaboration">https://atlas.cern/discover/collaboration</a>	<b>JUNO</b> <a href="https://juno.ihep.ac.cn/collaboration.php">https://juno.ihep.ac.cn/collaboration.php</a>
<b>AUGER</b> <a href="https://www.auger.org/collaboration/institutions">https://www.auger.org/collaboration/institutions</a> , <a href="https://www.auger.org/collaboration/funding-agencies">https://www.auger.org/collaboration/funding-agencies</a>	<b>KM3NET</b> <a href="https://www.km3net.org/about-km3net/collaboration/members/">https://www.km3net.org/about-km3net/collaboration/members/</a>
<b>BELLE</b> <a href="https://belle.kek.jp/bdocs/collaboration.html">https://belle.kek.jp/bdocs/collaboration.html</a>	<b>LifeWatch</b> <a href="https://www.lifewatch.eu/organisation-governance/">https://www.lifewatch.eu/organisation-governance/</a>
<b>BIOMED</b> <a href="https://vip.creatis.insa-lyon.fr/">https://vip.creatis.insa-lyon.fr/</a>	<b>LOFAR</b> <a href="https://www.astron.nl/telescopes/">https://www.astron.nl/telescopes/</a>
<b>CTA</b> <a href="https://www.cta-observatory.org/about/cta-consortium/">https://www.cta-observatory.org/about/cta-consortium/</a>	<b>LCHb</b> <a href="https://lhcb-public.web.cern.ch/en/collaboration/Collaboration-en.html">https://lhcb-public.web.cern.ch/en/collaboration/Collaboration-en.html</a>
<b>CLARIN</b> <a href="https://www.clarin.eu/content/participating-consortia">https://www.clarin.eu/content/participating-consortia</a>	<b>LSST</b> <a href="https://www.lsstcorporation.org/international-contributors">https://www.lsstcorporation.org/international-contributors</a>

#### CMS

<https://cms.cern/collaboration/cms-institutes>

#### NA62

<https://greybook.cern.ch/experiment/detail?id=NA62>

#### DUNE

<https://bnf-dune.fnal.gov/about/countries-and-institutions-participating-in-dune/>

#### OPENCOASTS

[http://opencoasts.inec.pt/index\\_en.php](http://opencoasts.inec.pt/index_en.php)

#### EISCAT\_3D

<https://eiscat.se/wp-content/uploads/2016/12/EISCAT-Organogram-202x.jpg>; <https://eiscat.se/scientist/document/information/>

#### PANOSC

<https://www.panosc.eu/partners/>

#### ELI-BEAM

<https://www.eli-beams.eu/about/cooperation/science/>

#### SeaDataNet

<https://www.seadatanet.org/About-us/SeaDataNet-AISBL/Members>

#### ELI-NP

[https://www.eli-np.ro/scientific\\_collaborations.php](https://www.eli-np.ro/scientific_collaborations.php)

#### SKA

<https://www.skatelescope.org/participating-countries/>

#### EMSO-ERIC

<http://emso.eu/organization/>

#### SNO+

<https://snoplus.phy.queensu.ca/collaboration.html>

#### FUSION

<https://documents.egi.eu/public/ShowDocument?docid=3484>

#### VIRGO

<https://apps.virgo-gw.eu/vmd/public/institutions>

#### HESS

<https://www.mpi-hd.mpg.de/hfm/HESS/pages/collaboration/>

#### WeNMR

<https://documents.egi.eu/document/2751>

#### Ice-Cube

<https://icecube.wisc.edu/collaboration/institutions/>

#### XENON

[https://science.purdue.edu/xenon1t/?page\\_id=27](https://science.purdue.edu/xenon1t/?page_id=27)



## EGI Membership Impact Report

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