EGI Council Participant: INFN

Participating in EGI Impact Report: Italy

2023

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Infographic

+4620 service users

In 2023, +4620 researchers from Italian institutions used the services provided by the EGI Federation

+920 publications

The research communities, projects and scientific collaborations from Italy supported by the EGI led to more than 920 peer-reviewed scientific publications
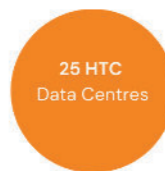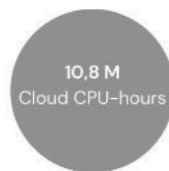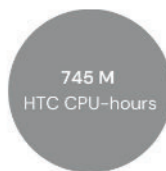
33 Supported communities

In 2023, the Italian infrastructure supported 33 research communities in the following disciplines: Agriculture, Climate Research, Health and Medicine, Linguistics, Physics

Projects

Italian partners participate in 31 collaboration projects + EGI-ACE, iMagine and interTwin

- 745 M HTC CPU-hours
- 10,8 M Cloud CPU-hours
- 25 HTC Data Centres
- EGI Federated Cloud member

Country overview

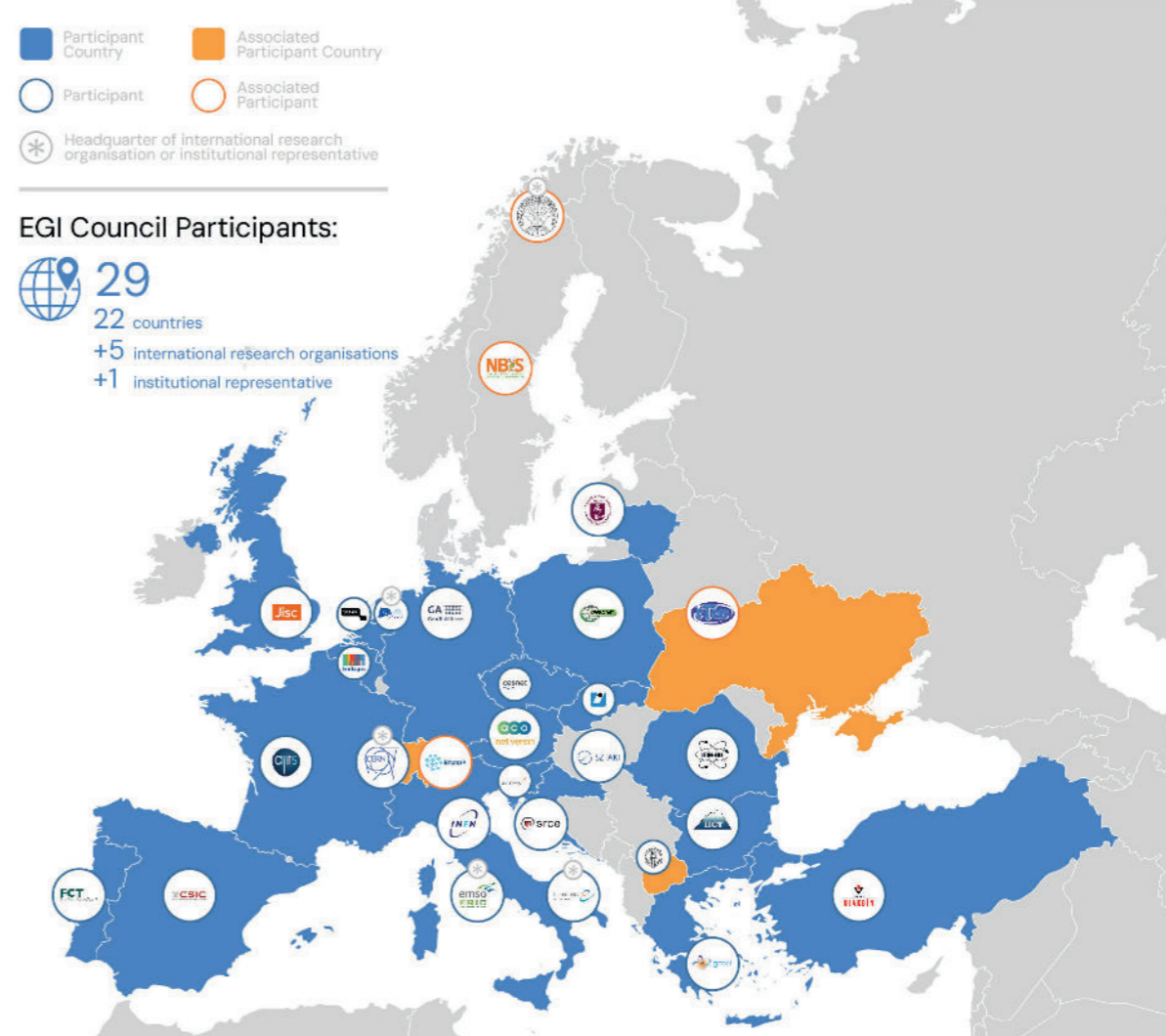|	
Number of supported publications	927
Number of total service users	4,625
Scientific Communities supported	33
Data Centres contributing to the Federation	26
Collaboration projects	31
Total HTC CPU hours delivered	745,579,361
Total HTC CPU hours delivered	10,845,014

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.

EGI Council Participants:

29
22 countries
+5 international research organisations
+1 institutional representative

Approved EGI Council map from 2023

About INFN

The National Institute for Nuclear Physics (INFN) is the Italian research agency dedicated to the study of the fundamental constituents of matter and the laws that govern them, under the supervision of the Ministry of University and Research (MUR).

It conducts theoretical and experimental research in the fields of subnuclear, nuclear and astroparticle physics. All of the INFN's research activities are undertaken within a framework of international competition, in close collaboration with Italian universities on the basis of solid academic partnerships spanning decades.

In the context of EGI, INFN collaborates with CNR, the National Research Council of Italy, under the premises of a bilateral collaboration agreement to support the EGI-ACE project (2021–2023).

Overall EGI impact

INFN coordinates the Italian participation to the EGI Federation. INFN promotes the building and operation of a multidisciplinary national Distributed Computing Infrastructure open to all sciences and to developing countries in Italy. This report provides an overview of the activities of INFN in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by INFN 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 Italian 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 4625 researchers from Italy in 2023. The estimated annual scientific output in 2023 produced by research communities, projects and scientific collaborations from Italy and supported by the EGI Federation is estimated to amount to over 960 peer reviewed scientific publications.

The EGI Federation is currently working with over 40 Research Infrastructures, 33 of which include Italian partners. These EGI-enabled research infrastructures, their Italian members and their 2023 scientific output (publications) are detailed in the following pages of the report.

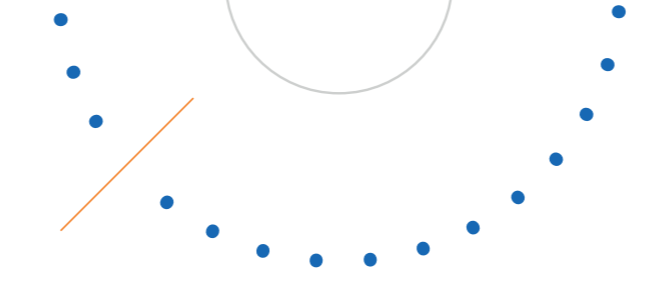| Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
AMS-02 (Particle Physics) • INFN various institutes • UNIBO • CNR • UNIMIB • UNIPI • UNITN • ASI • UNIROMA1	The AMS-02 experiment on the International Space Station has been using 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)	3
ALICE (High-Energy Physics) • INFN	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)	85
ATLAS (High-Energy Physics) • ATLAS (High-Energy Physics) • INFN various institutes • UNIBO • UNIGE • UNISalento • UNIMI • UNINA • UNIPV • UNICAL • UNIROMA1 • UNIROMA2 • UNIROMA3 • UNITN • UNIUD	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)	111

Italian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2023

AUGER (Astronomy)
- INFN various institutes
- INAF
- POLIMI
- UNISALENTO
- UNIVAQ
- UNICT
- UNIMI
- UNINA
- UNIROMA2
- UNITO

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)

8

BELLE (High-Energy Physics)
- INFN various institutes
- UNINA
- UNIROMA3
- UNIPD
- UNITS
- UNIPG
- UNITO
- UNIPI

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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Italian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2023

BIOMED (Life Sciences)
- BIOMED (Life Sciences)
- UNIVR
- INFN
- UNIFE
- Az. Ospedaliero–Universitaria di Modena
- Consorzio COMETA
- IRCCS-FBF
- UNIROMA1
- ICTP
- ASP 3 catania
- UNIBO
- IRCCS Ca' Granda
- Neuropsicologia Alto Adige
- POLIMI
- CNR

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:

- High–Throughput + Online Storage services
- 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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CLARIN (Linguistics)
- CNRS

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

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Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
CMS (High-Enery Physics) • INFN various institutes	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)	**117**
CTA (Astronomy) • IAPS • INAF various institutes • INFN various institutes • IUSS • UNIBA • UNIPD • UNISI • UNITO • UNIUD	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)	**0**

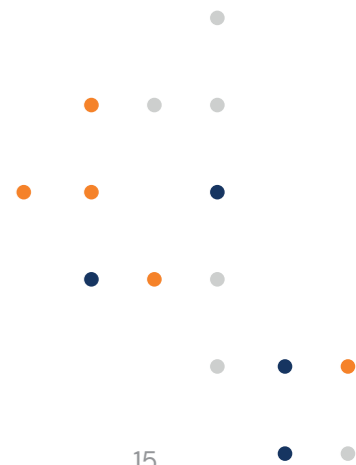| Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
COMPASS (Physical Sciences) • UNITO • UNITS	COMPASS has been supported since 2017 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered 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)	**0**
DUNE (Astroparticle Physics) • GSSI • INFN various institutes • UNICT • UNIGE • UNIPD • UNIPV • UNISALENTO • UNIFE • UNIPI	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)	**20**

Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
ELI-BEAM (Physical Sciences) • UNIME • INFN	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.	37
ELI-NP (Nuclear Physics) • INFN • Elettra-Sincrotrone Trieste	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	48
EMPHASIS (Agriculture) • CNR	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	0
EMSO (Oceanography) • INGV	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.	0

Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
FUSION (Fusion) • ENEA	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	0
ICARUS (Physical Sciences)	The collaboration with EGI started back in 2019. The services from the EGI federation that the experiment uses include: • EGI HTC services from 2 EGI federated sites from IT • 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)	0
IceCube (Neutrino Observatory) • UNIPD	The IceCube experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that IceCube uses include: • EGI HTC services from 8 sites of 4 EGI participant countries (Belgium, Denmark, Italia 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) • EGI is currently expanding its resource pledge to IceCube with an increase of GPU capacity.	20
ILC (High-Energy Physics) • INFN various institutes	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)	43

Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
INSTRUCT (Structural Biology) • Instruct Centre IT	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, Belgiany, 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.	**87**
JUNO (Neutrino Observatory) • UNICT • UNIFE • INFN various institutes • UNIMI • UNIMIB • UNIPD • UNIROMA3	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)	**43**
KM3NET (Neutrino Observatory) • INFN • UNIBA • UNIGE • UNINA • UNIPI • UNIROMA1 • UNIBO • UNICAMPANIA • UNISA • INGV	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)	**58**

Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
LifeWatch (Biodiversity and Ecosystem Research) • Accademia dei 40 • INFN • OGS • Anton Dohrn Zoological Station • Mediterranean Agronomic Institute of Bari, • as well as many universities, regional agencies and private bodies	The LifeWatch experiment has been using compute resources from EGI partners since 2018. The services from the EGI federation that LifeWatch uses include: • EGI Cloud services from 2 EGI federated sites from ES and PT • 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)	**0**
LHcB (High-Energy Physics) • UNIBA • UNIBO • UNICA • UNIFE • UNIFI • UNIGE • UNIMIB • UNIROMA2 • UNIMI • UNIPD • UNIPI • SNS • UNIROMA1 • INFN various institutes	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)	**44**

Italian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
LSST (Astronomy) • INAF	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)	11
MINKE (Oceanography) • OGS	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)	0
MOEDAL-MAPP (Physical Sciences) • UNIBO • INFN	MOEDAL-MAP has been supported since 2016 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)	0
NA62 (High-Energy Physics) • INFN various institutes	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)	5
PANOSC (Photon and Neutron) • CERIC-ERIC	PaNOSC 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 data centres from CZ and DE • EGI AAI Check-in • EGI Notebooks • EGI DataHub	5

Italian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2023

SeaDataNet (Oceanography)
- ENEA
- INGV
- ETT SpA (SCAI Group)
- OGS

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.

1

SKA (Radioastronomy)
- INAF

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, Italia, 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:

- Organise 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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Italian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2023

VIRGO (Astrophysics)
- Accademia Nazionale dei Lincei
- CNR
- UNIGE
- UNITO
- UNITS
- UNISANNIO
- UNIUD
- UNISA
- UNIPR
- EGO
- GSSI
- INAF various institutes
- INFN various institutes
- CREF
- UNIBAS
- SNS
- UNIMIB
- UNISS
- UNIURB
- UNICAM
- UNIFI
- UNINA
- UNIPD
- UNIPG
- UNIPI
- UNIROMA3
- UNIROMA2
- UNIROMA1
- UNISI
- UNITN

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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Italian research collaborations in EGI

EGI supported activities and services

WeNMR (Structural Biology)

- WeNMR (Structural Biology)
- UNIBO
- UNIPR
- UNINA
- IIT
- UNISI
- UNIPV
- ENEA
- BIOGEM
- EBRIS
- CNR BIOPHYSICS INSTITUTE
- UNIVR
- UNICA
- UNIFI
- UNIROMA2
- UNIBO
- UNIPD
- UNIVERSITÀ CAMPUS BIOMEDICO DI ROMA
- UNIPG
- SAN RAFFAELE HOSPITAL
- ISTITUTO NAZIONALE TUMORI
- UNISALENTO
- UNITN
- UNICT
- UNIROMA3
- UNICAL
- NIGUARDA HOSPITAL
- POLIMI
- CRO AVIANO
- UNIBA
- UNIMIB
- IRCCS SANTA LUCIA
- IRCCS ISTITUTO AUXOLOGICO ITALIANO
- UNISANNIO
- UNIVERSITÀ VITA-SALUTE SAN RAFFALE
- UNITUS
- UNIVPM

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, Italia, 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.

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Italian research collaborations in EGI

EGI supported activities and services

XENON (Dark Matter Physics)

- INFN various institutes

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, Italian providers including INFN–CLOUD–BARI, INFN–BARI, INFN–CATANIA, INFN–FERRARA, INFN–PISA, INFN–ROMA3, INFN–PADOVA–STACK and INFN–LNL–2 supported 13 Service Level Agreement for international scientific communities via EGI, delivering Cloud Computing, Online Storage, and HTC services.

Participated projects

The EGI Foundation coordinated one Horizon 2020 projects, 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 Italian 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 collaboration is provided in the next table.
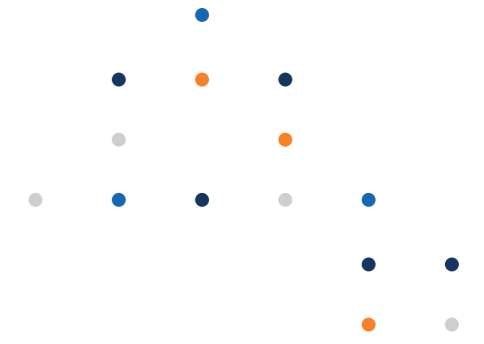
Project title	Scope of collaboration	Participating beneficiaries from the country
AI4EUROPE Supporting A 90	EGI is contributing to the architectural design and implementation of open distributed software to ensure that AI4Europe evolves as a distributed ecosystem. EGI is also providing its expertise 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.	• UNIBO
AI4PublicPolicy	EGI is involved in the activities around Cloud-based AI Tools for Citizen Centric & Autonomous Policy, in particular with the Dynamic provisioning of Cloud and HPC. Moreover, it leads the integration of Validated AI-based Applications and Tools, contributes to dissemination and communication, and leads the the business modelling and sustainability planning.	• GFT Italia Srl • SIA Spa • Comune Di Genova • EKSO Srl
ANERIS	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.	• EMSO ERIC
BD4NRG Big Data for Next Generation Energy	The EGI Foundation delivers a reference architecture for Smart Energy and extend COSMAG specification to enable B2B multi-party data exchange, while providing full interoperability of leading-edge big data technologies with smart grid standards and operational frameworks; evolve and upscale a number of TRL 5-6 technology enablers; delivers a TRL8 open modular big data analytic toolbox as front-end for one-stop-shop analytics services development by orchestrating legacy and/or third party assets (data, computing resources, models, algorithms); validates such framework through the delivery of predictive and prescriptive edge AI-based big data analytics on 13 large scale pilots, deployed by different energy stakeholders.	• Engineering Ingegneria Informatica Spa It • ENEL Green Power • ASM Terni • E-lex
eosc Blue-Cloud2026	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.	• CNR • TRUST-IT • NUBISWARE SRL • CMCC • CINECA • OGS • ETT SPA • EMSO-ERIC • INGV

Project title	Scope of collaboration	Participating beneficiaries from the country
CRAFT-OA eosc	EGI coordinates the task dedicated to the Single Sign-On access with the EGI Check-in service.	• UNITO
C-SCALE	EGI the project coordination and led the activity to setup the C-SCALE Compute Federation, leveraging on its exstensive experience on setup and managing large distributed infrastructures. EGI also took care of the interactions with other EOSC initiatives and projects and had a leading role on defining C-SCALE business and sustainability.	• INFN
d	EGI is involved in developing a detailed roadmap, analyzing state-of-the-art technology, and designing a modular architecture framework. Morever, It works to improve data monetization strategies for EU companies and define KPIs for fair dataset valuation. EGI will help develop business cases for data sharing platforms, explore non-monetary data value dimensions, and prepare pilots for framework deployment. Demonstration and validation tests will be conducted at pilot sites. Additionally, EGI contributes to disseminating results, managing innovation and sustainability, participating in standardization activities, and coordinating with the Data Spaces Support Centre.	• CINECA
DIGITBRAIN	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..	• CIAOTech Srl • TST Technology Transfer Systems Srl • Stam Srl • START 4.0 • Gigant Italia Srl • Fratelli Piacenza S.P.A. • Domina Srl • Strategiche Start 4.0

Project title	Scope of collaboration	Participating beneficiaries from the country
EOSC-Life	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.	• UNIMIB • UNITO • CIRMMP • IRCCS Ospedale Policlinico San Martino • CNR
EOSC Future	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.	• EPOS • INFN • SNS • TRUST-IT SRL • EMSO ERIC
EUCAIM	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.	• CNR • Gemelli University Hospital • Istituto Nazionale Tumori Regina Elena • IFOM • Maggioli • Neuromed • Policinico San Donato Research Hospital • UNIROMA1 • SYNLAB • UNIPI
EUH4D	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.	• CINECA • IDC
EUREKA3D	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.	• Photoconsortium • Museo della Carta Pescia
eosc EuroScienceGateway	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.	• UNIFI • CNR • INFN
graspos	EGI contributes to the definition of requirements, metrics, specifications and pilots for the assessment of thematic services and platforms	• CNR • UNIBO
GREAT Green Deal Data Space	EGI was involved in coordinating the Green Deal Data Space, establishing a stakeholder network, and managing dissemination and online presence. Also. EGI contributed to developing the Technical Architecture. Moreover, EGI coordinated efforts on Governance and Business Models, analyzing current governance schemes and proposing appropriate governance for the Green Deal Data Space. Additionally, EGI contributed to the implementation roadmap for the Green Deal Data Space.	• IDC • CNR • INGV • EPOS ERIC
HEALTHYCLOUD	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.	• CNR • Synlab Sdn Spa
lethe Digital Cognitive Biomarkers	EGI Foundation is leading the design of LETHE system architecture and building a data collection and big data framework, including set-up of the LETHE big data infrastructure, set-up the authentication scheme for the LETHE project and registration of the LETHE infrastructure and services in EOSC.	• UNIPG • i2grow Innovation To Grow Srl • Extra Red Srl
openEO PLATFORM	EGI contributes to the project with the AAI service and Marketplace integration. Moreover, it collaborates to the project's outreach activities.	• EURAC

Project title	Scope of collaboration	Participating beneficiaries from the country
Policy Cloud	PolicyCLOUD aims at delivering an integrated cloud-based environment for data-driven policy management. EGI leads the activities on Cloud Infrastructures Utilization & Data Governance, collaborates to the Use cases Adaptation, Integration & Experimentation and to the project's communication and dissemination activities.	• Maggioli Spa • Trust-It Srl • Ict Legal Consulting – Studio Legale Associato Balboni Bolognini & Partners
Pre-PAI	EGI contributes supporting HPC, Cloud and Edge, and to to the strategic engagement with the European AI Ecosystem and connected communities.	• UNIBO • Fondazione Bruno Kessler • Intellera Consulting SRL • Engineering
SoBIGDATA	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.	• CNR • UNIPI • IMT Lucca • SNS • UNIROMA1 • UNIVAQ • Societa Cooperativa Sociale Eliante Onlus • Carlo Ratti Associati S.R.L. • Nubisware Srl • Scuola Superiore Sant'Anna
STAIRWAI	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.	• UNIBO • INFN
TANGO	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.	• POSTE ITALIANE SPA • ABI

Project title	Scope of collaboration	Participating beneficiaries from the country
Triple	EGI is involved in the work ensuring the integration of the TRIPLE solution into the EOSC; also, it collaborates to the sustainability and innovation activities by setting up the processes to prepare maturity assessment and innovative agile management. Last but not least, it guides the implementation of the EGI AAI service in TRIPLE.	• Net7 Srl • CNR
EUCloudEdgeIoT.eu	Unlock the potential for accelerating the deployment of the Cloud-to-Edge-IoT (CEI) computing continuum in Europe by focusing on the demand-side drivers and challenges to identify technology-driven innovation and business opportunities driving demand value chains.	• IDC • TRUST-IT Services

Infrastructure contributions

The EGI Federation offers two complementary compute capabilities: the High-Throughput Compute (HTC) federation and the Cloud federation. 28 Italian data centres contribute to these federations:

HTC Federation:

- CIRMMP (Consorzio Interuniversitario Risonanze Magnetiche di Metalloproteine Paramagnetiche – CIRMMP)
- CNR-ILC-PISA (Institute of Computational Linguistics – CNR)
- INFN-BARI (INFN)
- INFN-CATANIA
- INFN-CNAF-LHCB
- INFN-COSENZA
- INFN-FERRARA
- INFN-FRASCATI
- INFN-GENOVA
- INFN-LECCE
- INFN-LNL-2
- INFN-MIB
- INFN-MILANO-ATLASC
- INFN-NAPOLI-ATLAS
- INFN-PADOVA
- INFN-PISA
- INFN-ROMA1
- INFN-ROMA1-CMS
- INFN-ROMA3
- INFN-T1
- INFN-TORINO
- INFN-TRIESTE
- RECAS-NAPOLI (University of Naples Federico II

and INFN)
- TRIGRID-INFN-CATANIA (INFN)
- UNINA-EGEE (University of Naples Federico II)

Cloud Federation:
- INFN-CLOUD-BARI (former RECAS-BARI),
- INFN-CLOUD-CNAF.

The data centres provided 129 service endpoints and delivered 745,579,361 CPUhours in total to EGI communities in 2023. The data centres responded to 282 support tickets through the EGI Helpdesk.

The most active international user groups of the Italian compute resources were:

- CMS 39.04%,
- ATLAS 21.47%,
- ALICE 17.61%,
- LHCB 16.19%,
- VIRGO 2.85%,
- BELLE 1.75%,

With the help of the EGI Security Vulnerability Group, the Italian 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)

AMS-02
https://ams02.space/publications

ILC
https://inspirehep.net/literature?sort=mostrecent&size=25&page=1&q=international%20Linear%20Collider%20&earliest_date=2021--2021

ALICE
https://alice-publications.web.cern.ch/publications

INSTRUCT
https://instruct-eric.eu/content/publications-list

ATLAS
https://cds.cern.ch/collection/ATLAS%20Papers?ln=en

JUNO
https://inspirehep.net/

AUGER
https://www.auger.org/science/publications/journal-articles

KM3NET
https://www.km3net.org/about-km3net/publications/pubblication/;
https://inspirehep.net/literature?q=collaboration:KM3NeT year:2021

BELLE
https://belle.kek.jp/belle/publications.html; https://inspirehep.net/literature?q=collaboration:belle year:2021

LifeWatch
https://www.lifewatch.eu/catalogue-of-virtual-labs/medobis/publications/

BIOMED
https://vip.creatis.insa-lyon.fr/documentation/

LOFAR
http://old.astron.nl/radio-observatory/lofar-science/
lofar-papers/lofar-papers; https://lofar-surveys.org/
publications.html, or https://ui.adsabs.harvard.edu/search/
q=full%3A(%22designed%20and%20constructed%20
by%20ASTRON%22)%20OR%20title%3A%22LOFAR%22%20
year%3A2021-2021%20property%3Arefereed%20
-bibstem%3A(%22AN%22%20OR%20%22MNRAS.
tmp%22)&sort=date%20desc%2C%20bibcode%20
desc&p_=0

CTA
https://www.cta-observatory.org/science/library/

LCHb
https://cds.cern.ch/collection/LHCb%20Papers?ln=en

CLARIN
https://beta.clarin.openaire.eu/search/advanced/research-out
comes?sortBy=resultdateofacceptance,descending&type=pu
blications&year=range2021:2021

LSST
https://ui.adsabs.harvard.edu/ with year:2021 author:("LSST*"
OR "Vera C. Rubin*") collection:astronomy property:refereed

CMS
http://cms-results.web.cern.ch/cms-results/public-results/
publications/CMS/index.html

NA62
https://cds.cern.ch/collection/NA62%20Papers?ln=en

DUNE
https://inspirehep.net/literature?q=collaboration:DUNE
year:2021

OPENCOASTS
http://opencoasts.lnec.pt/index_en.php

EISCAT_3D
https://eiscat.se/scientist/publications/

PANOSC
https://www.panosc.eu/publications/

ELI-BEAM
https://www.eli-beams.eu/publikace/

SeaDataNet
https://www.seadatanet.org/Publications/Scientific-
publications

ELI-NP
https://www.eli-np.ro/scientific_papers.php

SKA
https://ui.adsabs.harvard.edu/search/fq=%7B!type%3Daqp%20
v%3D%24fq_database%7D&fq_database=database%3A%20
astronomy&q=pubdate%3A%5B2021-01%20TO%202021-
12%5D%20title%3A(SKA)&sort=date%20desc%2C%20
bibcode%20desc&p_=0

EMSO-ERIC
from the community representative; SLA https://documents.
egi.eu/document/3539

SNO+
https://snoplus.phy.queensu.ca/results/collaboration-papers.
html

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

VIRGO
https://pnp.ligo.org/ppcomm/Papers.html

HESS
https://www.mpi-hd.mpg.de/hfm/HESS/pages/publications/

WeNMR
https://explore.openaire.eu/ advanced search
project outcomes. field to search "project" enter
project name; Citation of HADDOCK web server:
https://scholar.google.nl/scholar?hl=en&as_
sdt=2005&cites=10355645612647046441&scipsc=&as_
ylo=2021&as_yhi=2021; Citations of the
AMBER web portal publication: https://scholar.
google.com/scholar?as_ylo=2021&hl=en&as_
sdt=0,5&sciodt=0,5&cites=6696812766870837905&scipsc=;
Citations of the FANTEN web portal publication: https://
scholar.google.com/scholar?as_ylo=2021&hl=en&as_
sdt=0,5&sciodt=0,5&cites=10578718345045994565&scipsc=;
Citations of the DISVIS/POWERFIT web portals publication:
https://scholar.google.com/scholar?as_ylo=2021&hl=en&as_
sdt=2005&cites=648211450124447208&scipsc='; Citations of
the SpotON web portal: https://scholar.google.com/scholar?as_
ylo=2021&hl=en&as_

Ice-Cube
https://icecube.wisc.edu/science/publications/

XENON
https://inspirehep.net/literature?q=collaboration:XENON
year:2021

National institutional members of supported research communities (table 2)

AMS-02
https://ams02.space/collaboration/institute

ILC
https://linearcollider.org/team/

ALICE
https://alice-collaboration.web.cern.ch/General/Members/List_Institutes.html

INSTRUCT
https://instruct-eric.eu/countries

ATLAS
https://atlas.cern/discover/collaboration

JUNO
https://juno.ihep.ac.cn/collaboration.php

AUGER
https://www.auger.org/collaboration/institutions, https://www.auger.org/collaboration/funding-agencies

KM3NET
https://www.km3net.org/about-km3net/collaboration/members/

BELLE
https://belle.kek.jp/bdocs/collaboration.html

LifeWatch
https://www.lifewatch.eu/organisation-governance/

BIOMED
https://vip.creatis.insa-lyon.fr/

LOFAR
https://www.astron.nl/telescopes/

CTA
https://www.cta-observatory.org/about/cta-consortium/

LCHb
https://lhcb-public.web.cern.ch/en/collaboration/Collaboration-en.html

CLARIN
https://www.clarin.eu/content/participating-consortia

LSST
https://www.lsstcorporation.org/international-contributors

CMS
https://cms.cern/collaboration/cms-institutes

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

DUNE
https://lbnf-dune.fnal.gov/about/countries-and-institutions-participating-in-dune/

OPENCOASTS
http://opencoasts.lnec.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

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

EGI Membership Impact Report

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