EGI Council Participant: Gauß-Allianz

Participating in EGI Impact Report: Germany

2024

egi.eu

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Infographic

+8,870 service users

In 2024, +8,870 researchers from German institutions used the services provided by the EGI Federation

+1,740 publications

The research communities, projects and scientific collaborations from Germany supported by the EGI led to more than 1,740 peer-reviewed scientific publications

32 Supported communities

In 2024, the German infrastructure supported 32 research communities in the following disciplines: Agriculture, Climate Research, Health and Medicine, Linguistics, Physics

Projects

German partners participate in 26 collaboration projects.

Compute Delivery

In 2024, the infrastructure providers from Germany federated in EGI delivered 877,818,837 HTC CPU Hours and 349,708 Cloud CPU Hours.

Country overview

Number of supported publications	1,747
Number of total service users	8,873
Scientific Communities supported	32
Data Centres contributing to the Federation	18
Collaboration projects	26
Total HTC CPU hours delivered	877,818,837
Total Cloud CPU hours delivered	349,708

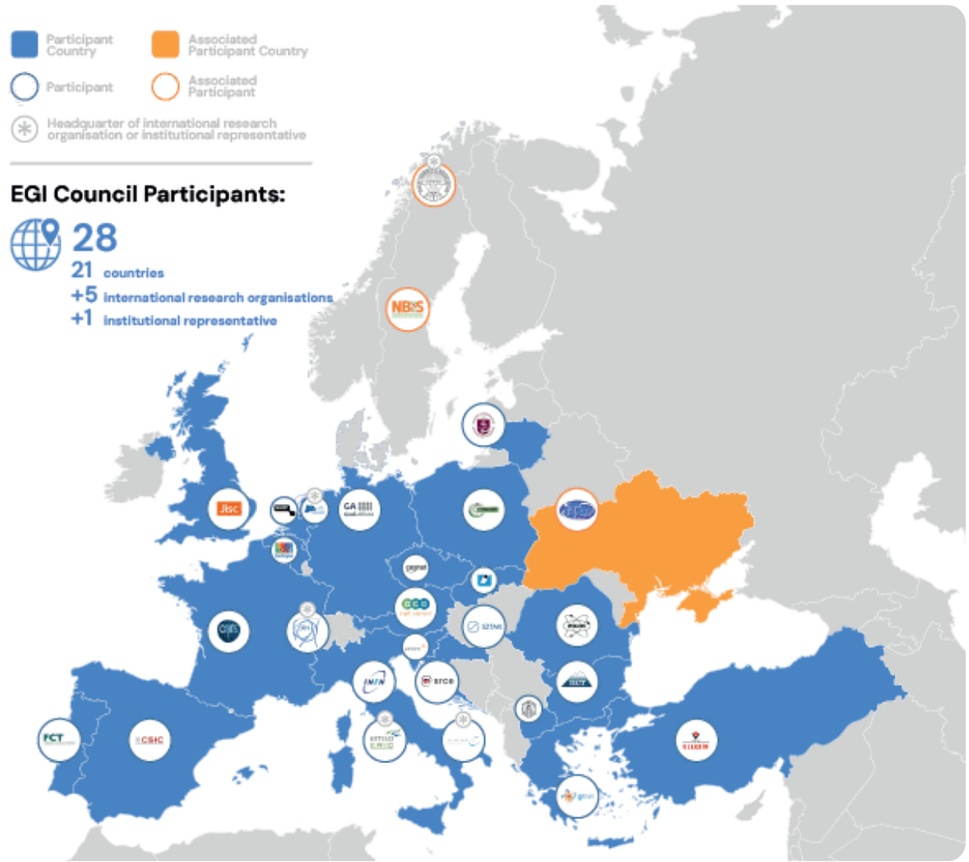
About EGI

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 2024.



Approved EGI Council map from 2024

About Gauß-Allianz

The Gauß-Allianz was funded to promote research and development in the field of HPC and to coordinate the HPC related activities in Germany. A further important goal is to increase the visibility on an international level by bundling the expertise of the participating centres. Gauß-Allianz coordinates the NGI-DE, the national grid initiative for Germany, whose goal is to provide reliable and secure e-infrastructures for Germany.

Overall EGI impact

Gauß-Allianz coordinates the German participation to the EGI Federation, representing the NGI-DE (National grid initiative for Germany). Gauß-Allianz promotes research and development in the field of HPC, and coordinates the HPC related activities, in Germany.

This report provides an overview of the activities of NGI-DE in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by Gauß-Allianz to the EGI Foundation in 2024 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 2024, the EGI Federation served around 116,000 users (+23%). EGI users consumed 7,4 Billion HTC CPU hours (+5.7%), 62,7 Million Cloud CPU hours (-23,5%), ran over 402 M computational jobs (+8%) and published over 2,560 open access publications.

As of the previous year, the research community with the largest number of users is Medical and Health Sciences, while the community with most extensive HTC CPU/h consumption is CMS.

From the scientific communities engaged in 2024, the one with most extensive Cloud CPU/h consumption is WeNMR.

Moreover, EGI engaged with a total of 249 scientific communities; 11 SMEs and business pilots, and 2 additional Research Infrastructure included in the ESFRI Roadmap, raising the total of number of ESFRI partners/users of EGI to 25.

EGI's contribution to German 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 2024, our federation was used by over 260 scientific communities, and has been accessed by around 116.000 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.

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 8,873 researchers from Germany in 2024. The estimated annual scientific output in 2024 produced by research communities, projects and scientific collaborations from Germany and supported by the EGI Federation is estimated to amount to over 1,740 peer reviewed scientific publications.

The EGI Federation is currently working with over 40 Research Infrastructures, 33 of which include German partners. These EGI-enabled research infrastructures, their German members and their 2024 scientific output (publications) are detailed in the following pages of the report

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
AMS-02 (Particle Physics) • I. Physics Institute and JARA-FAME, RWTH Aachen University • KIT, Karlsruhe Institute of Technology • University of Kiel	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)	1
ALICE (High-Energy Physics) • Bonn, Helmholz-Institut für Strahlen und Kernphysik, Rheinische Friedrich-Wilhelms-Universität, Bonnn, • Darmstart, Institut für Kernphysik, Technische Universität Darmstadt • Darmstadt, Research Division and ExtreMe Matter Institut EMMI, GSI Helmholtzzentrum für Schwerionenforschung • Frankfurt, Frankfurt Institute for Advanced Studies, Johann-Wolfgang-Goethe Universität, • Frankfurt, Institut für Informatik, Johann-Wolfgang-Goethe Universität • Frankfurt, Institut für Kernphysik, Johann-Wolfgang-Goethe Universität • Heidelberg, Physikalisches Institut, Ruprecht-Karls-Universität, • Köln, Fachhochschule Köln • München, Physik Department, Technische Universität München • Münster, Institut für Kernphysik, Westfälische Wilhelms-Universität, • Tübingen, Eberhard-Karls-Universität Tübingen • Worms, Zentrum für Technologietransfer und Telekommunikation (ZTT), Fachhochschule Worms	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)	47

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
ATLAS (High-Energy Physics) • Institut für Physik, Humboldt Universität zu Berlin, Berlin • Physikalisches Institut, Universität Bonn, Bonn • Lehrstuhl für Experimentelle Physik IV, Technische Universität Dortmund, Dortmund • Institut für Kernund Teilchenphysik, Technische Universität Dresden, Dresden • Physikalisches Institut, Albert-Ludwigs-Universität Freiburg, Freiburg • II. Physikalisches Institut, Justus-Liebig-Universität Giessen, Giessen • II. Physikalisches Institut, Georg-August-Universität Göttingen, Göttingen • Deutsches Elektronen-Synchrotron DESY, Hamburg and Zeuthen • Kirchhoff-Institut für Physik, Ruprecht-Karls-Universität Heidelberg, Heidelberg • Physikalisches Institut, Ruprecht-Karls-Universität Heidelberg, Heidelberg • Institut für Physik, Universität Mainz, Mainz • Fakultät für Physik, Ludwig-Maximilians-Universität München, München • Max-Planck-Institut für Physik (Werner-Heisenberg-Institut), München • Department Physik, Universität Siegen, Siegen • Fakultät für Mathematik und Naturwissenschaften, Fachgruppe Physik, Bergische Universität Wuppertal, Wuppertal • Fakultät für Physik und Astronomie, Julius-Maximilians-Universität Würzburg, Würzburg	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)	126

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
AUGER (Astronomy) • Bergische Universität Wuppertal, Fachbereich C Physik • Karlsruhe Institute of Technology, Institut für Experimentelle Teilchenphysik (ETP) • Karlsruhe Institute of Technology, Institut für Kernphysik (IKP) • Karlsruhe Institute of Technology, Institut für Prozessdatenverarbeitung und Elektronik (IPE) • RWTH Aachen University, III. Physikalisches Institut A • Universität Hamburg, II. Institut für Theoretische Physik • Universität Siegen, Fachbereich 7 Physik Experimentelle Teilchenphysik	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 benefi ts 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)	12
BELLE (High-Energy Physics) • DESY	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)	9
CLARIN (Linguistics) • CLARIN-D Uni of Tuebingen	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	13

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
CMS (High-Enery Physics) • University of Hamburg • Deutsches Elektronen-Synchrotron • RWTH Aachen University, III. Physikalisches Institut B • Institut für Experimentelle Teilchenphysik	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)	109
CTA (Astronomy) • Department of Physics, Humboldt University Berlin • Department of Physics, TU Dortmund University • Deutsches Elektronen-Synchrotron • Institut für Astronomie und Astrophysik, Universität Tübingen • Institut für Theoretische Physik, Ruhr-Universität Bochum • Institute for Theoretical Physics and Astrophysics, Universität Würzburg • Institut für Physik & Astronomie, Universität Potsdam • Landessternwarte, Universität Heidelberg • Max-Planck-Institut für Kernphysik • Max-Planck-Institut für Physik • Universität Erlangen-Nürnberg, Physikalisches Institut • Universität Hamburg, Institut für Experimentalphysik	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

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
Comet.j-parc.jp (Physical Sciences) • Technical University Dresden, Dresden, Germany	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)	4
COMPASS (Physical Sciences) • Institut für Experimentalphysik I, Bochum • University of Bonn, • University Freiburg • Universitat Manz • Technical university of Munich	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)	2

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
ELI-BEAM (Physical Sciences) • Helmholtz-Zentrum Dresden-Rossendorf e. V. (HZDR) • Institut für Optik und Quantenelektronik (IOQ) Jena • University Hamburg – Germany; • DESY/CFEL • Max Planck Institut für Quantenoptik (MPQ)	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.	3
ELI-NP (Nuclear Physics) • Research Cluster "Matter and Radiation Science" Technische Universitat Darmstadt • Institute of Nuclear Physics, University of Cologne • Friedrich Schiller University, Jena • "II. Physikalisches Institut" of Justus-Liebig University, Giessen • GSI Helmholtzzentrum fur Schwerionenforschung GmbH, Darmstadt • Helmholtz-Zentrum Dresden-Rossendorf • Technische Universitat Munchen • Technische Universitat Darmstadt	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	19
EMPHASIS (Agriculture) • FZJ (Forschungszentrum Jülich) • Plant Sciences (IBG-2), • IPK (Leibniz Institute of Plant Genetics and Crop Plant Research), • HMGU (Helmholtzzentrum München, German Research Center for Environmental Health)	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
FUSION (Fusion) • Forschungszentrum Karlsruhe (FZK) • Max Plank Institute for Plasma Physics (IPP)	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

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
HESS (Astroparticle Physics) • Max-Planck-Institut für Kernphysik, Heidelberg • Universität Hamburg, Institut für Experimentalphysik, Hamburg • Institut für Physik, Humboldt-Universität zu Berlin, Berlin • ECAP, Universität Erlangen-Nürnberg, Erlangen • DESY, Zeuthen • Institut für Physik und Astronomie, Universität Potsdam, Potsdam • Landessternwarte, Universität Heidelberg, Heidelberg • Institut für Astronomie und Astrophysik, Universität Tübingen, Tübingen	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)	6
IceCube (Neutrino Observatory) • Deutsches Elektronen-Synchrotron, Zeuthen • Friedrich Alexander Universität Erlangen-Nürnberg, Erlangen • Humboldt Universität zu Berlin, Berlin • Karlsruhe Institute of Technology, Karlsruhe • Ruhr-Universität Bochum, Bochum • RWTH Aachen, Aachen • Technische Universität Dortmund, Dortmund • Technische Universität München, Munich • Universität Münster, Münster • Universität Mainz, Mainz • Universität Wuppertal, Wuppertal	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, Germany 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.	22
ILC (High-Energy Physics) • DESY • Univ. of Hamburg • MPP – MPG • + 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)	75

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
JUNO (Neutrino Observatory) • Eberhard Karls Universität Tübingen, Physikalisches Institut, Tübingen • Nuclear Physics Institute IKP-2 Forschungzentrum Jülich, Jülich • Forschungszentrum Jülich GmbH, Central Institute of Engineering, Electronics and Analytics Electronic Systems(ZEA-2), Jülich • Institute of Experimental Physics, University of Hamburg, Hamburg • Institute of Physics and EC PRISMA, Johannes-Gutenberg University Mainz, Mainz • Physikalisches Institut B, RWTH Aachen University, Aachen • Technical University of Munich, Garching	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)	64
KM3NET (Neutrino Observatory) • Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen Centre for Astroparticle Physics (ECAP) • University Würzburg • University of Erlangen, Remeis Sternwarte • University of Münster, Institute of Nuclear Physics	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)	25

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
LHcB (High-Energy Physics) • Aachen, I. Physikalisches Institute, RWTH • Dortmund Univ. • Heidelberg, Max-Planck-Institut für Kernphysik • Heidelberg, Physics Inst.	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)	49
LOFAR (Astronomy) • University of Bielefeld • University of Bochum • University of Bonn • University of Cologne • University of Dortmund • Max-Planck-Institut for Radioastronomie Bonn • Jacobs University Bremen • Max-Planck-Institut for Astrophysic Garching • Sternwarte Hamburg • Forschungszentrum Jülich • Astrophysikalisches Institut Potsdam • The Cluster of Excellence for Fundamental Physics • Thüringer Landessternwarte Tautenburg • Faculty of Physics and Astronomy, University of Würzburg • Lehrstuhl für Experimentelle Physik Vb, Dortmund Technical University • Physikalisches Institute, University of Köln	LOFAR has been supported by EGI partners in the EOSChub project in the setup and validation of a data access and transformation workfl ow on High Throughput Compute (HTC) resources. Since 2021 LOFAR (represented by ASTRON) participates in the EGI-ACE Horizon 2020 project where SURF (EGI member from NL) supports the setup, operation and promotion of the LOFAR Data Space, an online service that produces and make 'LOFAR science ready data' available in EOSC for broad uptake. The setup will rely on EGI HTC, Check-in, Helpdesk and consultancy/ technical support services.	101

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
LSST (Astronomy) • Astronomisches Rechen-Institut, Zentrum für Astronomie de Universität Heidelberg (ARI/ZAH) • Deutsches Elektronen-Synchrotron (DESY) • Leibniz-Institut für Astrophysik Potsdam (AIP) • Ludwig-Maximilians-Universität (LMU) • Max Planck Institute for Astrophysics (MPA) • Max Planck Institute for Astronomy (MPIA) • Max Planck Institute for Extraterrestrial Physics (MPE)	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
NA62 (High-Energy Physics) • Johannes Gutenberg • Universitaet Mainz	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) • European XFEL	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	0

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
SeaDataNet • (Oceanography) • Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research	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.	0
SKA (Radioastronomy) • As for LOFAR, German effort in SKA is coordinated by GLOW and is formed by German university departments and research institutes.	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, Germany, 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.	91
SNO+ (High-Energy Physics) • TU Dresden, Institut für Kernund Teilchenphysik	The Snoplus experiment has been using compute resources from EGI partners since 2011. The services from the EGI federation that the Snoplus experiment uses include: • EGI HTC services from 3 EGI federated sites from DE, ES 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)	3

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
VIRGO (Astrophysics) • Institut für Kernphysik, Theoriezentrum • Max Planck Institute for Gravitationalphysik (Albert Einstein Institute) • Theoretisch-Physikalisches Institut, Friedrich-Schiller-Universität Jena	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.	5
WeNMR (Structural Biology) • TU BERLIN • MDC BERLIN • FRAUNHOFER IZI-BB • UNIVERSITY OF FREIBURG BIO • HAMBURG ADVANCED RESEARCH CENTRE FOR BIOORGANIC CHEMISTRY • EMBL • UNI MÜNSTER • INSTITUT FÜR BIOLOGIE UND BIOTECHNOLOGIE DER PFLANZEN • MARTIN LUTHER UNIVERSITY • KIT • INSTITUTE OF STRUCTURAL BIOLOGY, HELMHOLTZ CENTER MUNICH • HUMBOLDT UNIVERSITY OF BERLIN • UNIVERSITY OF BONN • GOETHE UNIVERSITY FRANKFURT • UNIVERSITY OF WUPPERTAL • UNIVERSITY OF MARBURG • BMLS • and many others	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, Germany, 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.	939

German research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
XENON (Dark Matter Physics) • University of Freiburg • Johannes Gutenberg University, Mainz • Max-Planck-Institut für Kernphysik, Heidelberg • University of Münster • Karlsruhe Institute of Technology	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)	11

Service Level Agreements

During 2024, GSI-LCG2 supported 1 Service Level Agreements for international scientific communities via EGI, delivering Authentication and Authorisation, Cloud Computing and Online Storage services.

Community Engagement

During 2024, 30 participants from Germany joined the EGI2024 conference and delivered 10 talks in it. Moreover, one speaker from a German institution delivered the webinar Harnessing Advanced Research Infrastructures for Earth and Environmental Data Management and Analysis: A MATLAB Perspective (22/05/2024)

Participated projects

The EGI Foundation leads five Horizon Europe Projects, three of which started in 2024:

- iMagine (September 2022-December 2025)
- interTwin (September 2022-August 2025)
- ENVRI-Hub NEXT (February 2024-January 2027)
- EOSC Beyond (April 2024-March 2027)
- SPECTRUM (January 2024-June 2026)

Furthermore, the EGI Federation was involved in 3 additional projects, increasing the innovation potential of its participants.

The EGI Federation participates in Horizon 2020 and Horizon Europe projects together with Austrian 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
AARC	EGI leads the activities on Communication Dissemination and Exploitation Management and significantly contributes to the technical guidance and architecture definition, trust policy harmonisation and interoperability, validation activities, and to the preparation of the Compendium and recommendations.	• Forschungszentrum Jülich GmbH Karlsruher Institut für Technologie GWDG DAASI International GmbH
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.	• EMBL • ALFRED-WEGENER-INSTITUT • HELMHOLTZ-ZENTRUM FUR POLAR- UND MEERESFORSCHUNG
EOSC Future	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.	• EMBL • FRIEDRICH-ALEXANDER-UNIVERSITAET ERLANGEN-NUERNBERG • GEORG-AUGUST-UNIVERSITAT GOTTINGEN STIFTUNG OFFENTLICHEN RECHTS • KARLSRUHER INSTITUT FUER TECHNOLOGIE • DEUTSCHES ELEKTRONEN-SYNCHROTRON DESY • EU-OPENSCREEN ERIC
SoBigData Research Infrastructure	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	• Fraunhofer IAIS and IGD – Fraunhofer Gesellschaft Zur Foerderung Der Angewandten Forschung E.V. • Gottfried Wilhelm Leibniz Universität Hannover
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.	• Fraunhofer IAIS and IGD – Fraunhofer Gesellschaft Zur Foerderung Der Angewandten Forschung E.V. • Gottfried Wilhelm Leibniz Universität Hannover

Project title	Scope of collaboration	Participating beneficiaries from the country
EUHUB4D	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.	• KIT • IDSA
PITHIA-NRF	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.	• Deutsches Zentrum Fuer Luft - Und Raumfahrt Ev • Helmholtz Zentrum Potsdam • Deutschesgeoforschungszentrum Gfz
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.	• Kaasa Solution Gmbh
LABPLAS	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.	• Bundesanstalt Fuer Gewaesserkunde • Helmholtz-zentrum Fur Ozeanforschung Kiel (Geomar) • Leibniz-institut Fur Ostseeforschung Warnemunde • BASF Se
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.	• Rwth Aachen University • IDSA International Data Space • FIWARE Foundation

Project title	Scope of collaboration	Participating beneficiaries from the country
AI4EUROPE Supporting AIOD 2022-2025	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.	• DEUTSCHES FORSCHUNGSZENTRUM FUR KUNSTLICHE INTELLIGENZ GMBH • FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV
DATA SPACES SUPPORT CENTRE	EGI, as a very active player in the Data Space landscape in Europe, joined the project as Associated and collaboration Partner and participates in the Strategic Stakeholder Group (SSG) that will act as a think-and-do-tank to support the project in delivering to the policy objectives.	• FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV • FIWARE IDSA • ACATECH
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.	• ALBERT-LUDWIGS-UNIVERSITAET FREIBURG
CRAFT-CA | eosc	EGI coordinates the task dedicated to the Single Sign-On access with the EGI Check-in service.	• GEORG-AUGUST-UNIVERSITAT GOTTINGEN STIFTUNG OFFENTLICHEN RECHTS • MAX WEBER STIFTUNG DEUTSCHE GEISTESWISSENSCHAFTLICHE INSTITUTE IM AUSLAND • TECHNISCHE INFORMATIONSBIBLIOTHEK (TIB) • FREIE UND HANSESTADT HAMBURG
TANGO	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.	• Fraunhofer • IDSA • ECO VERBAND DER INTERNETWIRTSCHAFTEV • VISARIGHT GmbH

Project title	Scope of collaboration	Participating beneficiaries from the country
PHENET	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.	• FORSCHUNGSZENTRUM JULICH GMBH • RHEINISCHE FRIEDRICH-WILHELMS-UNIVERSITAT BONN • HELMHOLTZ-ZENTRUM FUR UMWELTFORSCHUNG GMBH - UFZ
EUCAIM CANCER IMAGE EUROPE	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.	• Charité • German Electron Synchrotron DESY • German Cancer Research Center • Technical University of Munich • University Hospital Aachen • ELIXIR
GreenDIGIT	Within the project, EGI will conduct an environmental impact landscape assessment within the EGI federation and in partner ESFRIs to identify best practices and opportunities related to environmental sustainability. The project will develop an environmental metrics publication system for digital service providers and energy-aware brokering logics for scientific workflows running on EGI HTC, cloud, container and AI services. EGI will develop an environmental impact self-assessment questionnaire for Research Infrastructures. Finally, EGI will assist with project communications and will provide consultancy and training for service providers within and beyond EGI on methods and approaches to lower their environmental impact.	• Technische Universität München
IRISCC	EGI plays a key role in IRISCC by leading communication, dissemination, engagement, and exploitation efforts (WP1), including stakeholder mapping and promotion of the service catalogue. In WP3, EGI supports knowledge exchange and user training by developing climate risk training modules and providing access to its training and computing infrastructure.. For WP6, EGI helps assess integrated knowledge services by aligning access policies, analysing AAI services, and contributing to FAIR and interoperability frameworks.	• Karlsruher Institut für Technologie • Forschungszentrum Jülich GmbH • Helmholtz-Zentrum für Umweltforschung – UFZ • Deutsche Klimarechenzentrum DKRZ • Senckenberg Gesellschaft für Naturforschung • GESIS - Leibniz-Institut für Sozialwissenschaften

Project title	Scope of collaboration	Participating beneficiaries from the country
	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.	• Fraunhofer-Gesellschaft • FIR (Verein) • INTERNATIONAL DATA SPACES e.V. • ECLIPSE Foundation Europe GmbH • DIN - Deutsche Institut für Normung e.V.
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.	• VDI/VDE INNOVATION + TECHNIK GMBH

Infrastructure contributions

The EGI Federation offers two complementary compute capabilities: the High-Throughput Compute (HTC) federation and the Cloud federation. 18 German data centres contribute to these federations:

HTC Federation:

- DESY-HH (Deutsches Elektronen-Synchrotron)
- DESY-ZN (Deutsches Elektronen-Synchrotron, Standort Zeuthen)
- GSI-LCG2 (GSI Helmholtzgesellschaft fur Schwerionenforschung GmbH, Darmstadt, Germany)
- FZJ (Forschungszentrum Juelich GmbH)
- FZK-LCG2 (KIT, Karlsruhe, Germany)
- GoeGrid (University Goettingen)
- LRZ-LMU (LMU LCG Tier-2)
- mainz (German HEP ATLAS Tier3, University of Mainz, Germany)
- MPPMU (Rechenzentrum der Max-Planck-Gesellschaft am Max-Planck-Institut fur Plasmaphysik)
- RWTH-Aachen (RWTH Aachen University)
- UNI-BONN (Rheinische Friedrich-Wilhelms-Universitaet Bonn)
- UNI-FREIBURG (Department of Physics and Computing Center of University of Freiburg)
- UNI-SIEGEN-HEP (Experimentelle Teilchenphysik; Department Physik; Naturwissenschaftlich-Technische Fakultaet; Universitaet Siegen)
- wuppertalprod (Bergische Universitaet Wuppertal Fachbereich C - Physik)

Cloud Federation:

- DESY-CC (Deutsches Elektronen-Synchrotron),
- GSI-LCG2 (GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt, Germany),
- GoeGrid (University Göttingen),
- SCAI (SCAI - Fraunhofer Institute of Algorithms and Scientific Computing)

The data centres provided 18 service endpoints and delivered 877,818,837 CPUhours and 349,708Cloud CPUHours to EGI communities in 2024. The data centres responded to 230 support tickets through the EGI Helpdesk. The most active international user groups of the German compute resources were:

- ATLAS 50.83%;
- CMS 22.08%;
- ALICE 14.24%;
- LHcB 9.64%;
- BELLE 2.68%;

With the help of the EGI Security Vulnerability Group, the German sites avoided 50 critical vulnerabilities in foundational software systems during 2024.

Methodology

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

Users

EGI uses the following methodology to capture the number of EGI users who rely on EGI services

- EGI serves users in the form of 'communities', called 'Virtual Organisations' (VO in short). A VO's members can range from one to tens of thousands. Members of a VO benefit from and use EGI services in different ways (e.g., by using Services for Federation or Services for Research).
- EGI establishes knowledge about its VOs as part of the user community support lifecycle; therefore, baseline information about VOs is collected through the Customer Relationship Management process (CRM).

At the end of 2024, there were 135 VOs in EGI.

EGI Virtual Organisations (VOs) can rely on different technical and non-technical mechanisms to manage their own members. Depending on their choice, the EGI Federation coordinator (EGI Foundation) has to follow different, corresponding approaches to know the number of members in a given VO, and to obtain additional information about these members (e.g. their 'country'). The EGI Foundation uses the following mechanisms to obtain information about the VO users:

- Obtain user number statistics from the EGI Operations Portal for VOs, where the members register personally in a 'VO membership management' system that is either operated by EGI or can be accessed by EGI.
- Obtain user number statistics from Community VRE REST APIs for VOs that operate Virtual Research Environments (VREs) on top of EGI resources. Those VREs implement a specific API to report users (e.g., WeNMR, Virtual Imaging Platform (VIP), NBIS).
- Obtain user number statistics from interviews with VO coordinators for VOs coordinated by one person.

Publications

Publications are collected from each community's public repository, if existing. Additional details are checked with the VO coordinators during the interviews to complement this information. EGI also consults OpenAIRE services to countercheck the data. You can check the list of repositories for each VO here (requires login): https://operations-portal.egi.eu/vo/#collapseVoListOther.

Institutional members supporting research communities

EGI relies on the information on each community's website to list institutions supporting research communities at the national level. Additionally, EGI appreciates the feedback from its national representatives to refine and improve those lists.

EGI Membership Impact Report

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