



EGI Council Participant: EISCAT

# Participating in EGI Impact Report: EISCAT

# 2023

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

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# Infographic

# About EGI



## 43 publications

The research communities, projects and scientific collaborations from EISCAT supported by the EGI led to 43 peer-reviewed scientific publications

## 4 services

In 2023, EISCAT used 4 services from EGI, provided by Cesnet, CNRS, GRNET and TUBITAK. These services are: EGI Workload Manager; EGI Cloud Compute; EGI Online Storage; EGI Check-in.

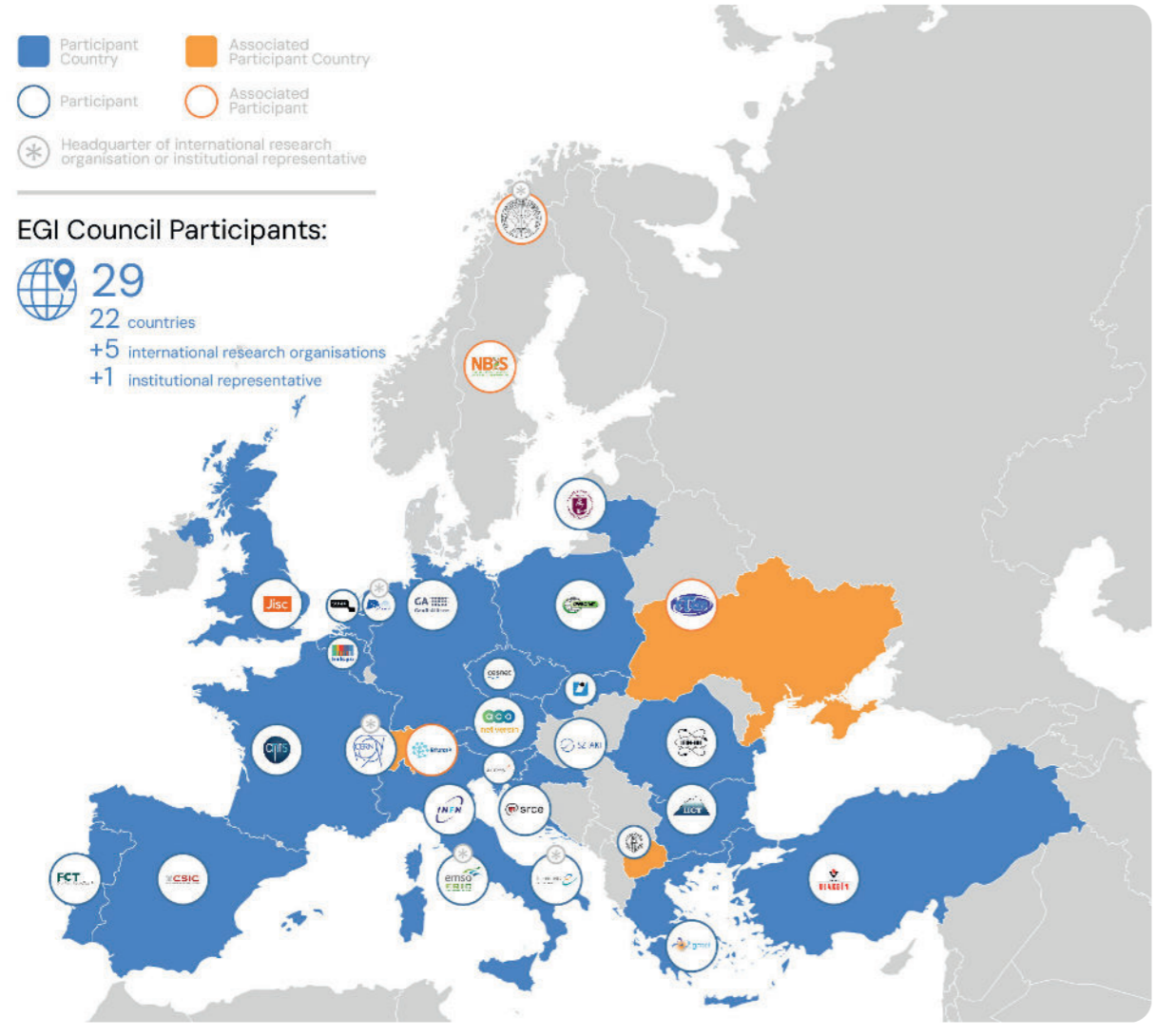
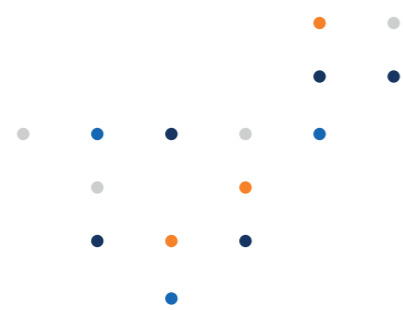


EGI is the federation of computing and storage resource providers united by a mission of delivering advanced computing and data analytics services for research and innovation.

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

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

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



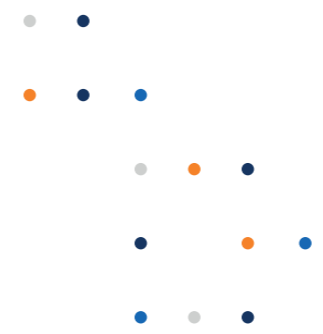
Approved EGI Council map from 2023



# About EISCAT

EISCAT Scientific Association is a non-profit scientific organisation that operate four radar antenna sites to carry out research mainly on the ionosphere and the upper atmosphere of the Earth.

The EISCAT radars are all located above the Arctic Circle and all sites work together, giving scientists an unique research opportunity. The radars have been used for different types of studies and different phenomena, for example Space Weather, Space Debris and the Aurora.





# Overall EGI impact

EISCAT contributes to the Federation's mission to deliver open solutions for advanced computing in research and innovation, coordinating and provisioning an international federated infrastructure that pools together service providers from both the public and private sector in Europe to develop, integrate and deliver digital services for compute and data-intensive research and innovation. In particular EISCAT contributes to facilitating access to general & specialised ICT resources at pan-European scale and to making expert support teams across Europe accessible. The annual membership fee contributed by EISCAT to the EGI Foundation in 2023 was 5,000 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's contribution to EISCAT 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, EISCAT services have been accessed by around 160 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 estimated annual scientific output in 2023 produced by research communities, projects and scientific collaborations supported by the EGI Federation is of 43 peer reviewed scientific publications.



## EISCAT research collaborations in EGI

### EISCAT (Incoherent Scatter Radar)

- National Instruments Belgium Nv
- Rutherford Appleton Laboratory,
- British Antarctic Survey

## EGI supported activities and services

EISCAT\_3D has been supported through competence centre activities in the EGI-Engage and EOSC-hub projects. Since 2021 the EISCAT Association is member of the EGI Council. Since 2018 the EISCAT\_3D experiment is using the following services from EGI:

- EGI Workload Manager
- EGI High Throughput Compute
- Technical support
- Software integration and piloting

From 2021 the EISCAT Association is working with EGI in the EGI-ACE Horizon 2020 project as an early adopter of the EOSC Compute Platform.

## Number of scientific papers published in 2023

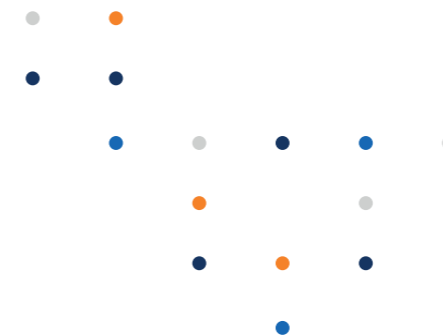
43

# Services from EGI and Providers

EGI and EISCAT stipulated an SLA (Service Level Agreement) in 2021. Since then EISCAT benefits from the following services:

- EGI Workload Manager
- EGI Cloud Compute
- EGI Online Storage
- EGI Check-in and Perun

During 2023 the EISCAT community consumed 176,364 cloud compute CPU-hours through EGI: 106,506 from the CSTCloud site (China), and 69,859 from TUBITAK-ULAKBIM site (Turkey).



# Methodology

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

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

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

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

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

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

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



#### CMS

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

#### NA62

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

#### DUNE

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

#### OPENCOASTS

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

#### EISCAT\_3D

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

#### PANOSC

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

#### ELI-BEAM

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

#### SeaDataNet

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

#### ELI-NP

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

#### SKA

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

#### EMSO-ERIC

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

#### SNO+

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

#### FUSION

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

#### VIRGO

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

#### HESS

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

#### WeNMR

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

#### Ice-Cube

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

#### XENON

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



## EGI Membership Impact Report

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