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Bridging the Digital Divide in the EaP Region

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EaPConnect
eapconnect.eu



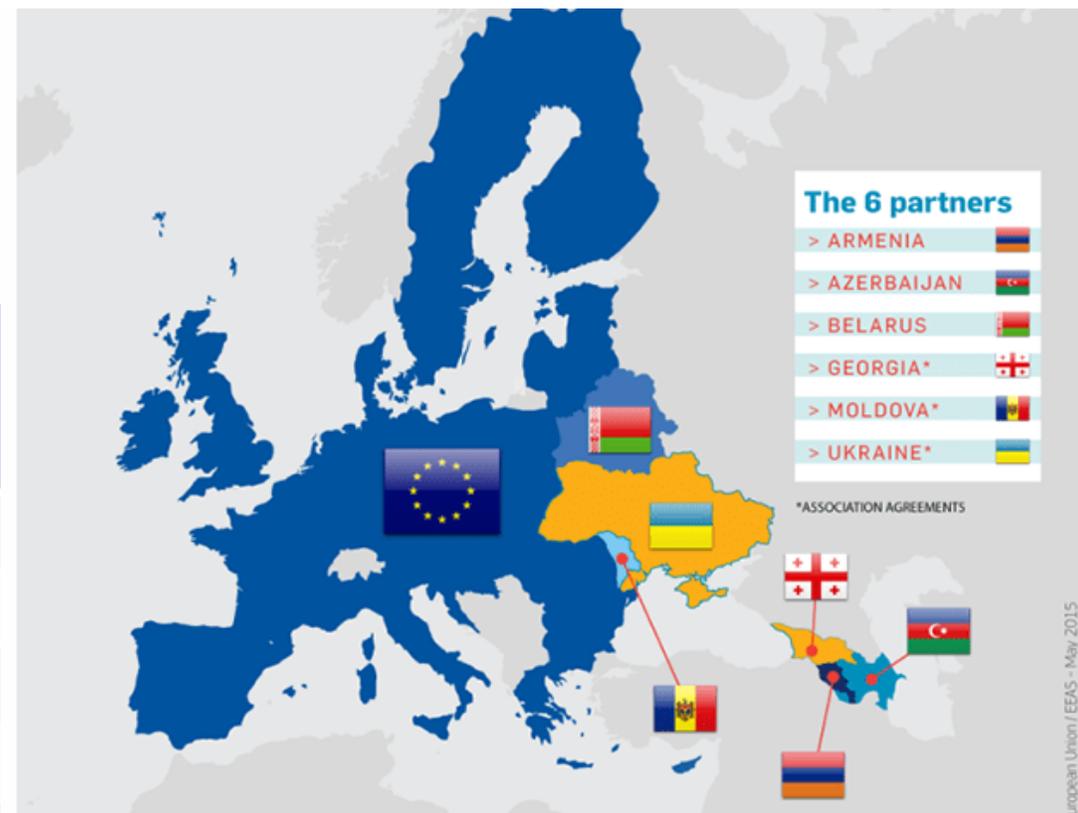
- Eastern Partnership region and EaPConnect project
- e-Infrastructure and services
- Examples of benefits for the R&E communities
- Situation in Ukraine





Eastern Partnership (EaP) is a joint initiative of the European Union and six countries Armenia, Azerbaijan, Belarus (participation suspended in 2022), Georgia, Moldova and Ukraine

	Population WB 2021 Thousands	Area Wikipedia km ²	GDP per capita WB 2021 USD
Armenia	2,791	29,743	4,966
Azerbaijan	10,138	86,600	5,388
Belarus	9,340	207,595	7,302
Georgia	3,709	69,700	5,023
Moldova	2,615	33,851	5,231
Ukraine	43,793	603,628	4,836





Budget:	1st Phase – 13M€ 2nd Phase – 10.5M€ 95% EU funding from EC DG NEAR
Duration:	1st phase: July 2015 until February 2021 2nd phase: July 2020 until June 2025
Website:	https://eapconnect.eu/
Coordinating Partner:	GÉANT
Beneficiaries:	<ul style="list-style-type: none">• ASNET-AM (Armenia)• AzScienceNet (Azerbaijan)• GRENA (Georgia)• RENAM (Moldova)• URAN (Ukraine)
European Associate Partners	GARR (Italy), GRNET (Greece), DFN (Germany), PSNC (Poland), LITNET (Lithuania)

Connect

Integrate

Strengthen

Specific objectives:

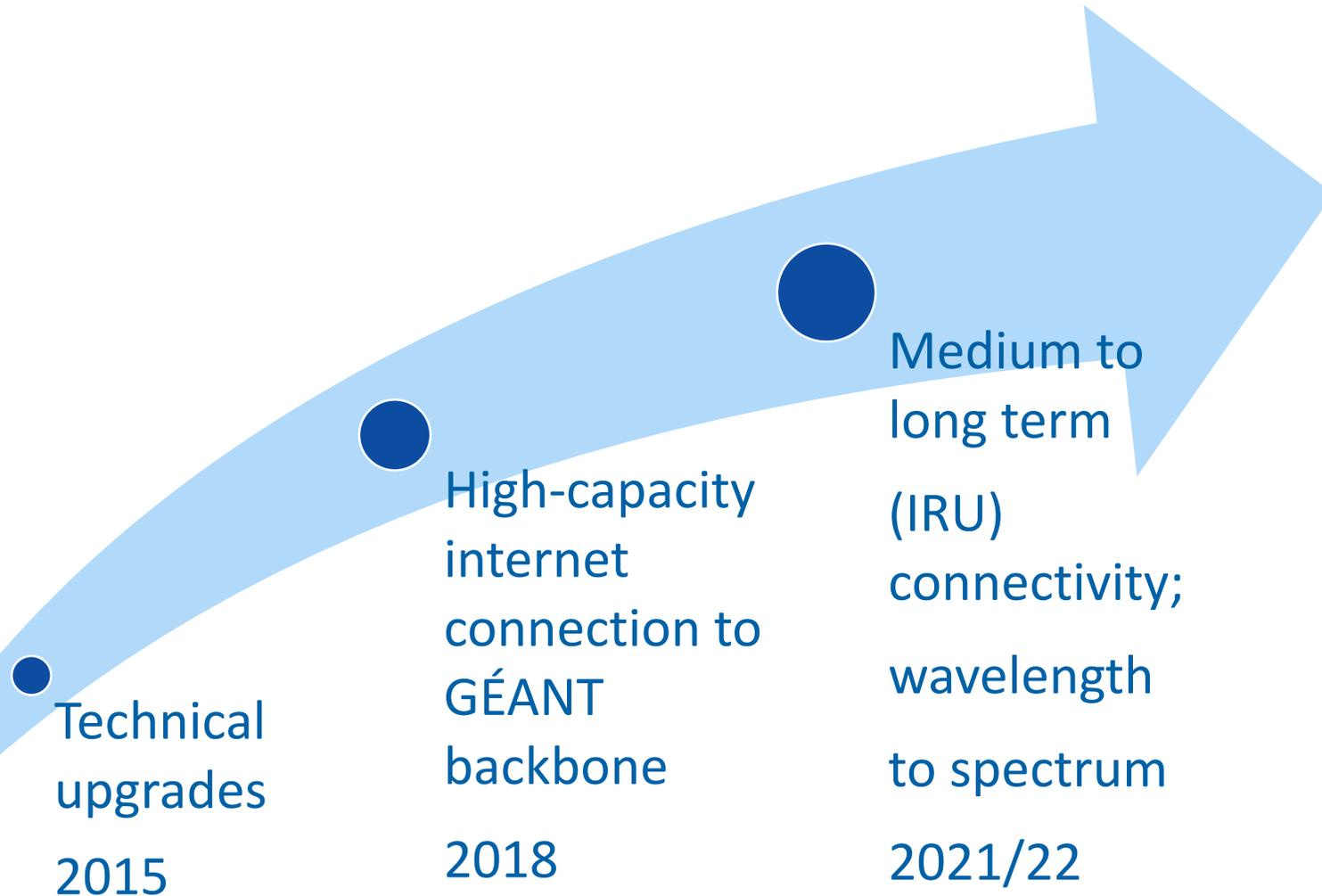
SO1: Extend network infrastructure (digital highways) to scale-up scientific exchange across borders

SO2: Increase the use of services implemented under EaPConnect and offer new services to enhance international cooperation in R&E

SO3: Strengthen EaP NRENs' position in the national R&E ecosystems

- European research and education network
GÉANT interconnects 44 National Research and Education Networks NRENs
- Serves 50 million users at 10,000 institutions across Europe and EaP countries, supporting all scientific disciplines
- 7 Petabytes of data carried per day
- +30% average annual increase in network traffic over last five years
- Current 7-year Framework Partnership Agreement signed with EC in 2022. In frame of FPA two projects GN5-1 and GN5-IC1 are under implementation with EC co-funding 70M€





- 5 connected countries
- 10 x greater capacity
- 700 000 users
- 300 institutions

Number of connected R&E institutions and number of users



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	Armenia ASNET-AM	Azerbaijan AzScienceNet	Georgia GRENA	Moldova RENAM	Ukraine URAN
Number of connected institutions	52	65	62	29*	100**
Number of users	47000	85000	88000	77000	434000 (pre- war)

* The drop in number of connected institutions in RENAM is the result of ongoing restructure of R&E sector in Moldova, some institutions were merged

**The total number of connected institutions in URAN includes 70 R&E institutions and 30 commercial entities

- GÉANT and internet connectivity
- Network traffic monitoring and analyses
- eduroam – education roaming
- eduGAIN – authentication and authorization
- Cloud
- Cybersecurity
- Videoconferencing
- LoLa - Low Latency audio-video streaming
- Digitisation of cultural heritage
- Software licences
- Country top-level domain registration
- IT Education



THE SOLISTI DELLA CAPPELLA MARCIANA CHOIR PERFORMING IN VENICE, ITALY

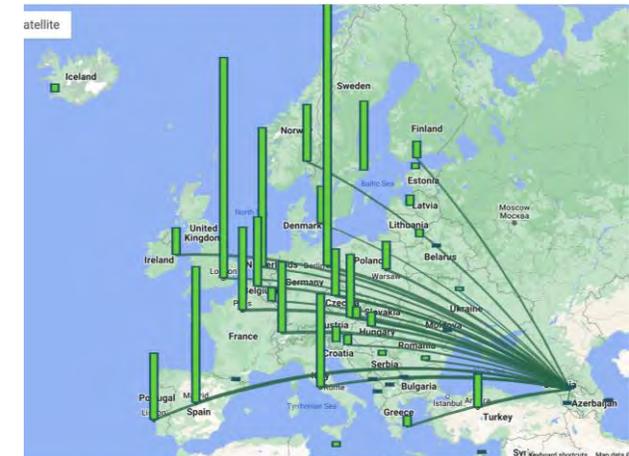
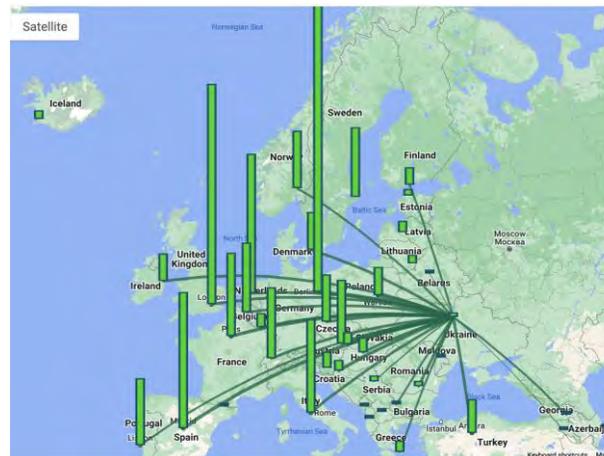


HOVER STATE CHOIR PERFORMING IN YEREVAN, ARMENIA



	Armenia ASNET-AM	Azerbaijan AzScienceNet	Georgia GRENA	Moldova RENAM	Ukraine URAN
Number of Cloud user organisations	30	6	84	7	7
Number of eduroam service locations	43	28	40	18	151
Number of eduGAIN IdP/SP	1/3	1/1	2/3	2/4	3/6

EU locations where EaP eduroam users have accessed their accounts





	Armenia ASNET-AM	Azerbaijan AzScienceNet	Georgia GRENA	Moldova RENAM	Ukraine URAN
Horizon 2020 Horizon Europe DG NEAR	19	8	23	19	11

In addition to that EaP NRENs participated in other projects co-funded by EU



EaPEC22 – “Building connections” Baku, Azerbaijan, 27-28 September 2022



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To increase the engagement between the Azerbaijani and European R&E community

160 attendees

30 speakers

15 countries

To raise visibility and strengthen connections with national policy and decision makers and EU

3 National ministries

EU Delegation

EC DG NEAR



During 2022 EaPConnect organised 8 trainings and workshops dedicated to the needs of NRENs



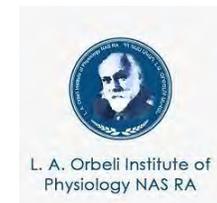
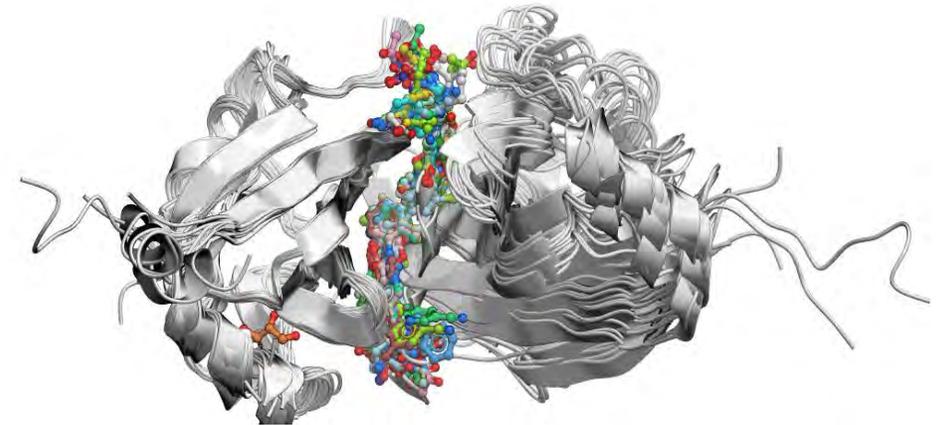
- Provides High Performance Computing
- Hydromet service can make high-resolution numerical weather prediction models
- 'Nowcasting' predicts small features such as individual storms with reasonable accuracy



Armenian State Hydrometeorological and
Monitoring Service



- Project is focused on therapeutic areas and molecular targets related to medical needs
- Platform will embrace exponentially growing biomolecular, genomics data and chemical catalogs of billions of compounds, facilitate rapid discovery of new targets or disease and treatment-associated mutations
- Development of comprehensive computational platform based on existing data and new 3D-AI methods

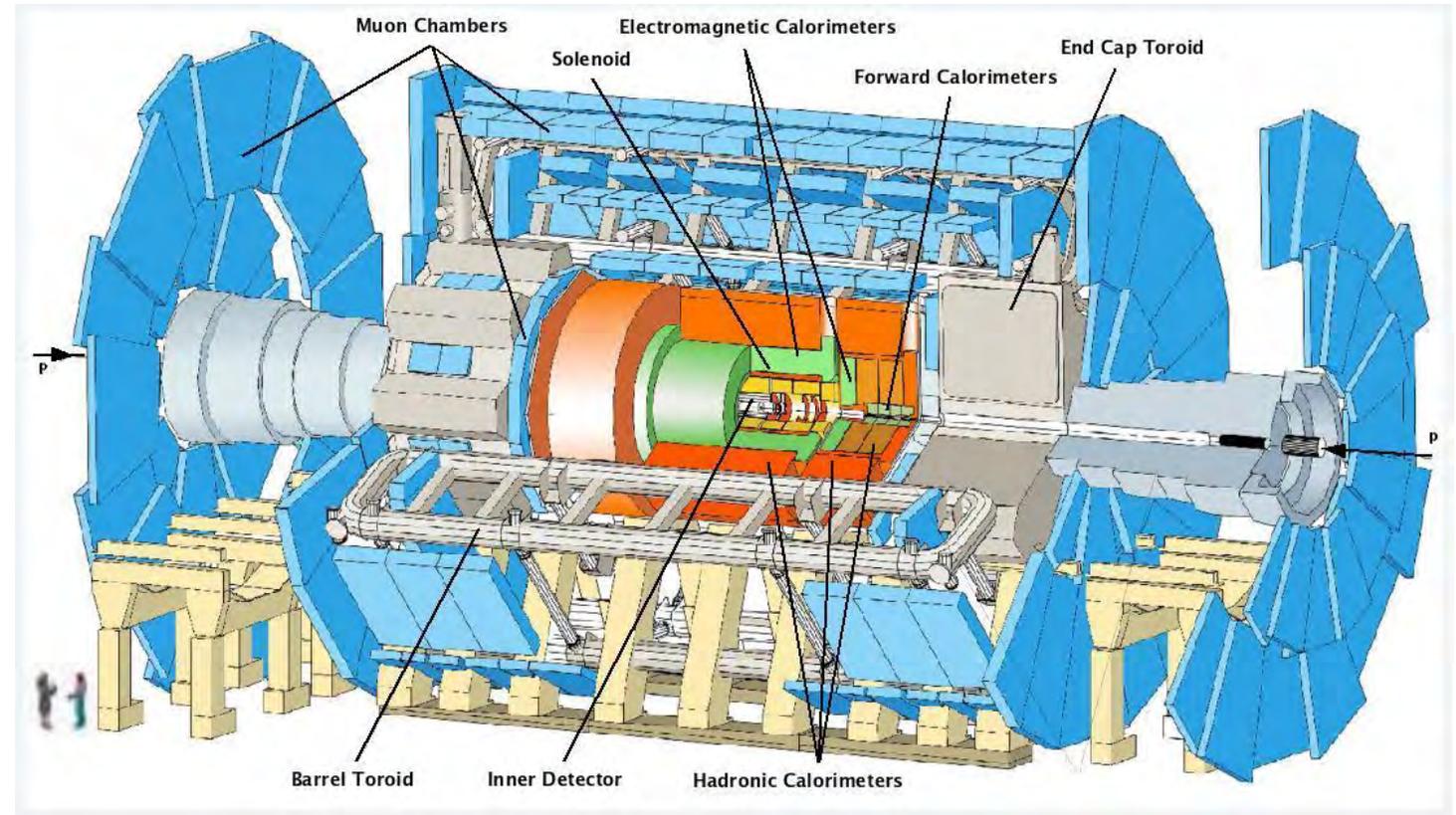


- Study of earthquakes kinematic and dynamic parameters of seismicity on territory of Azerbaijan
- Search of geophysical and geochemical seismic abnormal effects in structures and properties
- Estimating big cities seismic risks
- Collecting and analyzing information from 84 seismic and 24 GPS stations



Republican Seismic Survey Center

- Study of production and decay properties of particles in pp-collisions at CERN ATLAS experiment
- Investigation of quark-gluon plasma production in nucleus-nucleus interactions
- Establishment of distributed GRID infrastructure in Azerbaijan and its application in various fields of science



Institute of Physics

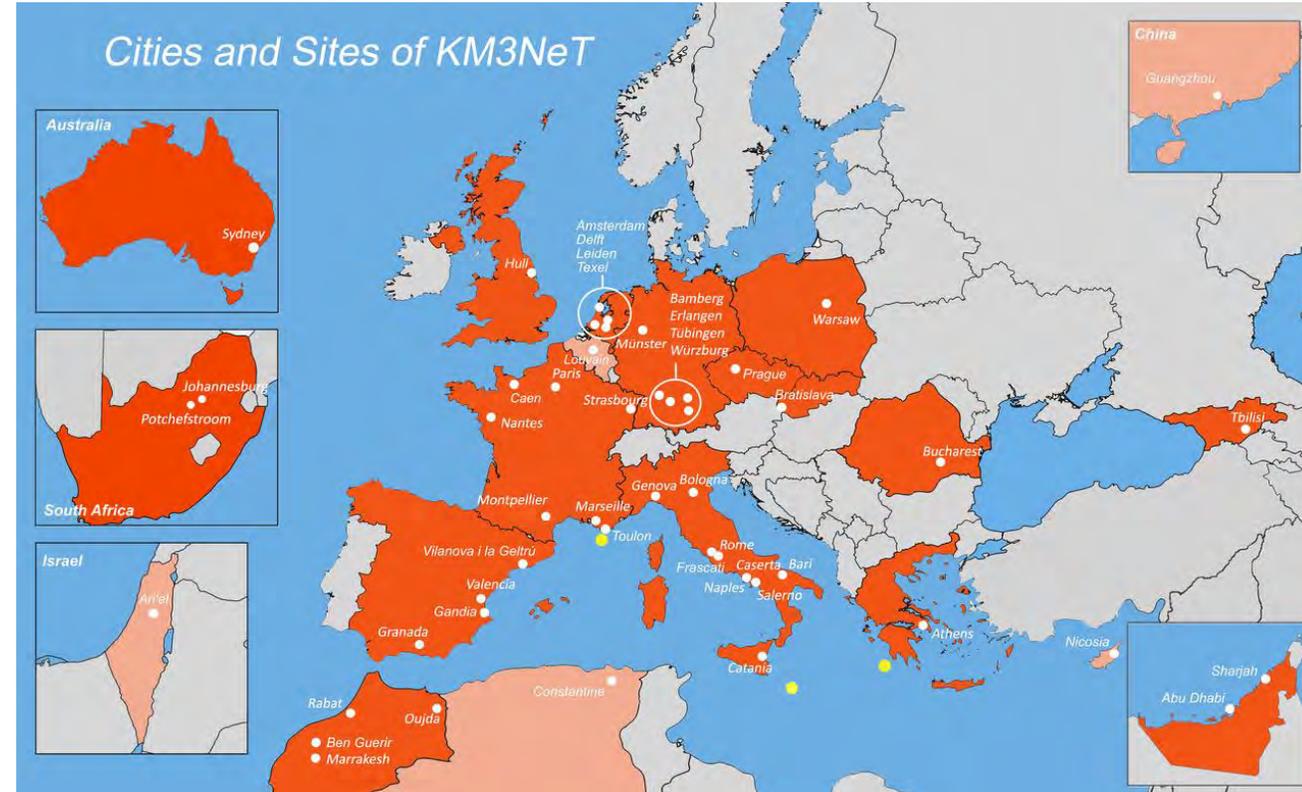


- MoU between GRENA and National Science Foundation of Georgia supporting two projects devoted to the investigation of climate change impact on territory of Georgia using set of high resolution climate models
- MoU between GRENA and National Environmental Agency to support daily weather forecast and climate change studies





- KM3NeT Neutrino Telescope in the Mediterranean is next-generation research infrastructure involving multiple partners from Europe and beyond
- Investigation of different types of neutrino properties and their oscillations could play an important role in understanding of universe
- MoU between GRENA and High Energy Physics Institute of Tbilisi State University



DICOM Network – solution for large medical datasets collection, processing, secure distribution and visualization

Challenges: i) flexible architecture for collecting large datasets of medical data from various types of equipment ii) to integrate with existing data of patients

- 400 patients/day
- 600 doctors have online access
- 6 DICOM servers & 2 DICOM portals
- 356 428 patients since 2018
- 600 814 investigations collected
- 24/7 technical & consultancy support





Institutional

The following repositories were on-boarded to EOSC:

- IREK - Institutional Repository of Economic Knowledge <https://irek.ase.md/xmlui/> developed by the Academy of Economic Studies of Moldova
- IRMS - Institutional Repository in Medical Sciences <https://repository.usmf.md/> of the Nicolae Testemitanu State University of Medicine and Pharmacy of the Republic of Moldova
- IRAS - Institutional Repository in Agricultural Sciences <http://roar.eprints.org/> developed by the State Agrarian University of Moldova

SIA Transplant - Repository of the National Transplant Agency
<https://app.transplant.gov.md/>. SIA Transplant is integrated with DICOM Network



National

Devastating impact of the war in Ukraine



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Kharkiv University of Humanities

Full scale terrible war started on 24 February 2022

The UN Refugee Agency UNHCR records **8,113,170** refugees from Ukraine across Europe as of 13 March 2023. This amounts to around 20% of the Ukrainian population (estimated by Eurostat as at 2021)

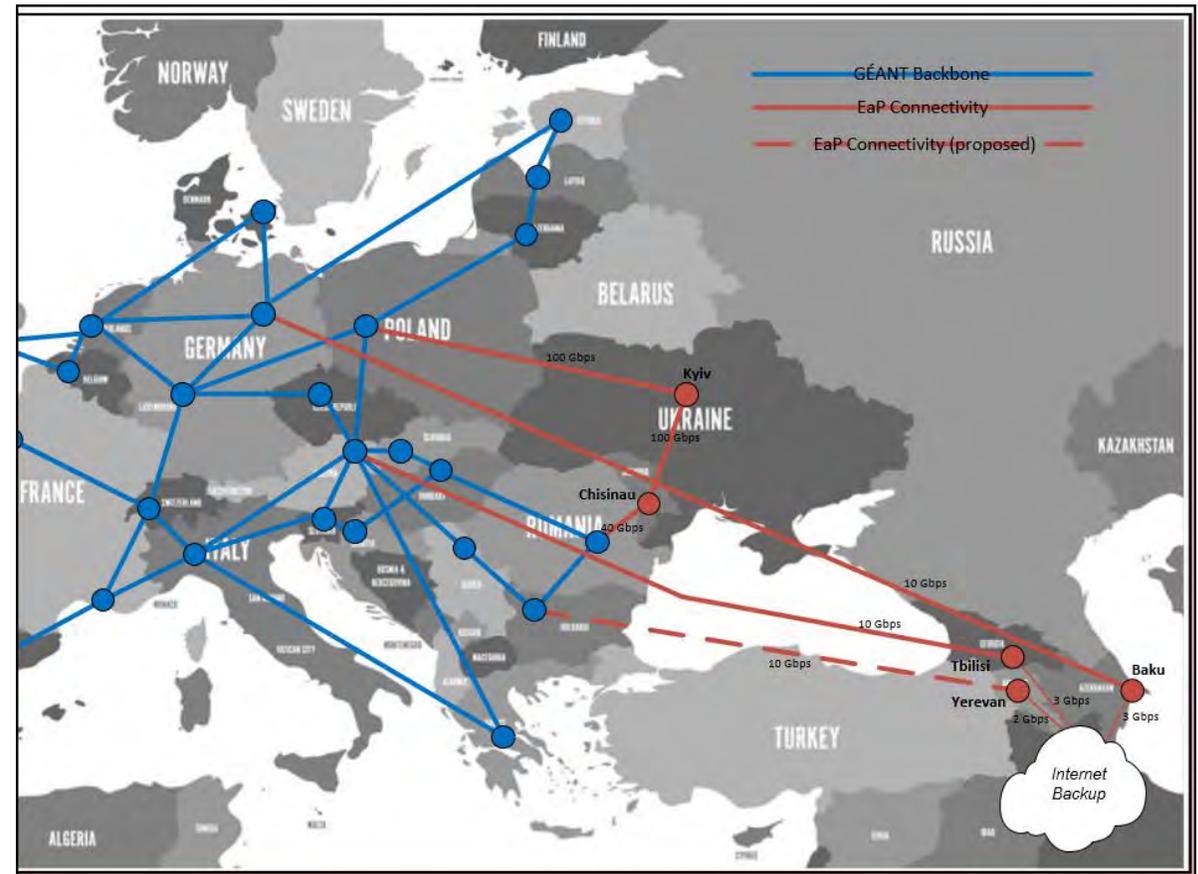
The total damage to physical infrastructure between February 24, 2022 and February 24, 2023 caused by the war was estimated at **135 billion U.S. dollars**

Many cities and villages are severely damaged, among them Kharkiv the second city in Ukraine by the density of science and education. All research and education entities in Kharkiv are damaged

More than 2000 educational entities (schools, universities, research institutes) were hit by bombings and shelling in Ukraine, many of them were completely destroyed



- Poznan-Kiev-Chisinau spectrum service covers Ukraine and Moldova. The spectrum service term is 15 years, potentially upgradeable up to 3x400Gbps capacity. Currently, the capacity is 100Gbps for both sections
- Upgrade URAN network backbone capacity in Kyiv
- Upgrade URAN data center
- Connecting new institutions in Kiev
- Increase number of users and implementation of new services



Staff safety

- Relocation to safer places
Ukraine or abroad
- Weekly online meetings
- Support from GÉANT colleagues



Remote mode of operation

- Network damages, equipment loss, impossible to get to the office
- Electricity emergency blackouts up to 20 hours per day
- For remote control of equipment
eduVPN
- For team communications
eduMEET + Telegram



Ensuring the network operation and providing digital services 24/7



Supporting universities relocated to the Western Ukraine
providing needed equipment and connectivity to URAN network



Addressing user needs to protect their archives and data from damage caused by missile attacks
disk space from NORDUnet



Addressing the user needs in computing and storage resources
deployment of virtual machines for free at Amazon AWS and Microsoft Azure data centres



Financial support from GÉANT community via Vietsch Foundation
funds donated by GÉANT NRENs are used to cover URAN's network operation costs



URAN continues to support R&E community of Ukraine by providing digital services and access to high-speed GÉANT connectivity

Some of the current projects:

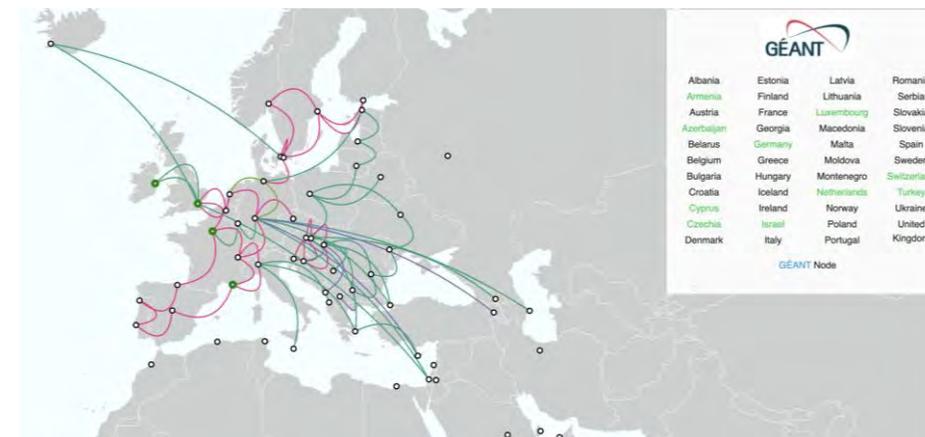
- Searching for sponsors to support sustainable cloud services for Ukrainian universities



- Ensuring sustainability of Ukrainian universities participating in UK-Ukraine Twinning Initiative



- With the support of European Commission ensuring high capacity reliable connectivity and services to meet requirements of research and education community of EaP region
- Strong collaboration with GEANT and EU NRENs enabling to share expertise in important areas e.g. Trust & Identity, Security, Cloud services, etc.
- Participation in EU initiatives European Open Science Cloud EOSC, High Performance Computing HPC and Quantum Technologies
- Close cooperation with national governments and major stakeholders to facilitate integration of universities and research institutes in international R&E community





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Thank you!
Any questions?

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