

# e-Infrastructure Project Area

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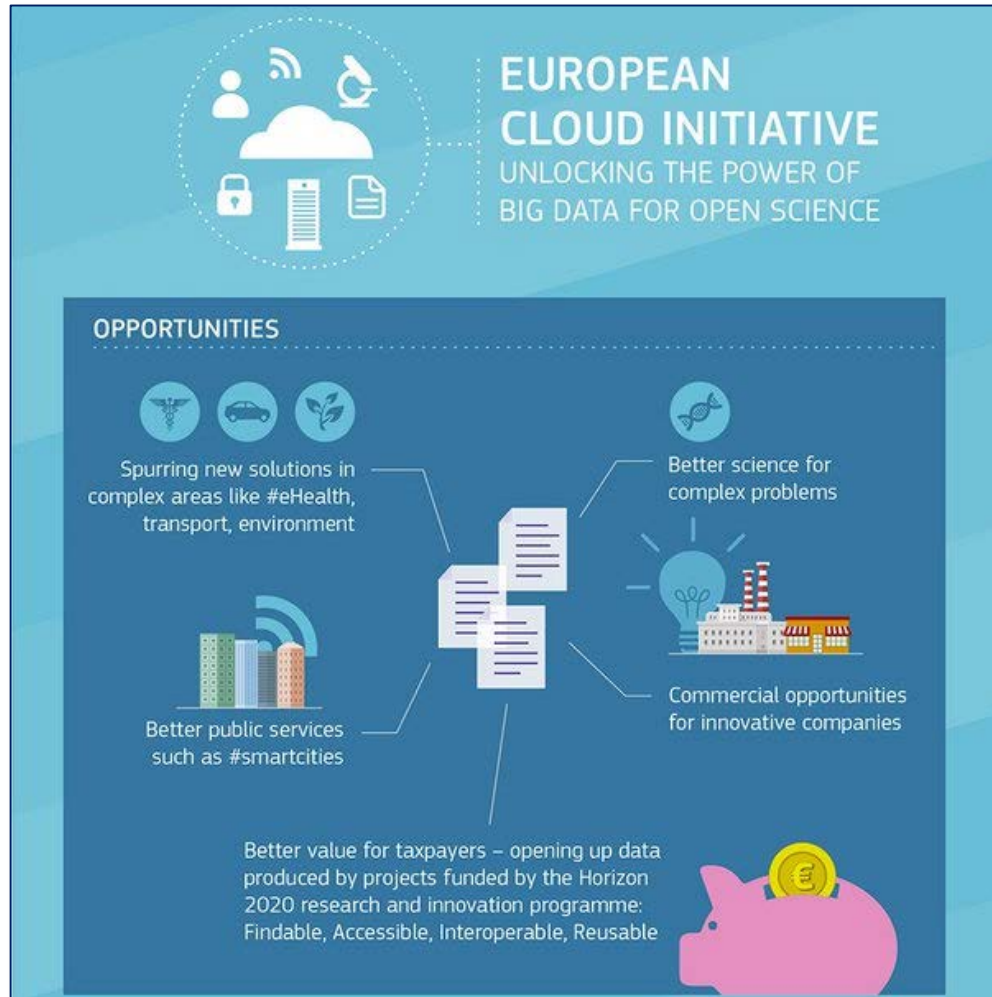
A large dark blue triangle pointing upwards, centered on the slide. A semi-transparent light blue rectangle is overlaid on the middle of the triangle, containing text.

## e-Infrastructures

The comprehensive ICT infrastructures that are needed to enable the complex, multi-disciplinary and globalised practice of modern science



# The framework: the European Cloud Initiative



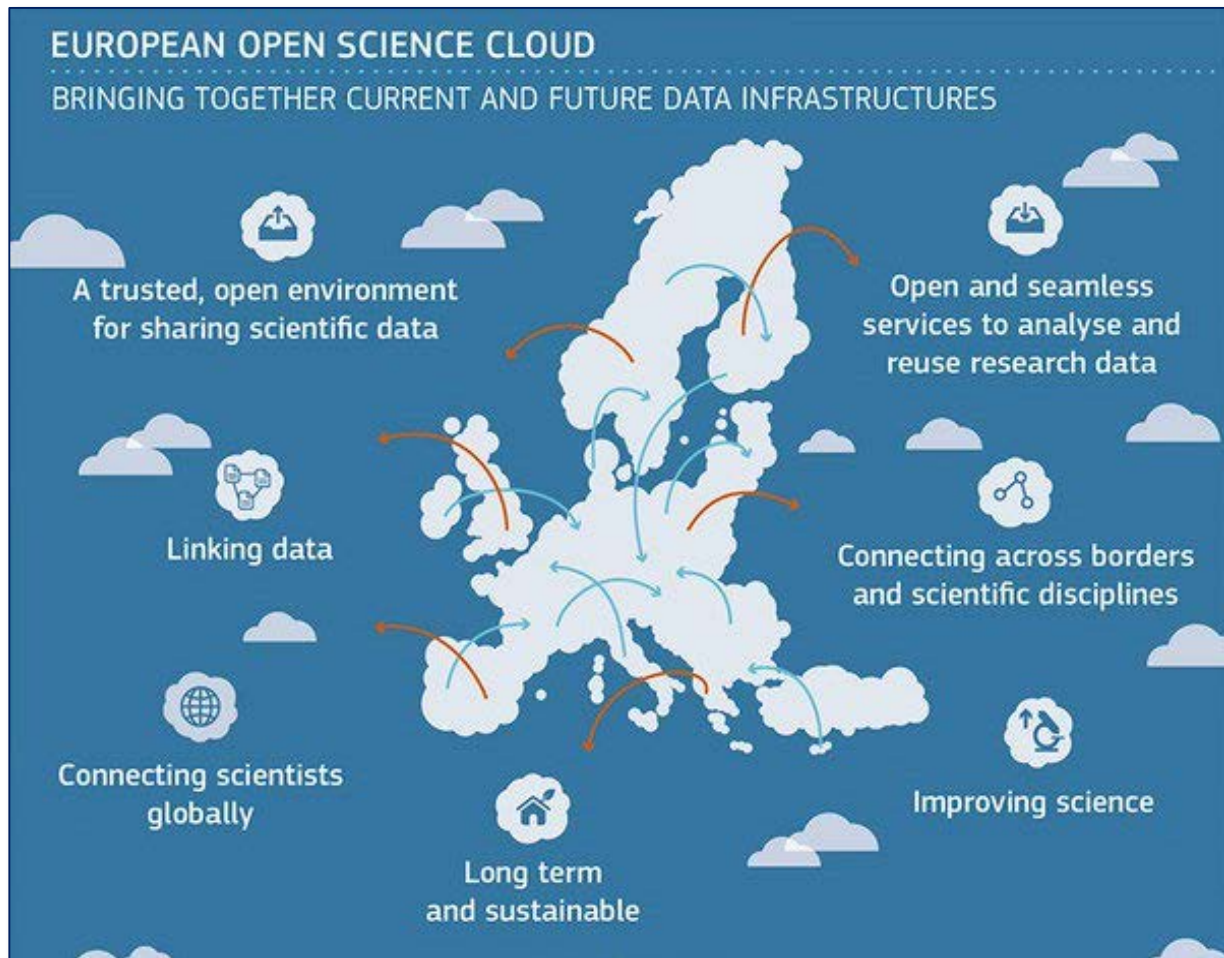
## European Open Science Cloud (EOSC)

*A **federated, globally accessible** environment where researchers, innovators, companies and citizens can **publish, find and re-use** each other's **data and tools** for research, innovation and educational purposes under well defined, secure and trusted conditions, supported by a sustainable and just and value-for money model*

## European Data Infrastructure

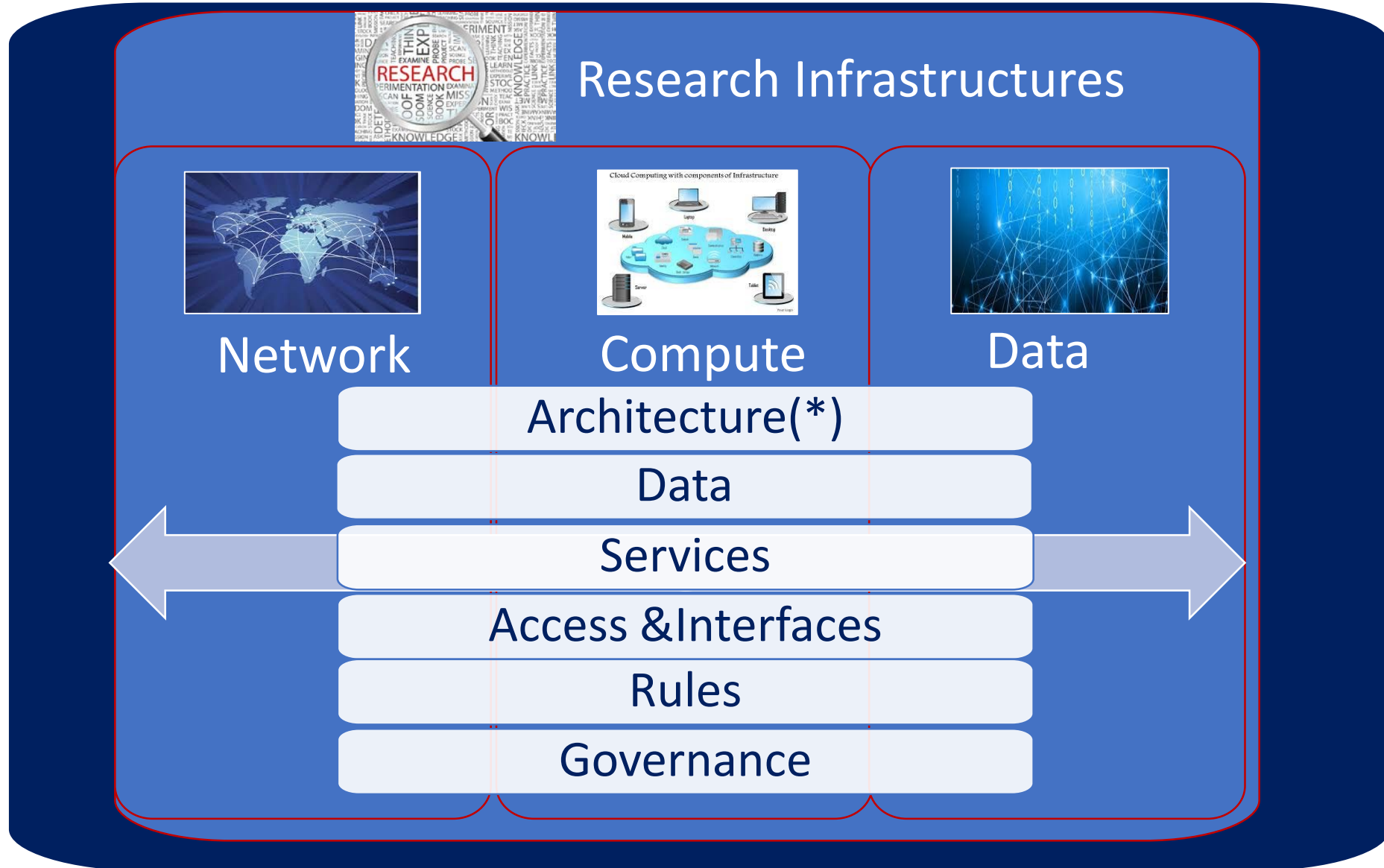
*World-class HPC capability and high-speed connectivity as well as leading-edge services benefitting from them*

# The European Open Science Cloud (EOSC)



- **Open and evolving federation of existing research supporting infrastructures** and other resources
  - Generic network, compute and data infrastructures
  - Domain specific research infrastructures
  - Thematic platforms like, for example, the Copernicus Data and Information Access Services (DIAS)
- Supporting **multidisciplinary and cross-disciplinary research**
- Facilitating **FAIR data management**
- Enabling **cooperation** and as early as possible **sharing of research outcomes**

# Project Area dimensions



(\*) Implementation Roadmap for the European Open Science Cloud [https://ec.europa.eu/research/openscience/pdf/swd\\_2018\\_83\\_f1\\_staff\\_working\\_paper\\_en.pdf](https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf)

# Challenges

- To contribute to a better definition of the **EOSC Architecture**
- Regarding **Data**:
  - Effective and mostly automatic implementation of FAIR principles
  - Data products traceability and reproducibility
  - Transparent knowledge extraction
- Regarding **Services**:
  - Seamlessly access and use of provided services
  - Use across infrastructures boundaries in complex workflows
  - Execution workflows respecting service terms of use, trust, security and performance requirements
- Regarding **Governance and Participation Rules**
  - To provide services supporting their implementation and monitoring



# Contributors and competences



Typologies of ICT infrastructures

Six action lines of EOSC development

	Network Infra	Computing Infra	Data Infra
Architecture	IIT	ISTI, ICAR	ISTI, IREA, IIT, ICAR
Data	IIT	ISTI, IREA, ICAR	ISTI, IREA, IMATI, IIT, ICAR
Services		ISTI, IREA, ICAR	ISTI, IREA, IMATI, IIT, ICAR
Access and Interface		ISTI	ISTI, IREA, ICAR
Rules	IIT	ICAR	ISTI, IREA, IIT, ICAR
Governance	IIT	ICAR	ISTI, IREA, IIT, ICAR

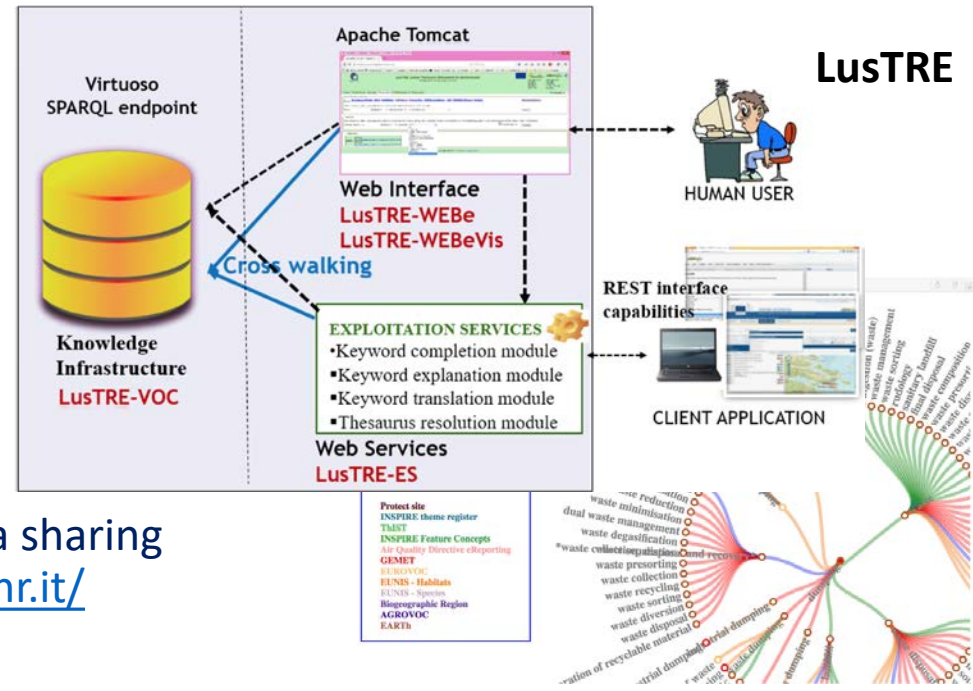
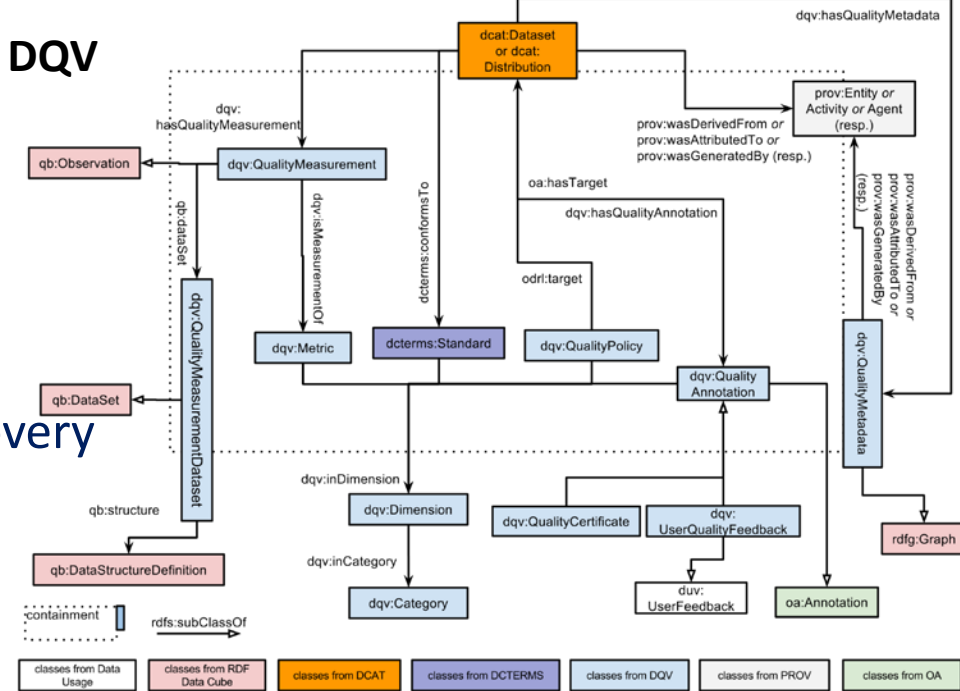
# DATA action line

	Network Infra	Computing Infra	Data Infra
Architecture	IIT	ISTI, ICAR	ISTI, IREA, IIT, ICAR
Data	IIT	ISTI, IREA, ICAR	ISTI, IREA, IMATI, IIT, ICAR
Services		ISTI, IREA, ICAR	ISTI, IREA, IMATI, IIT, ICAR
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Governance	IIT	ICAR	ISTI, IREA, IIT, ICAR



# IMATI-DATA

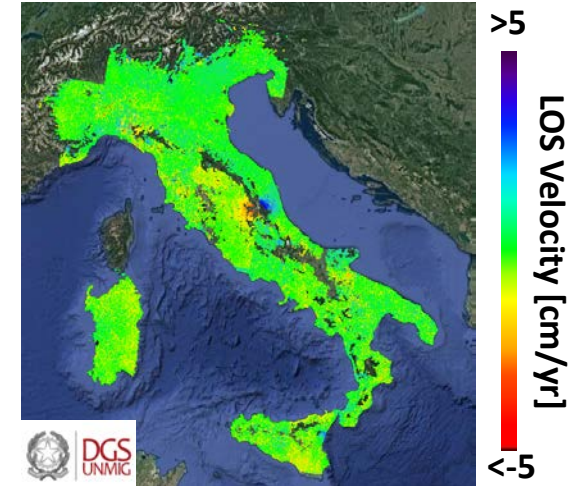
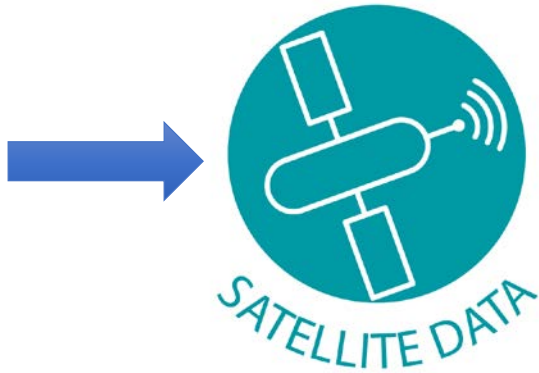
- Methods addressing provenance provision for reproducibility and dependability.
- Efforts in standardization for interoperability and information discovery
  - How to share data on the web?
    - W3C Data on the Web Best practice(DWBP) <https://www.w3.org/TR/dwbp/>
  - How to document data quality?
    - W3C Data Quality Vocabulary (DQV) <https://www.w3.org/TR/vocab-dqv/>
  - How to document data catalogs?
    - W3C Data Catalog Vocabulary (DCAT) –revision in progress <https://www.w3.org/TR/vocab-dcat-2/>
- Domain ontologies definition (<http://visionair.ge.imati.cnr.it>)
- Reuse and extension of Linked Data architectural
  - LusTRE: Linked Thesaurus fRamework for Environment to facilitate data sharing across different Environmental disciplines. <http://linkeddata.ge.imati.cnr.it/>
  - LusTRE Showcase <http://showcase.eenvplus.eu/client/thesaurus.htm>



# IREA – DATA: EPOSAR Systematic Processing

National scale  
ground deformation mapping

EPOSAR Service  
Copernicus Data



- EPOS is a **pan-European ESFRI infrastructure** in the field of Solid Earth science
- IREA coordinates the activities to build the EPOS **Thematic Core Service (TCS) Satellite Data (SD)**
- TCS SD coordinates the satellite community contributing to EPOS and guarantees **virtual access** to satellite products and services, by also providing a legal, governance and sustainable framework
- IREA is one of the EPOS Service Providers within TCS SD by supplying the **EPOSAR service**, based on the infrastructure of IREA's remote sensing lab
- EPOSAR provides to the Solid Earth science community systematic and on-demand **advanced InSAR products** by processing Copernicus Data



# IREA – DATA: EDI metadata Editor

EDI – A Template-Driven Metadata Editor for Research Data (<http://edidemo.get-it.it>)

EDI is a general purpose, template-driven metadata editor for creating XML-based descriptions. Originally aimed at defining rich and standard metadata for geospatial resources, it can be easily customized in order to comply with a broad range of schemata and domains.



[https://github.com/SP7-Ritmare/EDI-NG\\_client](https://github.com/SP7-Ritmare/EDI-NG_client)



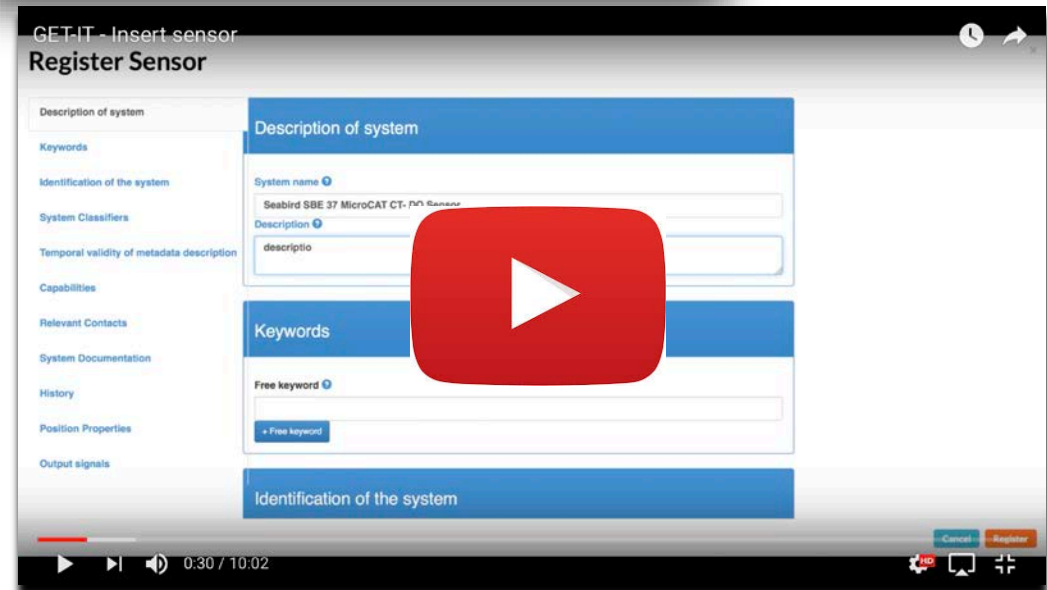
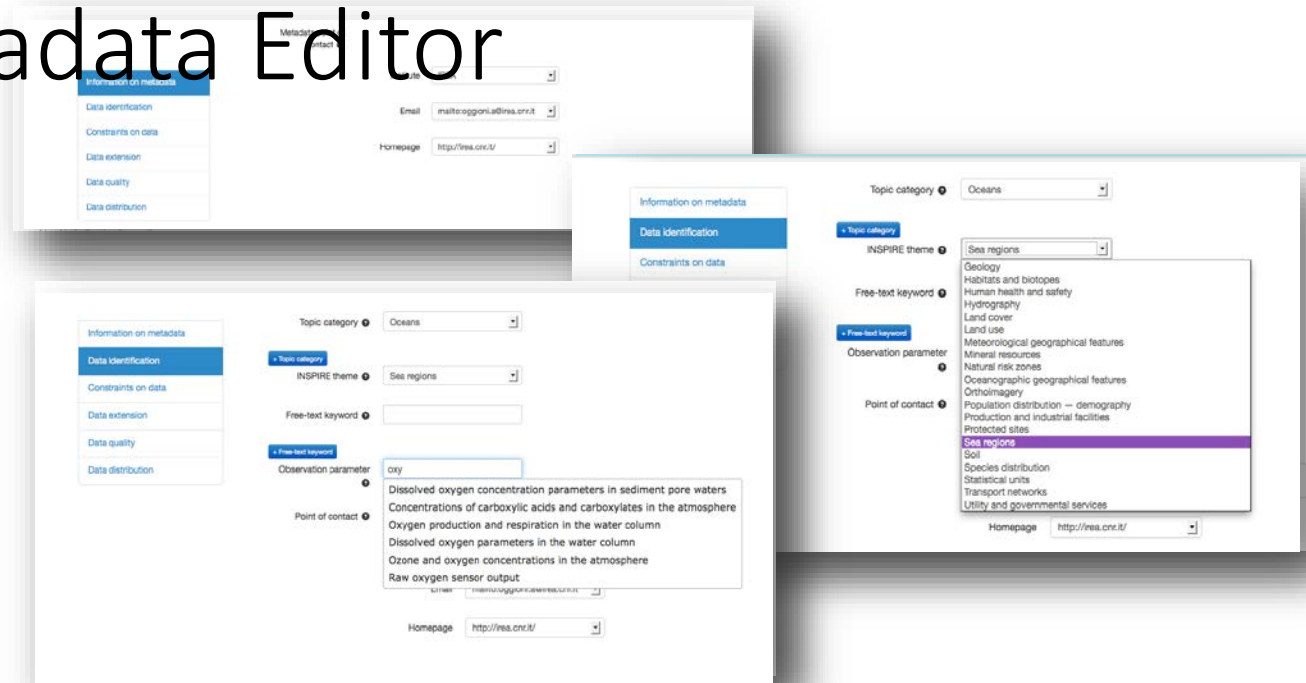
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[ireami/eding-client](http://ireami/eding-client)



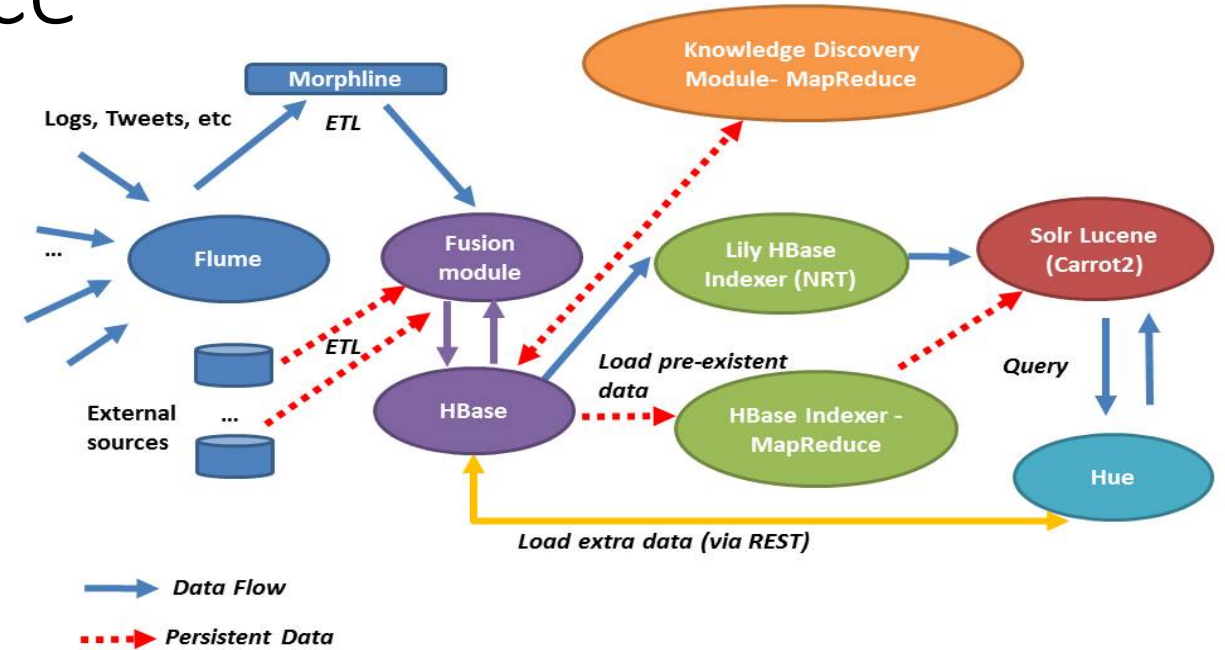
<http://geodati.gov.it/geoportale/eng/news/227-edi-un-nuovo-editor-per-i-metadati-rndt>



<https://www.youtube.com/watch?v=OVZxqqEDHm0>



# ICAR-DATA: Data Alliance



- D-ALL Data Alliance is a huge project for building a reliable data infrastructure for user profiling
- ICAR coordinates the activities to build the Big Data Architecture module
- The module is built by leveraging efficient approaches for data extraction, transformation and loading
- ICAR is involved by ADALab and the infrastructure will be the basis for the behavioural analysis model that will provided companies joining the Data Alliance with useful insights on data they share within the project activities

# SERVICES action line

	Network Infra	Computing Infra	Data Infra
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# IMATI –SERVICES (1)



**VISIONAIR - VISION Advanced Infrastructure for Research**

<http://visionair.ge.imati.cnr.it/>

- 3D content-based multi-criteria search methods;
- Data processing services;
- Workflow specification and execution for 3D data processing;
- Methods for automatic metadata extraction;
- Documentation of scientific products.

The screenshot displays the Visionair web interface, which is a platform for 3D visualization-based research. The top navigation bar includes links for Home, What We Offer, Propose New Project, Events and Deliverables, Partners, Users/Links, and Intranet. The main content area is divided into several sections:

- Workflow Repository:** A sidebar menu with options like Browse Workflow, Upload Workflow, Remove Workflow, Upload Specific Tool, and Workflow Ontology Tutorial.
- Executable Web Services:** A section for single-step web services and web service workflows.
- User Group Management:** Options to create new user groups or edit/delete existing ones.
- Credits:** A list of projects and their details, including the V89 project, PRODIGE project, and FOCUS K3D project.

The main content area features two workflow execution examples:

- Executable workflow using web services no.1:** From acquisition to 3D model creation - with cleaning of acquired data. The workflow consists of three steps: Cleaning of scanned data, Mesh smoothing & reconstruction, and Simplification. A 'Initiate workflow no. 1' button is visible.
- Executable workflow using web services no.2:** From acquisition to 3D model. A 'Sampling of scanned data' button is visible.

Below the workflow examples is a search interface for the Shape Repository:

- Browse by Category:** A grid of checkboxes for various model types, including Point Set, Non Manifold BRep, Parametric Surface, Motion Capture, Key Frame, Multi Dimensional Structural Descriptor, Manifold Surface Mesh, Manifold Surface BRep, Manifold Volume BRep, Manifold Volume Mesh, Multi Resolution Model, Raster Data 2D, Non Manifold Mesh, Centre Line Graph, Implicit Surface, Parametric Curve, Contour Set, Movie, and Dynamic MRI.
- Manufacturing Filters:** Dropdown menus for Type (All elements), Representation (At least one shape model...), Worksteps (All products...), and Process (--- Select an existing process entity... ---).
- Display Options:** A section for showing models per page, sorting by Name, and displaying single models and group representatives.

At the bottom, there are search results for 'Boehringer NG 200 CNC lathe', 'CAD AMPT WS', and 'CAD Beam structure', each with a thumbnail and detailed metadata.



# IMATI-SERVICES (2)

**GECA RDC** <http://geca.area.ge.cnr.it>

- support to researchers in order to find bibliographical resources
- structured as a RDBMS;
- developed upon semantic and descriptive standards and metadata shared internationally (UNIMARC, XML, OAI-PMH, ISBD, REICAT);
- bibliographic and authority control tools;
- integrated with POLARCNR (<http://polarcnr.area.ge.cnr.it>);
- it provides various bibliographic services (document delivery, ILL loan, sharing of digital resources)

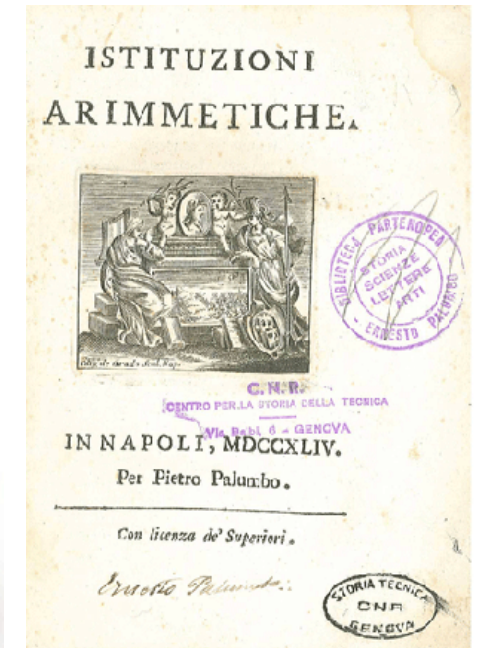
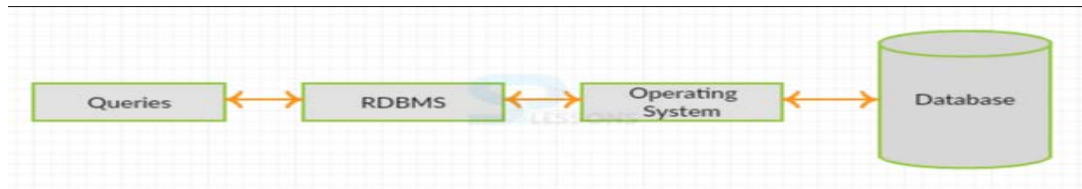


Catalogo Collettivo del Sistema Bibliotecario del [Consiglio Nazionale delle Ricerche](http://www.cnr.it)



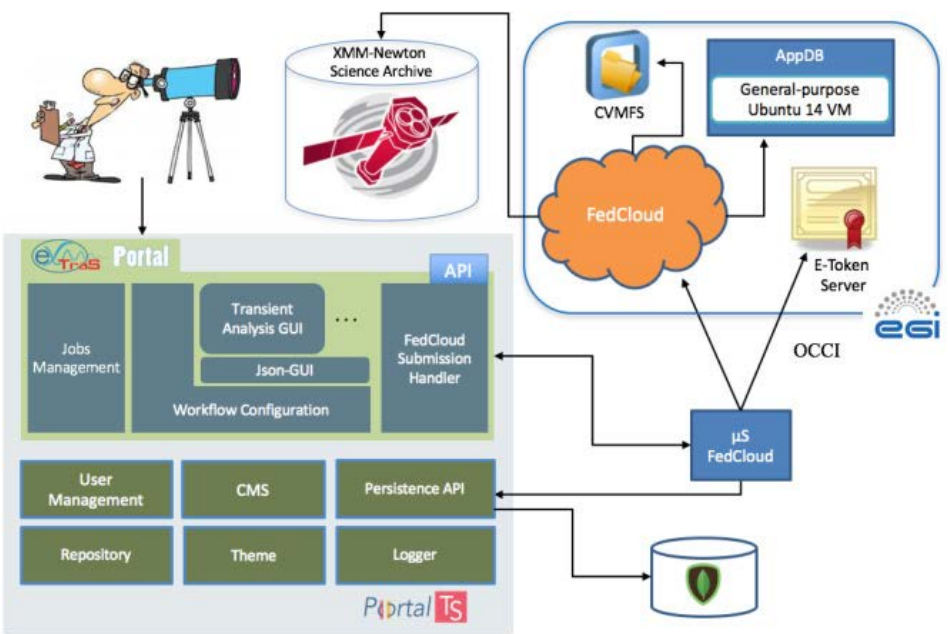
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Scanco UNIMARC
LEADER 00981csl0 2200253 4500
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005 20150601000000.0
011 $a1872-8480
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110 $aaaa|||||0|||
200 1 $aApplied mathematical modellingsbDocumento elettronico
207 1 $aVol. 1 (1976)-
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215 $aNumeri
304 $aUltima verifica su ScienceDirect: 01/06/2015
306 $aThis journal has an Open Archive
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856 4 $uhttp://www.journals.elsevier.com/applied-mathematical-modelling
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**Consorzi CNR: Portale risorse on-line**

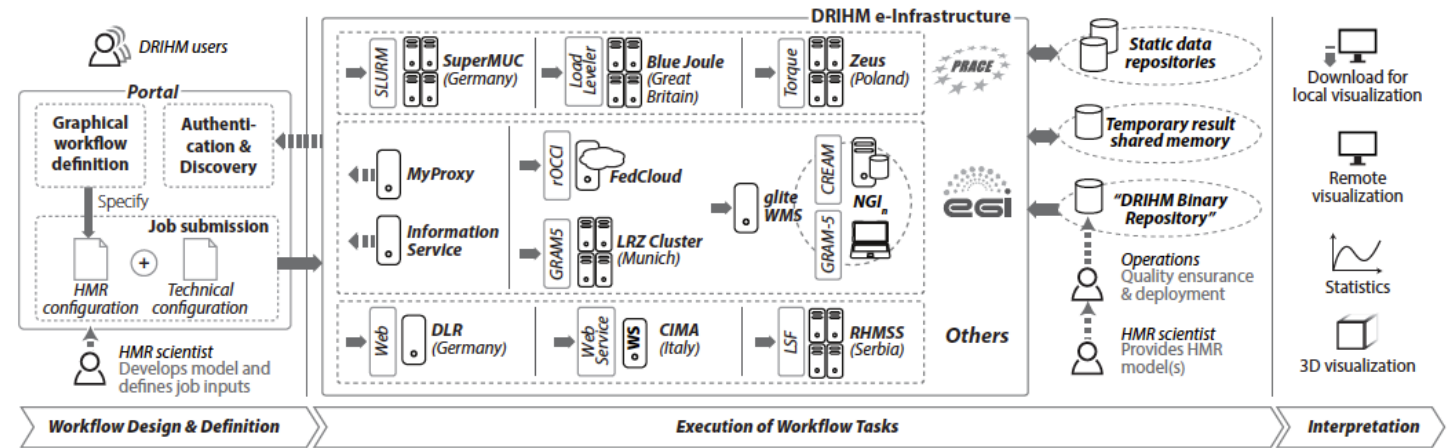


# IMATI-SERVICES

The **EXTras portal** is a **science gateway** for the astrophysics community devoted to the search and characterization of variable sources in the soft X-ray energy range by exploiting past, present and future XMM-Newton observations.



(3) The **DRIHM e-Infrastructure** provides advanced end-to-end **hydrometeorological (HM) services** (models, datasets, and postprocessing tools), with the aim of paving the way to a step change in how scientists can approach studying high impact weather events (e.g. flood and flash flood). These services now make it possible to work in a modular environment and enhance the modelling, workflow composition and data processing capabilities of the HM community, featuring several different computing paradigms (HPC, Grid and Cloud).

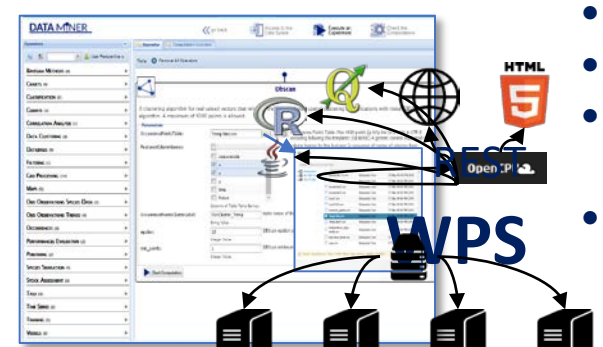


# ISTI-SERVICES

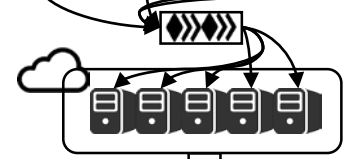
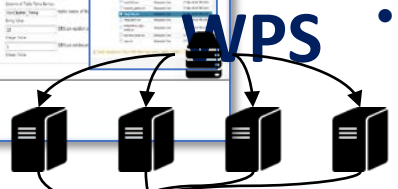
## Data processing & knowledge generation



Unique access to perform **data mining and statistical operations** on heterogeneous data, which may reside either at client side or be remotely hosted.



- Experiments on Big Data
- Sharing inputs and results
- Save the *provenance* of experiments
- Supports R-R-R of experiments



- Input/Out
- Parameters
- Provenance



Openly accessible (CC-0) **graph of links between dataset and literature objects and dataset and dataset objects**. Links (and objects) are provided by data sources managed by publishers, data centers, or other organizations such as CrossRef, DataCite, and OpenAIRE.



Harvesting of links





# IREA – SERVICES: InSAR processing on-demand



geohazards  
tep

**On-line Ground Motion Service based on the ESA's Geohazards Exploitation Platform (GEP)**

The screenshot displays the geohazards InSAR processing interface. It features a central map showing a color-coded InSAR result visualization of ground motion. A metadata window is open over the map, displaying details for the job 'InW\_fcasu\_20180607S1A\_20180619S1A\_V26Y'. A color scale at the bottom of the map indicates ground motion in centimeters, ranging from 0 to 2.8. Below the map, a 'Data/Result Selection' panel shows a list of search results with checkboxes for selection. On the right side, a 'Processing Parameters' panel contains various input fields and dropdown menus for configuring the processing job.

**Result Visualization**

**Processing Parameters**

**Metadata (ISO-19115)**

Property	Value
DDSS_ID	WRAPPED_INTERFEROGRAM
Product_format	GEOTIFF
Product_size	197291134
Bounding_box	-1.6712478 -93.160932 0.61096589 -90
Bounding_box_wkt	POLYGON((-93.160932 -1.1865199,-92
License	https://creativecommons.org/licenses
User_ID	fcasu
Software_version	CNR-IREA P-SBAS 26
Applied_algorithm_description	Parallel SBAS Interferometry Chain
Main_reference	10.1109/TGRS.2002.803792, 10.1109/J
Date_of_measurement_start	2018-06-07T11:50:06.198343Z
Date_of_measurement_end	2018-06-19T11:50:07.013065Z

**Data/Result Selection**

Current search result

Discovery feed for local data

- Coh\_fcasu\_20180607S1A\_20180619S1A\_V26Y
- InU\_fcasu\_20180607S1A\_20180619S1A\_V26Y
- InW\_fcasu\_20180607S1A\_20180619S1A\_GOLD\_V26Y
- InW\_fcasu\_20180607S1A\_20180619S1A\_V26Y

Total results 96 | sel.all | inv.sel. | Remove all | Save

- S1B SLC IW\_DP L1 VV, VH 5 2017-12-31T00:39:05.2897410Z/2017-12-31T00:39:33.1733620Z
- S1A SLC IW\_DP L1 VV, VH 22 2017-11-20T05:11:53.1871560Z/2017-11-20T05:12:21.1385550Z
- S1B SLC IW\_DP L1 VV, VH 22 2017-11-14T05:11:16.8183560Z/2017-11-14T05:11:44.7677550Z

**Processing Parameters**

Job title  
DEVELOP WF - CNR-IREA P-SBAS Sentinel-1 processing on-c

Sentinel-1 input SLCs \*  
[Dropdown]

Latitude of the Reference Point \*  
[Dropdown]

Longitude of the Reference Point \*  
[Dropdown]

Bounding Box  
[Dropdown]

Polarization \*  
vv

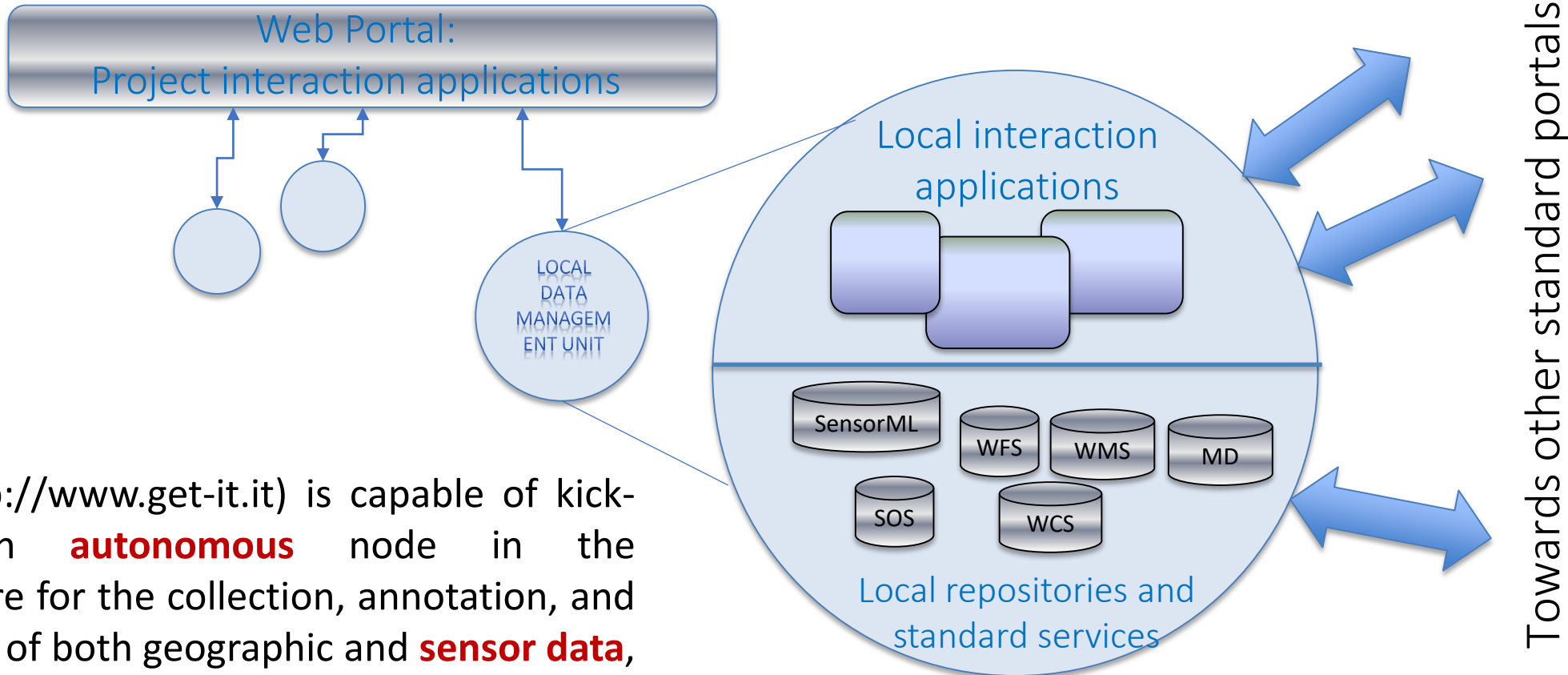
Processing Mode \*  
MTA

DEM Type \*  
srtm\_1

APS Filter Window Length \*  
250

# IREA – SERVICES: GET-It suite

Creation of GET-It, an open sw suite to easily create and populate **interoperable web services** to deliver and **access** data; to easily create metadata in standard profiles for **finding** data and sensors; lifting interoperability / **reuse** promotion by semantic MD enrichment (towards semantic level interoperability and constant update of MD items)



GET-IT (<http://www.get-it.it>) is capable of kick-starting an **autonomous** node in the infrastructure for the collection, annotation, and deployment of both geographic and **sensor data**, in all **geographic domain sectors**.

# IIT – SERVICES



- **6MoNPlus:** monitor and control geographically distributed Dual-Stack (IPv4/IPv6) network infrastructure

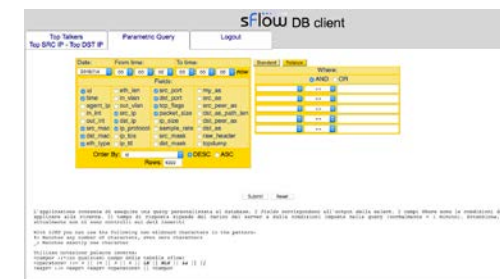
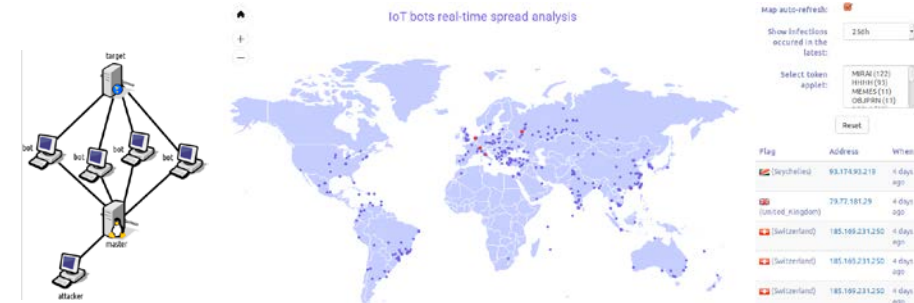
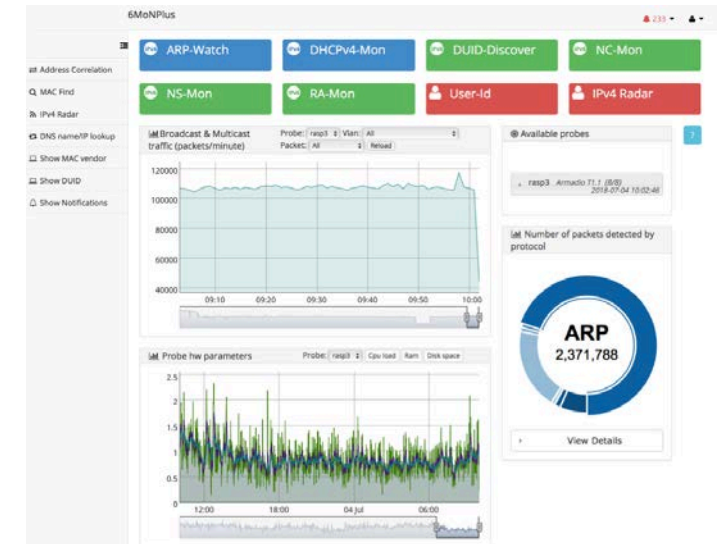
- Collecting router-advertisements
- Discovering IPv6 multicasts, ARP and DHCP servers
- neutralize rogue IPv6 routers and DHCP servers
- <https://www.6monplus.it>

- **Botnet discovering**

- Discovering how botnets spread out over the Internet
- Collect, analyze and classify malware samples
- Monitoring malware activities are based on honeypots/sandboxes

- **sFlow analyzer**

- Statistical network monitoring tool used for anomaly detection of data flows



# ICAR-SERVICES: Identity Management



- **Spidasec** is a project whose main goal is to identify proper services for identity management in distributed infrastructures
- ICAR coordinates the activities for defining **Machine Learning and Data Analytics approaches for risk analysis of SPID infrastructure** and its proper use
- The module is built by leveraging efficient algorithms for outlier detection and user profiling
- ICAR will also drive the experimental assessment performed in cooperation with University of Calabria for testing the approaches in a real life scenarios, i.e., University Students



# ARCHITECTURE action line

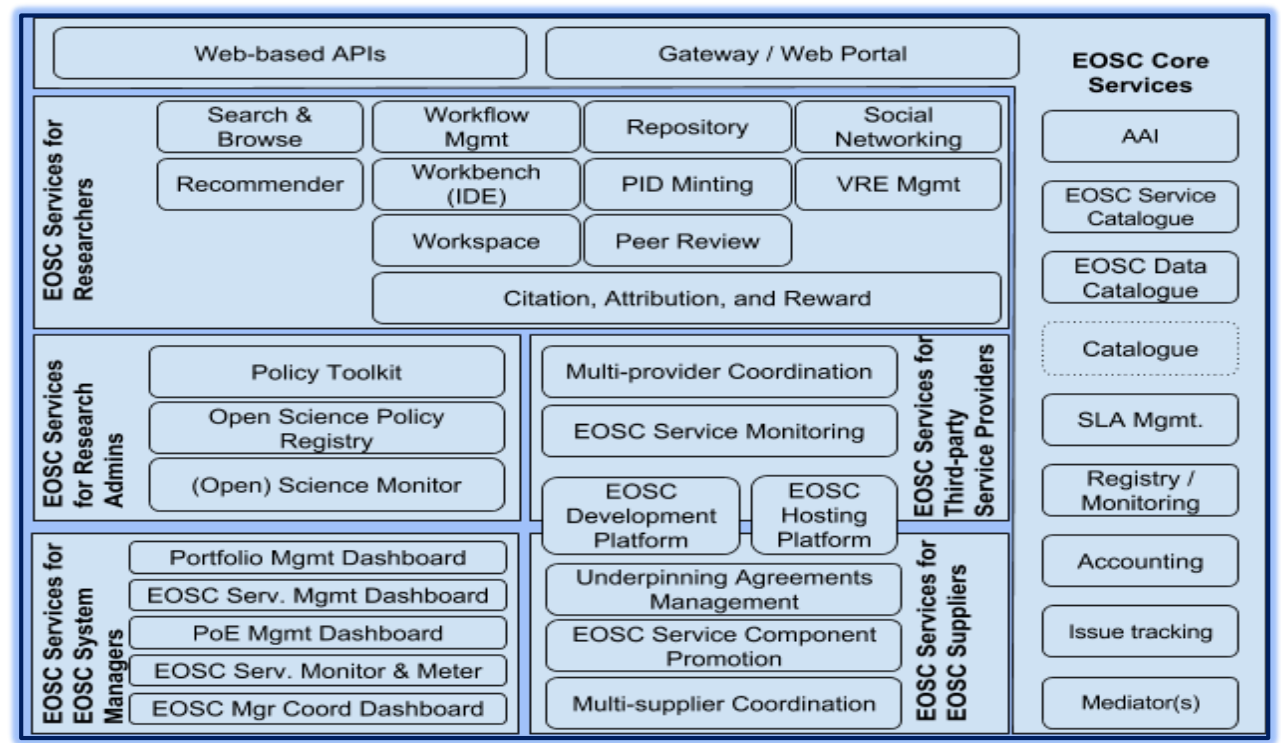
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Governance	IIT	ICAR	ISTI, IREA, IIT, ICAR



# ISTI- ARCHITECTURE (1)



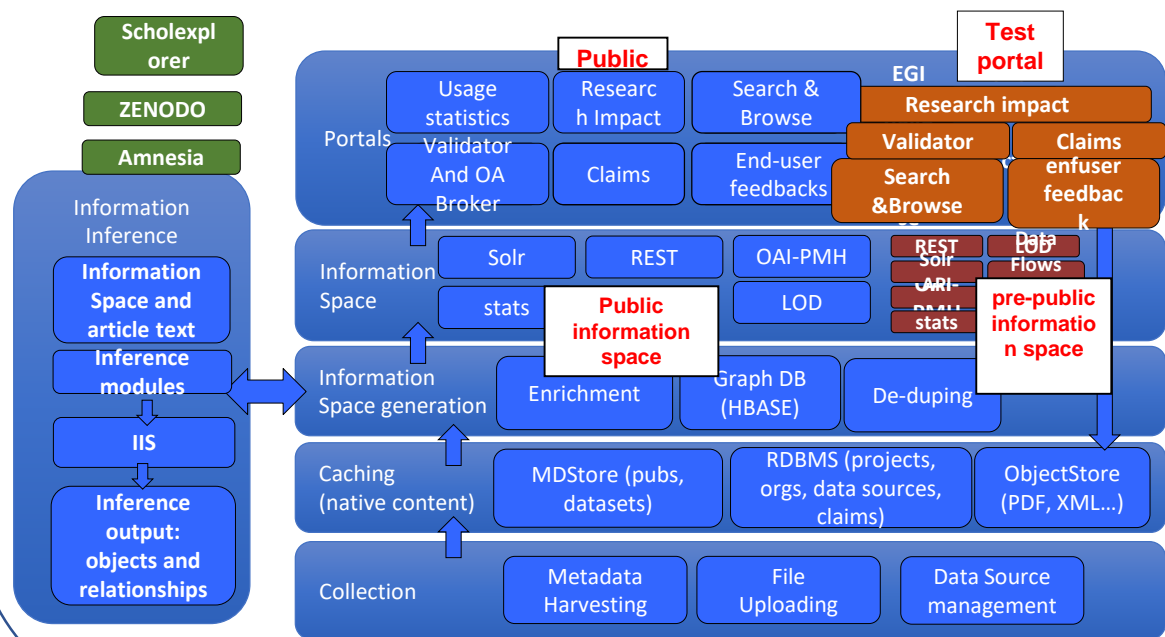
## **EOSC Architecture** (in the framework of the EOSCPilot Project)



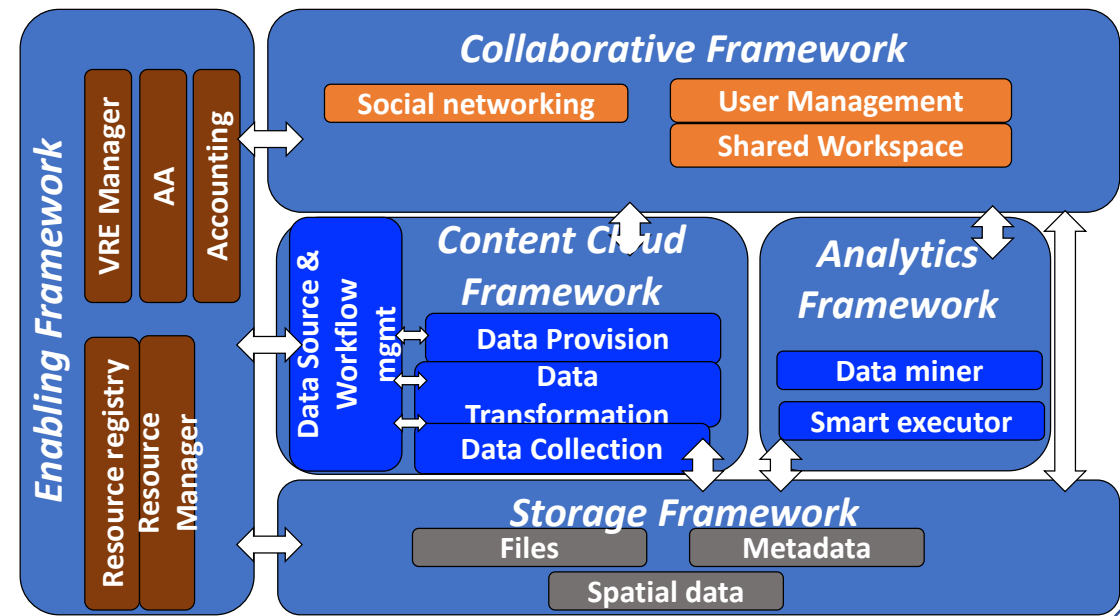
# ISTI- ARCHITECTURE (2)



- **D-Net system** supporting:
  - **OpenAIRE** (<https://www.openaire.eu/>)
  - **National repository aggregation systems:**  
La Recolecta (Spain), CEON (Poland), Turkey, Argentina, Ireland (ongoing)



- **gCube system** supporting:
  - **D4Science** (<https://www.d4science.eu/>)



# ACCESS & INTERFACE action line

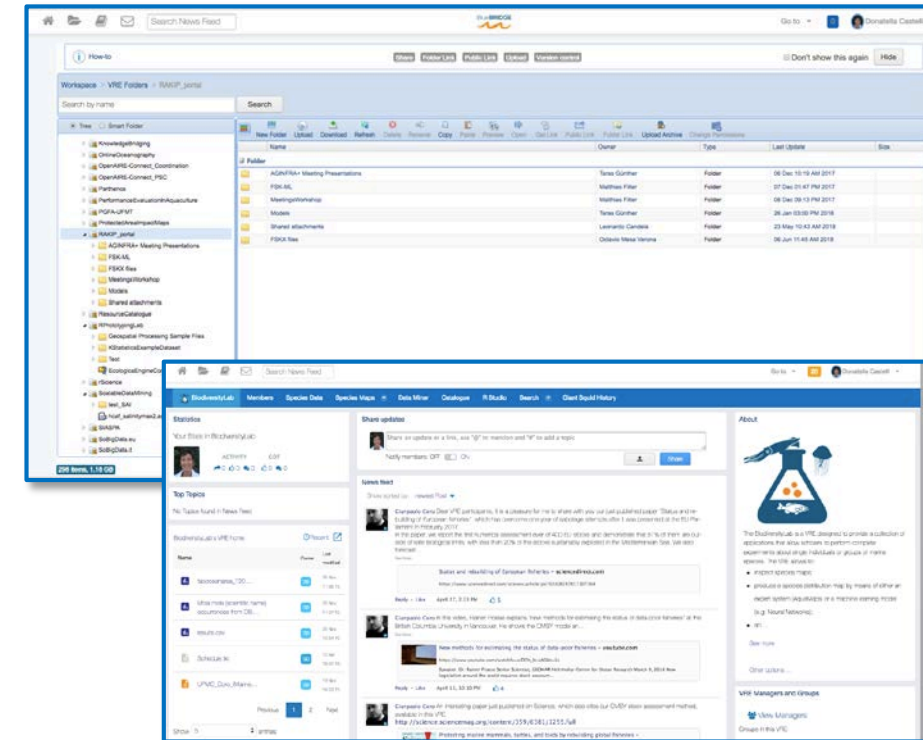
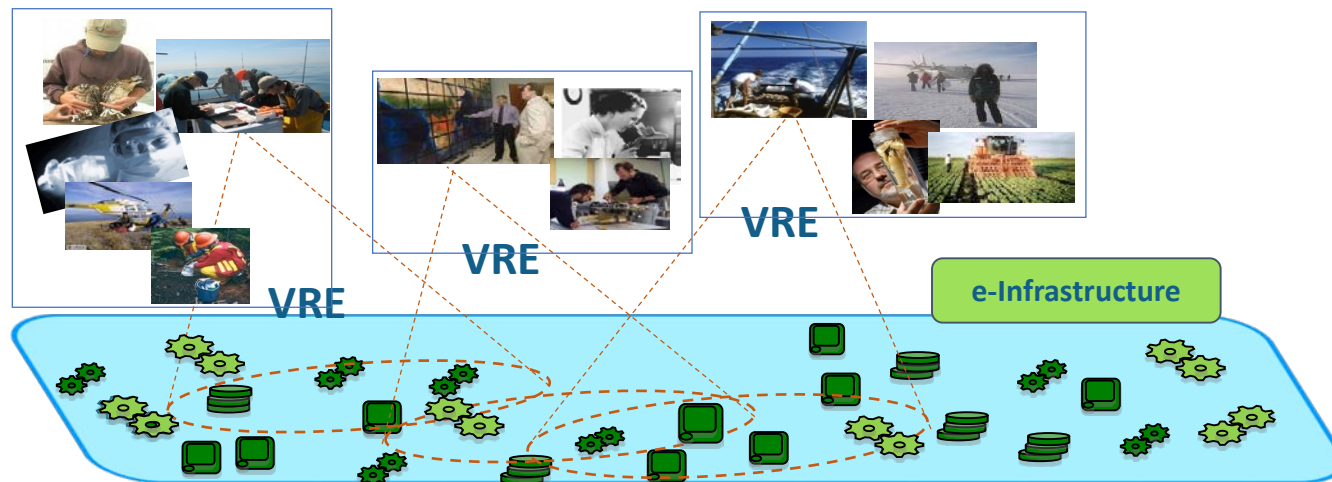
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# ISTI-ACCESS and INTERFACE

## *Virtual Research Environment as a Service*

- **e-Infrastructure enabled web-based working environment**
- providing access to services and resources tailored to serve the needs of a research team **in addressing a research question**
- **open and flexible** with respect to service offering and lifetime
- providing fine-grained **controlled sharing** of both intermediate and final research results
- supporting **cooperation and sharing**
- **low cost of creation and operation**





# NETWORK Infrastructure

	Network Infra	Computing Infra	Data Infra
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# IIT – NETWORK INFRASTRUCTURE & SERVICES

- Studies and development of innovative technological solutions for the realization of **complex Internet network** and **services infrastructures**
  - Great emphasis is given to deploy reliable, trustworthy, resilient and competitive systems
- **Promotion and transfer** of new network and service technologies to Italian Public Administration and to Italian and international enterprises
- Active participation to several national and international organizations and working groups aimed to the **standardization of new services and protocols** (ICANN, IETF, ccNSO, CENTR, RIPE-NCC, W3C, etc.)

# IIT – NETWORK Infrastructure: main initiatives



- **IP telephony**

- VoIP infrastructure of Tuscany Region



- Management of **distributed federated authentication and authorization infrastructure**

- EduRoam and IDEM in collaboration with GARR



Consiglio Nazionale  
delle Ricerche



- **Telematics network**

- Telematics network of CNR in Pisa
- Modernization of network infrastructure of Stato Maggiore della Difesa

- **Multimedia tools in support of scientific research**

- **Consortium GARR working groups**

- Diffusion of VoIP and IPv6 in Italian research and education institutions

- **IPv6 Italia chapter**

- Successful diffusion of IPv6 in Italy



REGIONE  
TOSCANA





# Fostering eInfrastructure coordination at National Level

## ICDI (Italian Computing and Data Infrastructure)

- Bottom up Forum created by representatives of major Italian Research Infrastructures and e-Infrastructures, with the aim of:
  - **promoting synergies at the national level**, and optimising the Italian participation to European and global challenges in the addressed fields
  - providing the national research community with opportunities to discuss, negotiate and put in place **common strategies for the participation in the EOSC and EDI**
  - ensuring a **coherent growth of national infrastructures**
  - **improve sustainability** by leveraging on existing human capitals, knowledges, experiences, etc.
  - fostering the **cross-fertilization of solutions** across multiple scientific domains
- Participants in the forum include ASI, Cineca, CNR, GARR, INAF, and INFN
- The AP is represented in this initiative by ISTI and IREA

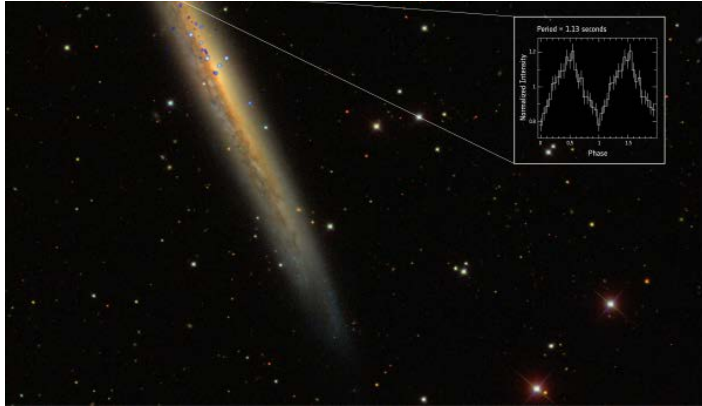


**Exemplification of  
outstanding infrastructures,  
infrastructure services and activities  
within the PA**

# IMATI - Examples



Exploring the X-ray Transient  
and variable Sky



The EXTraS portal supported the discovery of a pulsar – the spinning remains of a once-massive star – that is a thousand times brighter than previously thought possible.



DRIHM  
DISTRIBUTED RESEARCH INFRASTRUCTURE  
FOR HYDRO-METEOROLOGY

The following video describes the motivation and philosophy behind the DRIHM e-Infrastructure.

<https://vimeo.com/255001784>

REPORTS | ASTRONOMY

An accreting pulsar with extreme properties drives an ultraluminous x-ray source in NGC 5907

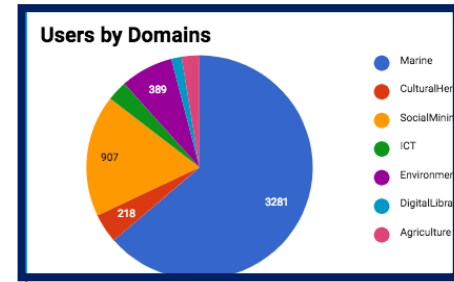
Gian Luca Israel<sup>1,\*</sup>, Andrea Belfiore<sup>2</sup>, Luigi Stella<sup>1</sup>, Paolo Esposito<sup>3,2</sup>, Piergiorgio Casella<sup>1</sup>, Andrea De Luca<sup>2,4</sup>, Martino Marelli<sup>2</sup>, Alessandro Papitto<sup>1</sup>, Matteo Perri<sup>5,1</sup>, Simonetta Puccetti<sup>5,1</sup>, Guillermo A. Rodríguez Castillo<sup>1</sup>, David Salvetti<sup>2</sup>, Andrea Tiengo<sup>6,2,4</sup>, Luca Zampieri<sup>7</sup>, Daniele D'Agostino<sup>8</sup>, Jochen Greiner<sup>9</sup>, Frank Haberl<sup>9</sup>, Giovanni Novara<sup>6,2</sup>, Ruben Salvaterra<sup>2</sup>, Roberto Turolla<sup>10</sup>, Mike Watson<sup>11</sup>, Joern Wilms<sup>12</sup>, Anna Wolter<sup>13</sup>



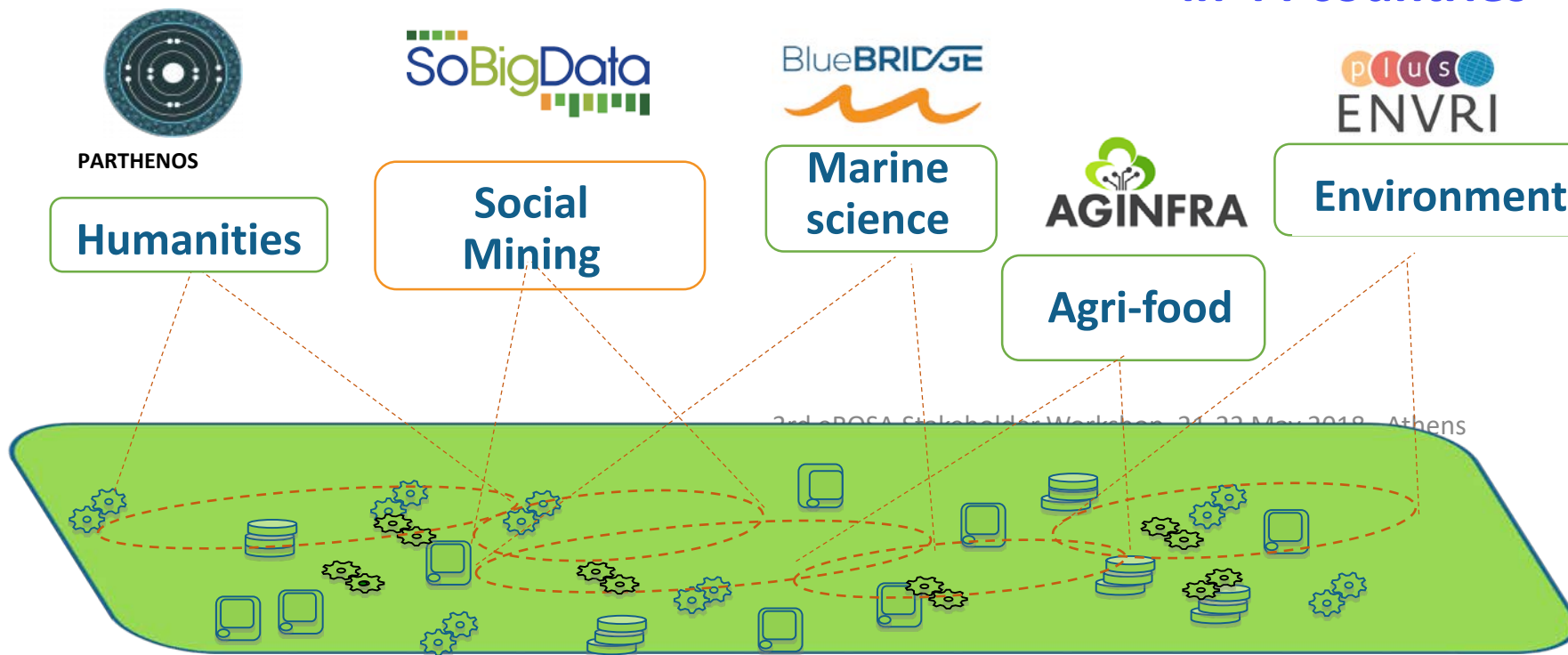


# ISTI-D4Science e-Infrastructure

Data infrastructure serving **scientific interdisciplinary & multifacets collaboration** along the **entire knowledge production workflow**



**5100+ users  
in 44 countries**



## Other supported projects and initiatives (July 2018)

- AgINFRA [plus.aginfra.eu/](http://plus.aginfra.eu/)
- ARIADNE [www.ariadne-infrastructure.eu/](http://www.ariadne-infrastructure.eu/)
- BlueBRIDGE [www.bluebridge-vres.eu](http://www.bluebridge-vres.eu)
- DEMETER <https://etn-demeter.eu/>
- DESCRAMBLE <http://www.descramble-h2020.eu/>
- ENVRIPlus [www.envriplus.eu/](http://www.envriplus.eu/)
- GEMex <http://www.gemex-h2020.eu/>
- iMarine <http://www.i-marine.eu/>
- OpenAIRE-Connect <http://www.openaire.eu/>
- PARTHENOS [www.parthenos-project.eu](http://www.parthenos-project.eu)
- PerformFish [performfish.eu](http://performfish.eu)
- SoBigData [sobigdata.eu](http://sobigdata.eu)
- .... and many others

<https://services.d4science.org/explore>



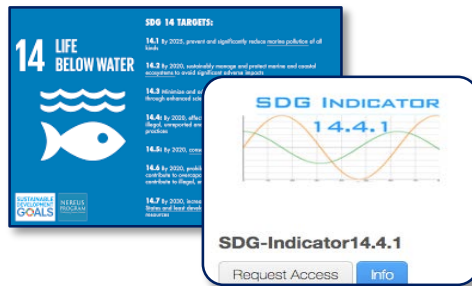
# ISTI-D4Science & its Virtual Research Environments: few examples



It supports the project «Strengthening national data collection and regional data sharing through FIRMS to support priority regional fishery management plans in the WECAFC area».



It provides tools to visualize, analyze and report on a range of ecologically important seafloor features within marine protected areas – thus contributing to Maritime Spatial Planning (MSP).  
[https://youtu.be/ZKq3UxNT4\\_0](https://youtu.be/ZKq3UxNT4_0)



It supports FAO training activities on "Best-practices for the implementation and reporting of SDG Indicator 14.4.1



It gives programmatic access to a set of widely worldwide used Entity Linking tools



Search facility enabling users to access elements from the Global Record of Stocks and Fisheries  
<https://www.youtube.com/watch?v=sHVoXPsqQm0>



It allows users to access and download risk assessment models produced by the food safety community, modules there of and related data in a harmonized file format.

- **129 VREs**
  - **55,000+ data analysis/month**
  - **99.8 % availability**
- <https://services.d4science.org/explore>

# ISTI- OpenAIRE eInfrastructure

## A major EOSC Pillar: Open Access Infrastructure for Research in Europe

[www.openaire.eu](http://www.openaire.eu)



Search across 24+M publications,  
700K datasets from 11.7K repositories and OA journals,  
39K sw



Register literature or data repository & OA journal & CRIS;  
Validate against OpenAIRE guidelines;  
-Subscribe to receive usage statistics

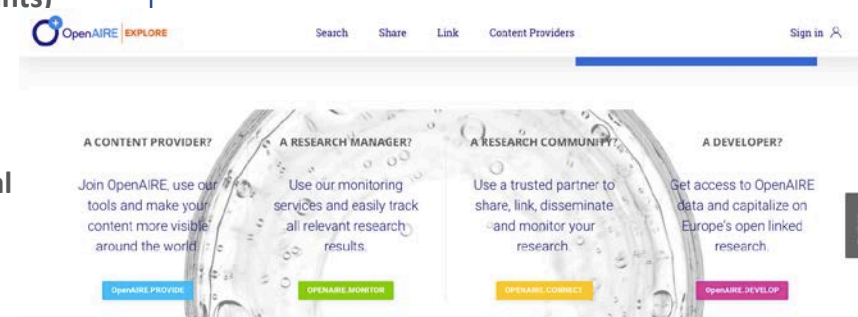
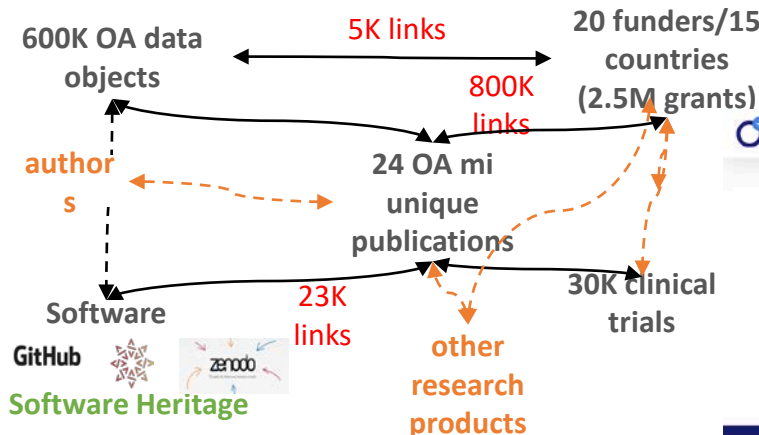


Research Community DashBoards



Tracking, reporting, monitoring for funders

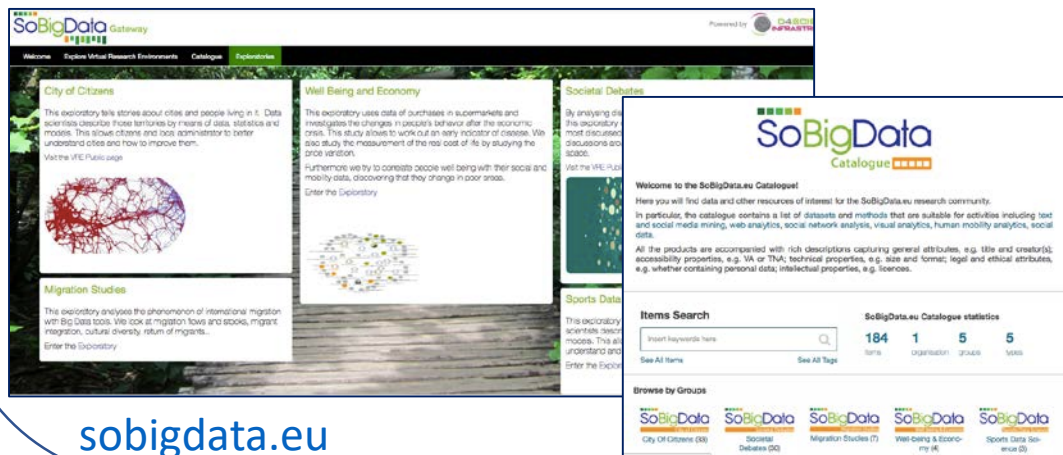
- Monitoring the **EU Commission Open Access mandate**
- Serving **researchers, funders, projects, repository administrators and research managers**
- **35 National Open Access Desks** (EU Members and Associated countries)



# Contribution to Research Infrastructures (ISTI)

## Virtual Access in SoBigData RESEARCH INFRASTRUCTURE

- **Exploratories:** answers to societal questions through data analysis
- **Catalogue:** data and other resources of interest for the SoBigData.eu research community.

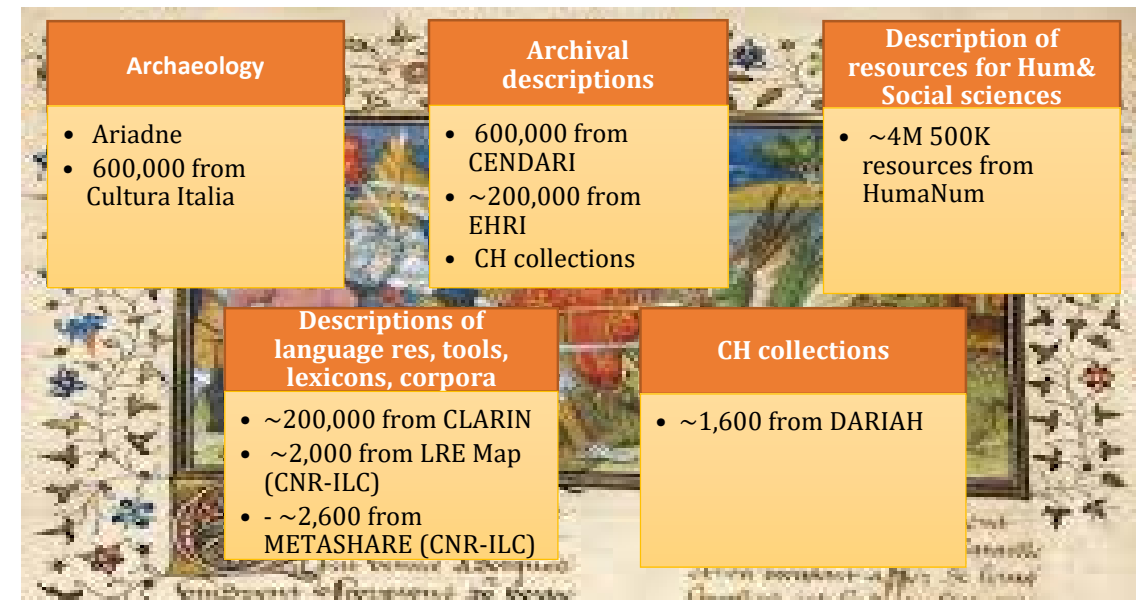


The screenshot displays the SoBigData Gateway website. On the left, there are several exploratory tool cards: 'City of Citizens', 'Well Being and Economy', 'Migration Studies', and 'Sports Data'. On the right, the 'SoBigData Catalogue' interface is shown, featuring a search bar, a list of items with statistics (184 items, 1 organization, 5 groups, 5 tags), and a 'Browse by Groups' section with icons for different categories like 'City Of Citizens (3)', 'Societal Debates (5)', 'Migration Studies (7)', 'Well being & Economic (6)', and 'Sports Data (2)'.

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

## Information Access in PARTHENOS

- Uniform semantic search across multiple heterogeneous sources



The infographic lists the following resources:

- Archaeology**
  - Ariadne
  - 600,000 from Cultura Italia
- Archival descriptions**
  - 600,000 from CENDARI
  - ~200,000 from EHRI
  - CH collections
- Description of resources for Hum& Social sciences**
  - ~4M 500K resources from HumaNum
- Descriptions of language res, tools, lexicons, corpora**
  - ~200,000 from CLARIN
  - ~2,000 from LRE Map (CNR-ILC)
  - ~2,600 from METASHARE (CNR-ILC)
- CH collections**
  - ~1,600 from DARIAH

<http://www.parthenos-project.eu/>





- **.it Registry**

- A very complex organization that assigns **.it domain names** to all the physical and juridical persons located in EU and SEE countries
  - It is open also to the Vatican State, San Marino Republic and Switzerland
- International service with a very complex architecture, both at network and services level
- It counts more than **3,100,000 domains** and, in terms of number of names, it is the 6<sup>th</sup> Registry at European level and the 11<sup>th</sup> at worldwide level
- **1,300+ service contracts** with Italian and International ISPs
- Organizational model which foresees a management committee, a steering committee, R&D, legal, external relations and operational units
- Network, systems, software and tools are run, managed and developed by IIT people

# Main Internet Services and Projects of IIT<sup>(1)</sup>

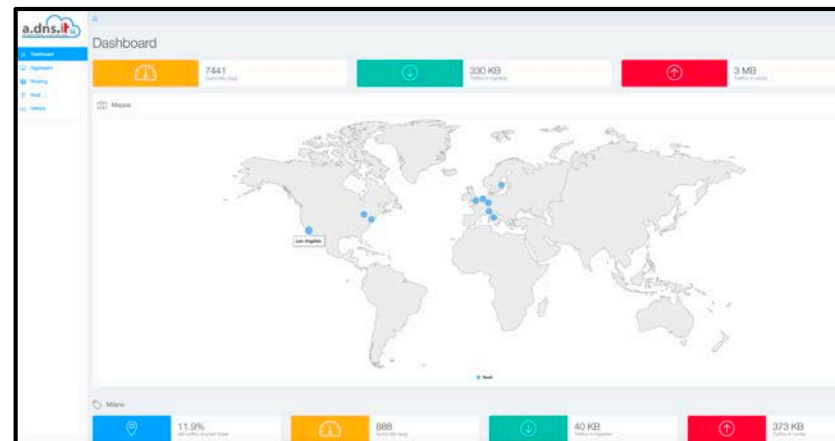


- **Study of the Internet diffusion and Digital Divide in Italy**

- Use of the “domain name” endogenous metric, a unique methodology at a European level
- Internet diffusion is analysed at a national, macro-area (North, Centre, and South), regional and provincial level

- **DNS anycast cloud**

- A DNS anycast cloud is being developed which counts more than 10 nodes distributed worldwide: Rome, Milan, Frankfurt, Amsterdam, London, Stochkolm, Toronto, New York, Los Angeles, Hong Kong, Sidney, San Paulo, Tokyo

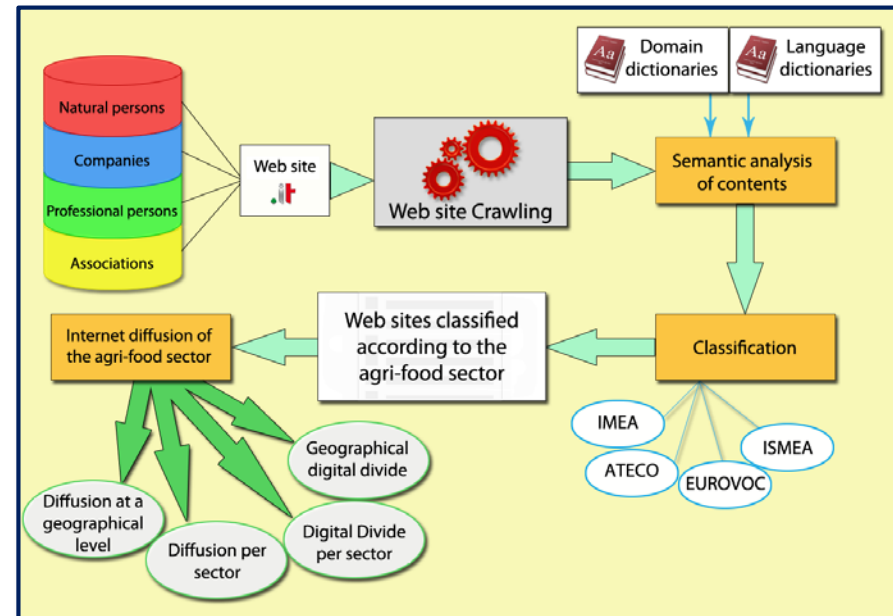




# Main Internet Services and Projects(2)

- **Agrifood, ICT and Tourism observatories**

- Real time analysis of the Agrifood, ICT and Tourism Internet diffusion
- “In house” development of a web crawling system and of a semantic engine for data analysis
- <http://www.foodinthenet.it> - <http://www.ictinthenet.it> - <http://www.tourisminthenet.it>



# Research Data Alliance

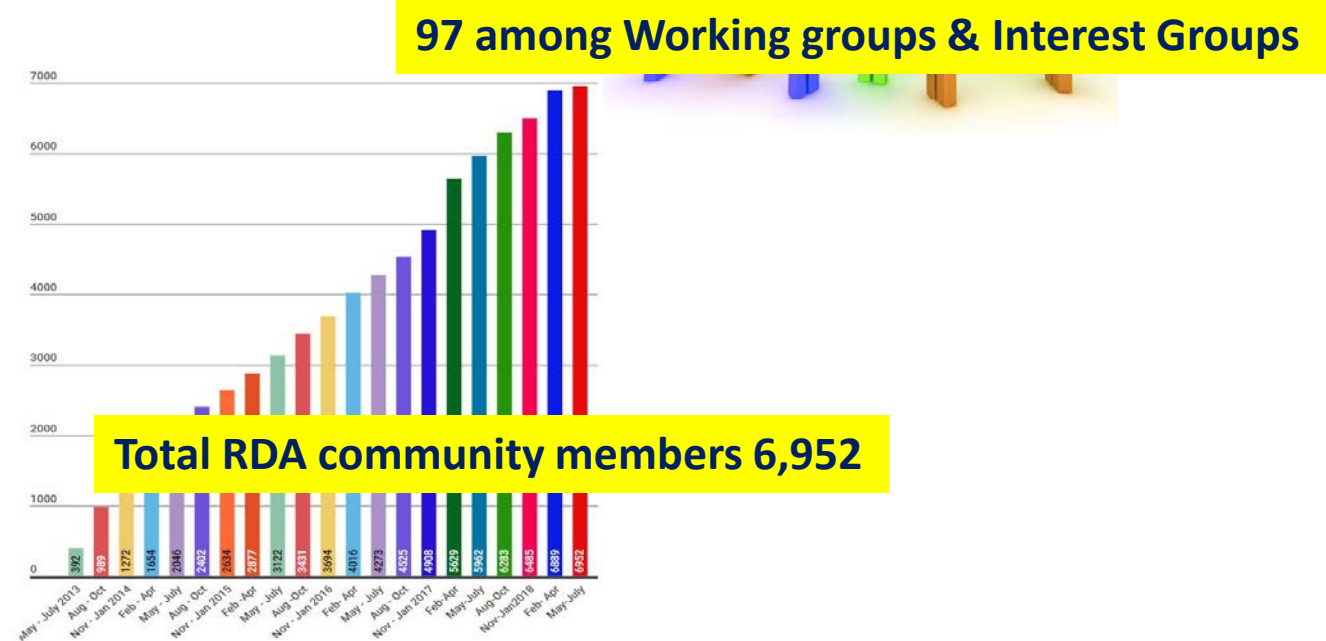
<https://www.rd-alliance.org/about-rda>

**International membership based organization** focused on the development of infrastructure and community activities that **reduce barriers to data sharing and exchange**, and the **acceleration of data driven innovation** worldwide

In the context of RDA-Europe CNR-ISTI hosts the **RDA Italian National Node**

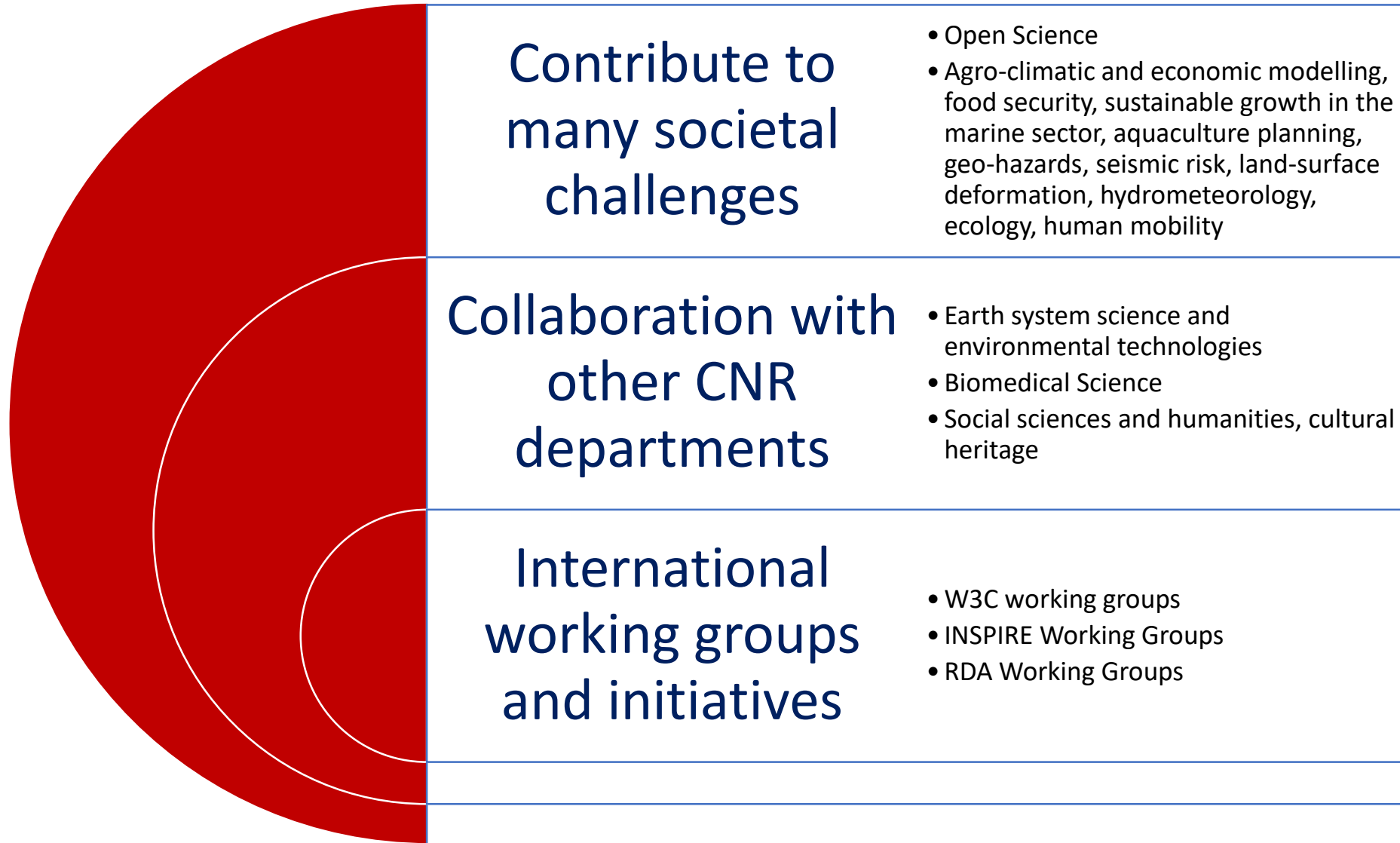
## Priorities:

- Research Infrastructures Coordination
- FAIR Data Management
- Data Management Plan





# Outside DIITET



# Results

## PROJECTS

- participation/coordination of 25 ongoing international/national projects

## FACILITIES

- more than 20 hw/sw facilities (clusters, servers, portals, platforms, FAIR enabling services, networking architectures and applications, inside and outside CNR)

## UNIQUE NATIONAL FACILITIES

- the .it Registry and the P-SBAS DInSAR Processing Chain (for Civil Protection)

## OPERATIONAL INFRASTRUCTURES

- operation and management of internationally recognized infrastructures, like D4Science and OpenAIRE

# Conclusions

- The e-Infrastructure Project Area works in **heterogeneous ICT research fields** and **application domains**
- General methods and solutions rise **from use-cases**, to be abstracted, exported and applied in more extended domain sectors and contributing to enacting **Open Science and Open Access**
- It results from the **effort of 83 researchers and technologists**
- It can offer valuable **expertise** for
  - designing and building Networking, Computation and Data infrastructure services tailored for public and private bodies,
  - as well as serve in consultancy, evaluation and promotion of initiatives in the field