



# MAGAZINE

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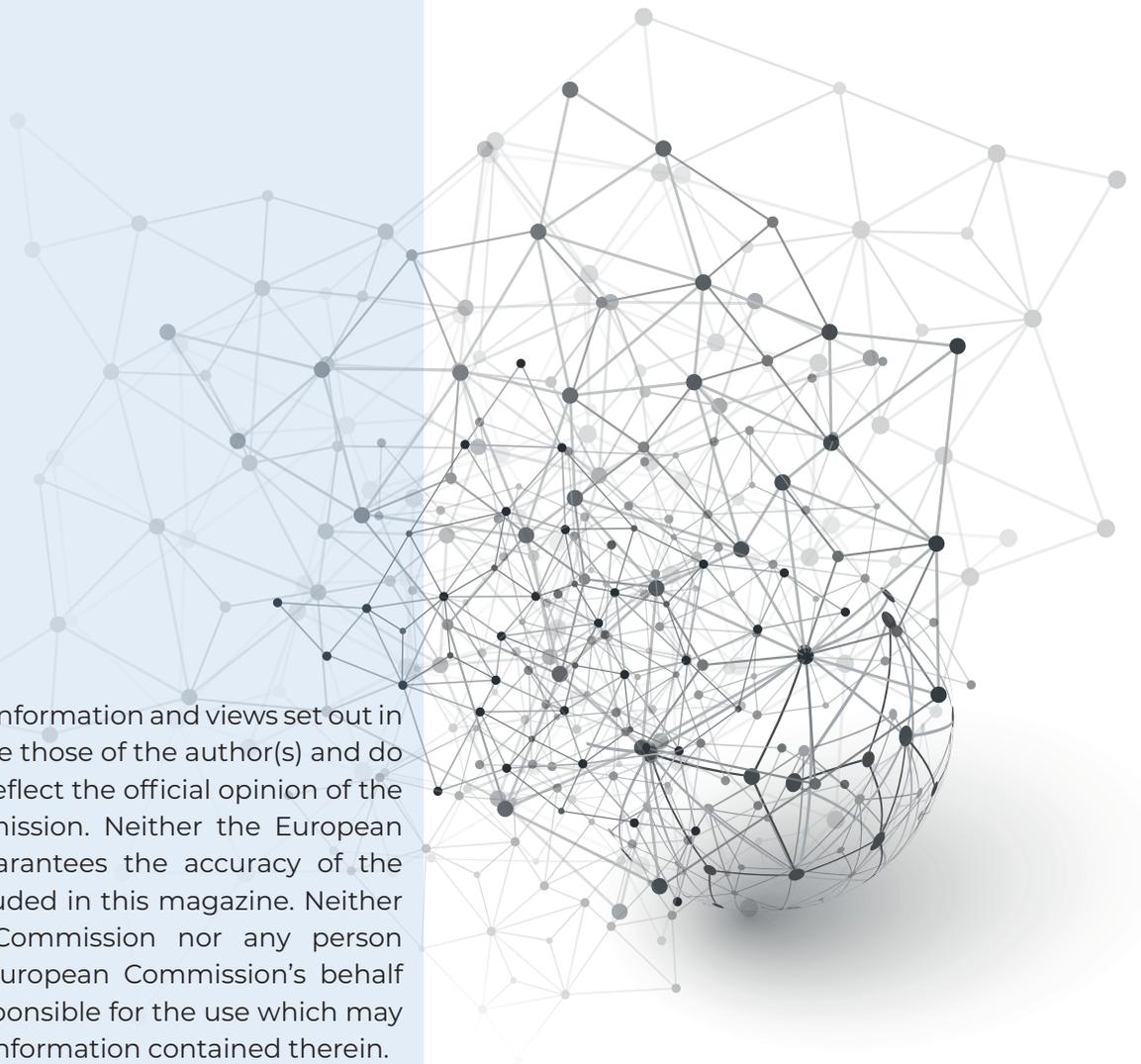
[eosc-hub.eu](http://eosc-hub.eu)



## EOSC-hub Magazine

The EOSC-hub Magazine is a publication of the EOSC-hub project, edited to showcase major results and achievements of the project, collaborations ongoing with other initiatives and updates from the communities. The magazine also provides an overview of the latest highlights from the European Open Science Cloud (EOSC) landscape.

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# About EOSC-hub

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**T**he EOSC-hub project brings together multiple service providers to create the Hub: a single contact point for European researchers and innovators to discover, access, use and reuse a broad spectrum of resources for advanced data-driven research.

For researchers, this will mean a broader access to services supporting their scientific discovery and collaboration across disciplinary and geographical boundaries.

The project mobilises providers from the EGI Federation, EUDAT CDI, INDIGO-DataCloud and other major European research infrastructures to deliver a common catalogue of research data, services and software for research.

EOSC-hub is funded by the European Union's Horizon 2020 research and innovation programme under grant agreement 777536.

Start: **January 2018**

End: **December 2020**

Total budget: **33 Million**

**75** Training Events

**48** Services offered

**100** Partners



# What is the Hub in EOSC-hub?

## *Tiziana Ferrari explains the vision behind the EOSC-hub project*

The EOSC-hub project was set up to create the Hub - an integration and management system of the future European Open Science Cloud. We see the Hub as an access and delivery channel for the services, software and data provided e-Infrastructures and research communities across Europe. The Hub will be grounded on mature processes, policies and federated tools.

At the first instance, the Hub will deliver the services and products provided by the EGI Federation, the EUDAT CDI and INDIGO-DataCloud. The catalogue of services and resources of the Hub will grow over time with the contribution of Research Infrastructures and communities from within and outside the project. The Hub is constructed to be open to all service and resource providers meeting a small set of requirements.

### **A Hub for researchers**

The Hub will offer the possibility to discover, compare, order, get access and support, and request additional services and products; all of this will be using own institutional credentials. This will include compute capabilities (e.g. High-Throughput Compute, Cloud), mechanisms to store and access data, tools to manage data. The Hub will also provide access to a broad spectrum of analytic tools (the Thematic Services) covering a wide range of sciences: Humanities, Engineering, Medical and Health Sciences and Natural Sciences. Sponsored access will be offered thanks to EC project funding and in-kind contributions of the participating providers. EOSC-hub through WP2 and WP12 will contribute to the definition and prototyping of an enhanced EOSC business model and procurement framework for its long-term sustainability.

### **A Hub for research communities**

The research communities that are driving the scientific progress in Europe (for example Research Infrastructures and large research collaborations)



can become Thematic Service providers and use the Hub to expose their service catalogues to their user communities. This will also give them the opportunity to expand their user base and build a stronger case for their sustainability.

### **A Hub for the EOSC**

The Hub will be the first European online platform to integrate services from major European e-Infrastructures and Research Infrastructures, as well as services from local, regional and national e-Infrastructures. This will be one of the steps that will bring us closer to the vision of a European Open Science Cloud.

Specifically, providers will be able to use the Hub as delivery channel that allows to manage the services and products according to policies and standards; promote them to a broader group of target groups through a Marketplace; manage orders and review service level agreements; support users through a shared helpdesk facility.

Tiziana Ferrari is the Project Coordinator of EOSC-hub and Technical Director of the EGI Foundation

 @tferrariEGI



# EOSC in practice – ENES

## *Sandro Fiore introduces the ENES Climate Analytics Service*

### **What are the main research goals of your community?**

The European Network for Earth System modelling, or ENES, brings together the scientific community working on these themes. ENES aims to: help in the development and evaluation of state-of-the-art climate and Earth system models, encourage exchanges of software and results, help in the development of high-performance computing facilities dedicated to long high-resolution, multi-model ensemble integrations.

### **Who is involved in ENES?**

ENES was launched in 2001 and the institutions involved in this network include university departments, research and computer centres, meteorological services and industrial partners. ENES engages in improving European competitiveness and expertise by continuously working on extending the network Europe-wide. This community is strongly involved in the assessments of the Intergovernmental Panel on Climate Change (IPCC) and provides the predictions EU mitigation and adaptation policies are elaborated on.

### **What are the services provided by ENES to this collaboration?**

The main service is the ENES Climate Analytics Service (ECAS) and a related user-oriented virtual research environment called “ECAS Lab”. ECASLab is a user-friendly, scientific data analysis environment that integrates data and analysis tools to support scientists in their daily research activities. The environment combines the features of ECAS with a large set of Python libraries for data manipulation, analysis, and visualization.

ECAS builds on the Ophidia big data analytics framework and is the main component of the ECASLab. It represents a complete software stack developed for the analysis of large multidimensional data (‘datacubes’) in several eScience domains (e.g. climate change).

### **What are the capabilities of the ECAS service?**

ECAS is one of the EOSC-Hub Thematic Services. It aims to address several challenges, by integrating a set of operational products that enable a paradigm shift for climate analytics.

ECAS aims to reduce the need for local data download, by relying on server-side and parallel processing, and to reduce the effort of maintaining client-side tools, by managing a set of aspects on the server side, thus easing the demand on the clients. ECAS also reduces the need for the user to orchestrate complex workflows, by taking advantage of the workflow capabilities to run very complex experiments and take the coordination burden off the users, providing an end-to-end workflow experience. This will encourage flexible and open data sharing according to the FAIR principles and will enable PID-based provenance support through the integration with specific services like **B2HANDLE**. And finally, ECAS aims to improve performance, by enabling users to more easily exploit high performance computation and big data management, through a High Performance Data Analytics approach.

The EOSC is being set up to be Europe’s virtual environment for all researchers to store, manage, analyse and re-use data for research, innovation and educational purposes.

### **How will you interact with this environment?**

I will take an active part in the process, due to my current involvement, as CMCC Foundation, in the EOSC-hub project. CMCC, jointly with DKRZ,

ECAS is currently offered by the sites at Euro-Mediterranean Center on Climate Change (CMCC) and the Deutsches Klimarechenzentrum (DKRZ). To access the ECAS service or to learn more about the different datasets available, please follow the instructions for registration and access at the two sites:

CMCC: <https://ophidialab.cmcc.it>

DKRZ: <https://ecaslabor.dkrz.de>





hosts two ECAS instances that are intended to serve the climate community, through the ECASLab virtual environment.

ECASLab will offer user interfaces, such as Jupyter, to make the execution of analytics experiments on large climate datasets straightforward and user-friendly. Besides scientific research, we'll also provide some free access resources for training activities and evaluation purposes. Training and dissemination actually represent two key elements to increase both the user base and the awareness in the community of the paradigm shift towards High Performance Data Analytics.

**What opportunities will the EOSC open for your community?**

EOSC will set the ground for an ambitious landscape fostering open (data-driven) science and open innovation across various domains. This will provide new opportunities for both the scientific research and the private sector,

directly affecting the citizens and the society in general. In particular, I see a great value in the long tail of research that could introduce new and unexplored market opportunities, across different sectors, in the climate services context. In terms of research, EOSC will make cross-domain fertilization a reality, providing an open science environment able to envisage new scientific frontiers and deal with the many challenges deriving from them.

**How do you imagine your field in ten years?**

Well, 10 years is a very long time from now! Yet, what looks intriguing to me is the role that (machine) learning will play in climate science and more in general in open science research, besides the already active part of simulation and data management. This will represent a great shift for scientific communities and, at the same time, a strong opportunity for EOSC in the long run to evolve towards next generation data science frontiers.



# Digitizing Industry through the European Open Science Cloud

## *Sy Holsinger writes about the EOSC-hub Digital Innovation Hub*

The EOSC-hub Digital Innovation Hub is a mechanism for private companies to collaborate with public sector institutions in order to access technical services, research data, and human capital.

There is a network of Digital Innovation Hubs in place across Europe, already supporting sectors such as manufacturing, internet of things, cybersecurity or cognitive computing. The EOSC-hub Digital Innovation Hub (DIH) will add to the network by bringing private companies into the European Open Science Cloud through concrete business cases.

The EOSC-hub DIH will add value in the following areas:

- Support entrepreneurship by providing access to e-infrastructure services and resources to accelerate market uptake and exploitation of results;
- Brokerage and innovation, connecting commercial innovators with scientific community and business experts in the e-Infrastructures domain;
- Improve industry products and services through development activities like piloting, prototyping, performance verification, product testing.

The EOSC-hub DIH builds on individual public e-Infrastructures business engagement programmes and outreach activities in place for several years. The added value brought through a joint effort is in packaging a wider variety of services and expertise into a more coherent offer that would otherwise have to be accessed individually or compiled on their own. Services available to industry include, but are not limited to, access to e-Infrastructure resources; wealth of data produced by the research community; expertise and support; coaching and training; and visibility on a European and international scale, amongst others.

There are already six active pilots involving a dozen individual companies already exploiting these services, and through the EOSC-hub DIH, they will develop innovative solutions and bring them to market in different domains such as sport and biomedicine, cybersecurity, and environment.

The EOSC-hub DIH is open for more collaborations, so if you are looking for new opportunities to advance your business, we invite you to contact us now to identify how you can become part of the European Open Science Cloud ([www.eosc-hub.eu/contact-us](http://www.eosc-hub.eu/contact-us)).

## *Business Pilots*



### **CyberHAB**

To demonstrate the technical and economic advantages of applying the management of harmful algae blooms, exploiting Data Cloud Services (DCS) to support the key processes required (data processing, modelling, integration of images).





## Sports Smart Video Analysis

To develop a mobile-friendly, Software as a Service platform, for data-driven video analysis and automatic processing of videos of training sessions. This web-based, cloud-hosted software platform will provide coaches, athletes and, sports professionals with a user-friendly and reliable tool to analyse performance.



## Bot Mitigation Engine

To create a solution for the business sector to secure online services from botnet attacks such as web scraping, online fraud, digital ad fraud and spam. It will be offered as Software as a Service and will behave as a filter between global networks and a client's online services independent of where they are running (on premises or in the cloud).



## ACTION Seaport

An advanced mobile-friendly platform aiming to be accurate, computationally efficient, scalable, reliable, and capable of serving simultaneously multiple Port Authorities, as well as coastguards and other maritime authorities, worldwide in decision support to improve safety, environmental and operational performance.



## Weather Data Services for the future DRACO Observatory

To develop a cloud super computational pilot framework for the future commercialisation of data from the DRACO observatory. The outcome will be a framework for the analysis, storage and distribution of the state-of-the-art space weather data.



## Furniture Enterprise Analytics - DataFurn

To design and deploy a furniture analytics Platform-as-a-Service that collects, analyses and visualises online content (from social media and blogs to online portals), detects product-related content, extracts relevant topics and features, monitors brand influence and customer interactions, and predicts furniture trends.



# EOSC-hub Service Catalogue

The EOSC-hub Service Catalogue comprises services provided by the EGI Federation and EUDAT CDI, and services developed during the INDIGO-DataCloud project. The catalogue also includes analytics tools and platforms provided by research communities and listed as Thematic Services.

The Service Catalogue is one of the pillars of the EOSC-hub project, which aims to simplify access to a broad portfolio of products, resources and services provided by the major pan-European and international organisations.

Under storage and data, the Service Catalogue now includes B2HANDLE, B2STAGE, B2SAFE, B2NOTE, B2SHARE and B2FIND, as well as EGI's DataHub and Online Storage. These services offer a wide set of capabilities, from data

annotation, distribution and storage as well as metadata-based data discovery.

Computing services in the catalogue include EGI Cloud Compute and Cloud Container, and EGI High-Throughput Compute. These services provide compute capabilities for researchers that need on-demand virtual machines or to analyse large data sets.

The catalogue also covers identity and security services such as B2ACCESS and EGI Check-in, as well as a diverse set of Thematic Services, for example the WeNMR suite for Structural Biology, the Component MetaData Infrastructure for Digital Humanities, or the ENES Climate Analytics Service.

The EOSC-hub Service Catalogue provides the first set of mature services to the future European Open Science Cloud.

## Storage & Data



## Thematic Services



## Identity & Security



## Compute



[eosc-hub.eu/catalogue](https://eosc-hub.eu/catalogue)



EOSC-hub is working on 5 collaboration agreements with OpenAIRE-Advance, GÉANT, EOSCpilot, eInfraCentral, and RDA Europe with the common objective to best support and facilitate science across Europe

### OpenAIRE-Advance

On April 2018 EOSC-hub and OpenAIRE signed a Collaboration Agreement to consolidate the projects' ambition for Europe to become a global leader in digital and open science to ensure that scientists reap the full benefits of open data-driven science. The areas covered by the collaboration are: Service Integration; Communication, Engagement, Support and Training; Governance and Strategy.



### GÉANT

The coordination of the EOSC-hub and GN4-2 service roadmaps and the management of the service portfolios of the two initiatives, including interoperability of federated AAI solutions, are at the core of the joint collaboration agreement between EOSC-hub and GN4-2.



### EOSCpilot

EOSC-hub and EOSC-pilot are working on the joint definition of approaches to federated service management, providing support to the public consultation on the Rules of Participation, continuing the work of EOSCpilot's science demonstrators in EOSC-hub's Competence Centres.



### eInfra Central

The definition of a Catalogue of Services for EOSC and the joint ongoing work for the creation of the EOSC portal are fundamental features of the eInfraCentral and EOSC-hub collaboration.



### RDA Europe

Research Data Repository interoperability and certification, Federated Identity Management, Metadata, PIDs, Sensitive Data are only few of the areas identified by the two initiatives to advance the open & interoperable sharing of research data in Europe contributing to the EU Open Science Strategy.



# The EOSC-hub week: a flurry of EOSC Energy

From the 16<sup>th</sup> to the 20<sup>th</sup> of April 2018, Malaga was the cradle of the first EOSC-hub week. The event, co-sponsored by the EGI Foundation, the EUDAT CDI and the XDC project, was the first of a series of annual meetings that the EOSC-hub project will organise to bring together service providers, representatives of research communities and policy makers to discuss and advance the establishment of the European Open Science Cloud (EOSC).



Around 170 stakeholders had the opportunity to hear about the results of the consultation process launched in April 2016 now captured in the Implementation Roadmap for the European Science Cloud from Augusto Burgueño Arjona, Head of the “eInfrastructure” Unit at the European Commission (DG CONNECT). The Implementation Roadmap was adopted on 14 March 2018 as part of the Staff Working document of the European Commission. Burgueño Arjona described the possible EOSC model as “a pan-European federation of data infrastructures built around a federating core and providing access to a wide range of publicly funded services supplied at national, regional and institutional levels, and to complementary commercial services”. He also highlighted the six actions lines, fundamental for the EOSC implementation, according to the staff document: (a) architecture, (b) data, (c) services, (d) access and interfaces, (e) rules and (f) governance. According to Burgueño Arjona, joining EOSC is a decision up to the stakeholders that are also free to decide about their level of participation.

The level or rules of participation is one of the focal topics under the radar of the 2nd High-Level Expert Group (HLEG) on EOSC. During

the EOSC-hub week, Isabel Campos, CSIC and member of the HLEG, highlighted a number of recommendations from the report and some of the “EOSC in practice” stories there collected. The interim report will be published on the 11th of June on the occasion of the EOSC Summit in Brussels. A public, on-line consultation platform will be launched at the summit to allow for a transparent feedback from the stakeholders willing to contribute to the building of a flexible and adaptable pan-European federation of data infrastructures.

The opening dedicated to the EOSC landscape set the scene for the Project Coordinator Tiziana Ferrari (EGI Technical Director), and for the Project Director, Per Öster (CSC Director) to showcase what the EOSC-hub project is doing to support and implement the EOSC vision. The major achievements highlighted by Ferrari and Öster were: the EOSC-hub service catalogue, the unique access point for all the EOSC horizontal and thematic services ([eosc-hub.eu/catalogue](http://eosc-hub.eu/catalogue)), the EOSC-hub marketplace, the gateway to procure the EOSC-hub resources (ready by the end of 2018) and the progresses on the collaboration with other H2020 implementation initiatives including: OpenAIRE-Advance, eInfraCentral, EOSCpilot, RDA-Europe 4 and several ESFRI projects.

The EOSC week continued with a set of sessions



## EOSC-hub week 2019

The next edition of the EOSC-hub week takes place in Spring 2019. Stay tuned to find out more information @EOSC\_eu



dedicated to hot-topics such as: how scientific communities can participate in the EOSC-hub and EOSCpilot projects; the rules to engage stakeholders in EOSC-hub; the role of the ESFRI projects in the EOSC-hub context; understanding the demand for digital services in research and

the role of public procurement and the initial EOSC-hub AAI architecture.

All the presentations and the outcomes of the sessions are available at [www.eosc-hub.eu/events/eosc-hub-week-16-20-april-2018-malaga-spain/programme](http://www.eosc-hub.eu/events/eosc-hub-week-16-20-april-2018-malaga-spain/programme).

### Insights from the organisers

The EOSC-hub week gave an excellent opportunity to keep abreast of the latest policy and strategic developments of the EOSC with insights from HLEG and EC presentations, and to learn from a large spectrum of projects and pan-European research infrastructures and e-Infrastructures about their concrete plans in advancing open science, improving research data sharing and its exploitation. I was impressed by the spirit of collaboration that transpired from the sessions.

*Tiziana Ferrari, EGI Foundation & EOSC-hub Project Coordinator*

The EOSC-Hub week was a unique opportunity to liaise with service and technology providers, research communities and policy makers. The session organised by XDC, jointly with EUDAT, DEEP-Hybrid-DataCloud and DARE, was both inspiring and fruitful from a technical point of view and engagement perspective. It was also key to identify common strategies, and resulted in the setting up of collaborations for the near future.

*Daniele Cesini, INFN & eXtreme-DataCloud project coordinator*

The EOSC-hub week was the perfect way to consolidate the collaboration between the core players of EOSC-hub showcasing the early achievements of the work done so far and to establish synergies with new initiatives. The event was also an important step towards the sustainability of EUDAT with the official appointment by the EUDAT CDI Council of the EUDAT Ltd. company as official host of the CDI and as representative of EUDAT in the European landscape.

*Damien LeCarpentier, CSC & EUDAT CDI*



# DI4R 2018 is heading for Portugal

*Registration and a Call for Abstracts are now open for the event in Lisbon (9-11 October)*

Building on the success of the 2016 event in Krakow and the last year's edition in Brussels, the Digital Infrastructures for Research conference (DI4R 2018) will bring Europe's e-Infrastructure community together with the theme 'Challenges for Research Communities around Open Science'.

The DI4R 2018 is jointly organised by EOSC-hub, GÉANT, OpenAIRE and PRACE and this year is hosted by LIP – the Portuguese Particle Physics Laboratory on the campus of the University of Lisbon.

Keeping with the tradition of inviting researchers to take the lead of the programme, DI4R 2018 will be chaired by two top members of the High-Energy Physics community: Sinéad Ryan, from Trinity College Dublin, and Volker Gülzow, from DESY.

"Digital infrastructures underpin research - enabling simulation, visualisation, storage and analysis and helping collaboration and innovation in an era of big data and large-scale

computation," says Professor Ryan. "The DI4R 2018 in Lisbon promises a lively and informative conference and a great opportunity to hear about new ideas that are allowing science to flourish."

"No Computing - No Science! DI4R discusses new technologies but more important is getting people together across disciplines and talk to each other during workshops or over coffee," says Professor Gülzow. "So take the opportunity and join us for a great event at DI4R 2018 in Lisbon!"

Registration is now open, and a Call for Abstracts is online until 29 June. The Programme Committee welcomes contributions for Lightning Talks, Presentations, Demos & Posters, Training Sessions and Interactive Sessions. DI4R 2018 will also have, for the first time, Provocations. Provocations are debates led either by a single speaker, or as a 'head-to-head', that is two co-speakers and a moderator, resulting in active participation of the audience and targeted feedback and ideas from an expert audience on a given topic.

## Programme Topic Areas

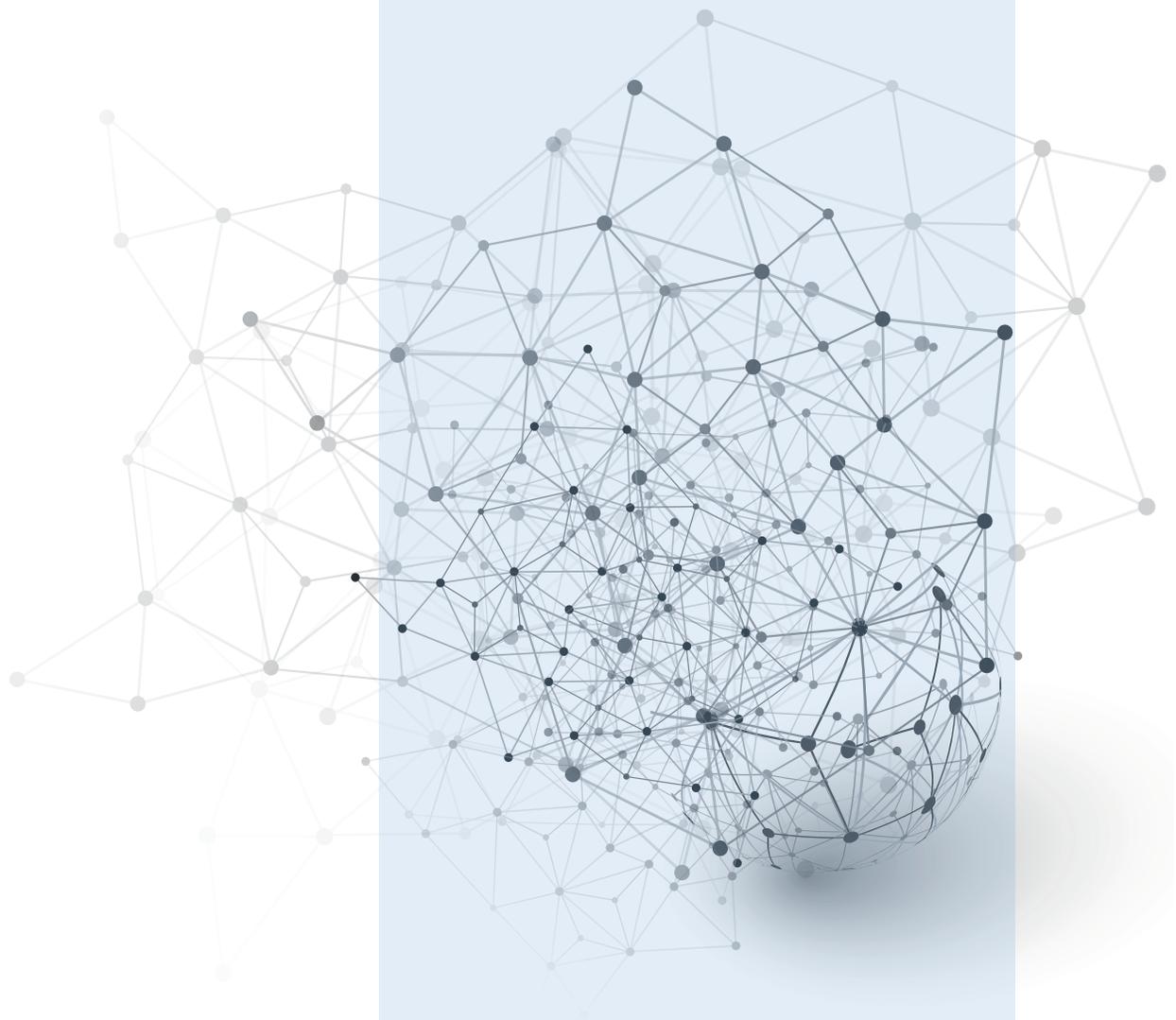
- Cross-domain data challenges
- Data science and skills
- Computing and Virtual Research Environments
- Security, trust and identity
- Digital Infrastructures for EOSC and/or EDI
- Business models, sustainability and policies
- Innovation in Open Science with SMEs and Industry

## Registration

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

Call for Abstracts, deadline  
**29 June 2018**







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