

The 12th National Information Day: Open Science, Open Data, Open Access, Bulgarian Open Science Cloud

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Abstract. The paper gives an overview the current landscape and the activities on national and institutional level regarding Open Science, Open Access to scientific information, Open Data and the overall development of the Bulgarian Open Science Cloud.

Keywords: Open Access, Access to Knowledge, Open Science, European Open Science Cloud, Bulgarian Open Science Cloud.

1 Introduction

The 12th National Information Day is devoted to the presentation of successful initiatives and projects for open access (OA), open data sharing and open science; strategies for promotion of OA; development of the Bulgarian Portal for Open Science and the national repository; development of the Bulgarian Open Science Cloud; copyright and licenses under OA; best practices and examples of policies for the development and promotion of open access at the national and institutional levels, etc. The event will support academic staff, research project managers, policy-makers and staff working in research funding bodies. It will demonstrate the main concepts for the implementation of OA principles and a national OA roadmap, key terms, strategies, business models, work plans, copyright and licenses, best practices, examples and policies for OA, open data and open science.

The European Open Science Cloud (EOSC) forms an ecosystem of research data and related services that enable and enhance access and reuse of FAIR research outputs. EOSC Future is one of the main H2020 funded projects that will steer the implementation of the EOSC Core development in collaboration with the other funded EOSC-related projects in the landscape (including the regional projects, the cluster projects,

FAIRsFAIR, the INFRAEOSC-07-2020 projects, OCRE, etc.). Bulgarian scientists are working in many areas of the EOSC.

2 Bulgaria OA Journals, Repositories and Portals

The total number of OA journals in Bulgaria (DOAJ: Directory of Open Access Journals) is presented in Figure 1. The license types are highlighted in Figure 2. The review types are shown in Figure 3.

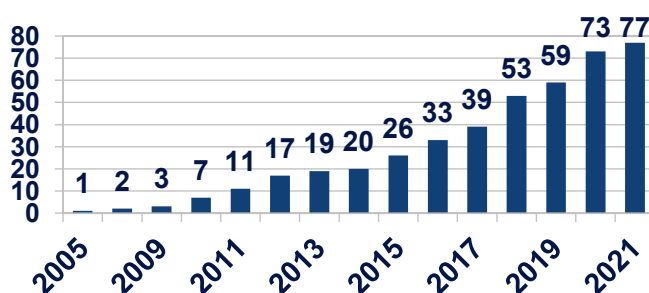


Fig. 1. Total number of open access journals in Bulgaria

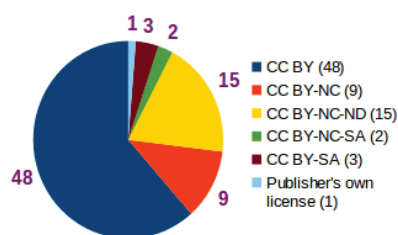


Fig. 2. License types of open access journals in Bulgaria

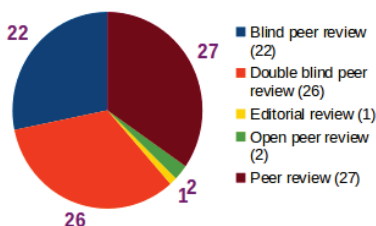


Fig. 3. Review types of open access journals in Bulgaria

Data for the Open Access Bulgarian repositories in 2021 are shown in Fig. 4.

Open Access Bulgarian Repositories 2020	Software	Link
New Bulgarian University Repository	EPrints 3.3.12	http://eprints.nbu.bg
BulDML at IMI-BAS	DSpace 1.6	http://sci-gems.math.bas.bg
Digital repository of Sofia University	DSpace 1.8.2	https://research.uni-sofia.bg
D.A.Tsenov Academy of Economics - Digital Library	DSpace 6.3-SNAPSHOT	http://dlib.uni-svishtov.bg/
Academic Research Repository at the Burgas Free University	Dspace 1.8.1	http://research.bfu.bg/
Central Medical Library - MU, Sofia	Dspace 6.3	http://cml.mu-sofia.bg:8080/jspui/community-list
Medical Academic Repository - Medical University - Varna Prof. Dr. Paraskev Stoyanov	Dspace 6.2	http://eprints.mu-varna.bg
BGOpenAIRE at IMI-BAS	DSpace 1.6.2	http://www.bg-openaire.eu
Bulgarian Portal for open science	Elastic	https://bpos.bg/

Fig. 4. Open Access Bulgarian repositories in 2021

The existing Bulgarian National (open datasets) Portals are:

- **Bulgarian portal for open science** (<https://bpos.bg/>). The national repository is multidisciplinary and welcomes research outputs from across all scientific fields.
- **Open Data portal** - (<https://data.egov.bg/>) Access to public open data sets in machine-readable format. It contains about 10 703 data sets from 533 organizations. This portal provides REST based API. Supported main formats for datasets are CSV, JSON, XML. The system is based on Elastic search engine. The following topics are included:
 - Agriculture, Fisheries, Forestry & Foods
 - Education, culture and sport
 - Environment
 - Energy
 - Transport
 - Science & Technology
 - Economy and finance
 - Population & Society
 - Government & Public Sector
 - Health
 - Regions & Cities
 - Justice, Legal System & Public Safety

- International Issues
- **National Statistical Institute** - (<https://www.nsi.bg>) like the Open Data Portal provides free and unrestricted access, but for selected data sets in machine-readable data formats in CSV, JSON.

3 The Main Open Science Activity in Bulgaria – 2020-2021

The National Priorities within the OS Initiative:

- Provide the necessary trusted infrastructure for long-term storage, sharing and access to scientific publications and other research results from publicly funded research.
- Foster new skills and competences.
- Raise awareness on Open Science and ensure the active involvement of researchers, universities and research organizations.
- Consolidate ambitions and planned actions in the National Open Science Plan.

National Policy and Infrastructure

Bulgaria has a National Open Science Plan since January 2021. The general ambition of the plan is to provide the research community and society with access to scientific publications and research data in an open and non-discriminatory way at the earliest stage possible and ensure the possibility for their use and re-use. The plan provides for the adaptation of the national policies, initiatives and research infrastructures with a view to integrating and creating conditions for inclusion and interoperability with the European Open Science Cloud. The plan provides for the following lines of action:

- **Coordination of policies**

This includes legislative amendments to set a clear commitment of the State to the Open Science initiative, adoption open access policies of RPOs and RFOs and to raise the awareness. Broad discussions with stakeholders and working groups and to ensure coordination of policies and actions on national and institutional level are planned.

- **Research data management in compliance with the FAIR principles**

The plan sets as a major milestone to upgrade and expand the capabilities for storage, processing and sharing of research data of the national repository, administered by the National Centre for Information and Documentation and implement internationally established standards and certificates of security and inter-operation of data. The plan also provides for the development of new tools and services, including creation of data management plans to support researchers in organizing their scientific information in line with the FAIR principles, the interoperability framework of EOSC.

- **Incentives**

Another major goal both nationally and within the universities and research organizations is to provide the necessary incentives and actively involve researchers in the development of the Open Science initiative. This is to be achieved by incorporating

new criteria related to Open Science in the research assessment process and adapting the funding system (guides, rules, grant agreements) to the new realities of Open Science. Also financial instruments are planned as to engage researchers and institutions in open science as a way to allocate funding.

- **Skills and competences**

Fostering new skills and competences among the research community is an action line of crucial significance to the success of the Open Science initiative. It involves a variety of activities including trainings, workshops and conferences for researchers, RPOs and RFOs, incorporate data management in the curriculum of Ph.D. students, etc.

Sustainable Development of the Open Science Initiative

Building a National Open Science Cloud Initiative (NOSCI) is a very important element of the OS sustainable development in each country. In Bulgaria the setting up of a NOSCI under the name *National Initiative for Open Data and Cloud Computing* is in progress. The founding members of the Bulgarian National Initiative are 9 research organizations: Institute of Information and Communication Technologies (IICT-BAS), Sofia University (SU), Institute of Mathematics and Informatics (IMI-BAS), Technical University – Sofia (TUS), Medical University – Sofia (MU), NIGGG-BAS, Institute of Mechanics (IMeh-BAS), Plovdiv University “Paisij Hilendarski”, University of Library Studies and Information Technologies. The initiative is open for new members.

The Memorandum of Understanding was presented and discussed on a dedicated meeting of these organizations held on 22 of July.

The main purpose the Bulgarian National Initiative is to provide faster and seamless sharing of publications, data and other digital research outputs and thus strengthen the communication and collaboration between scientists. The initiative aims to open opportunities for new levels of integration and raise awareness to facilitate a global, sustainable and cooperative Open Science.

The main priorities of the Bulgarian NI are:

- Engaging stakeholders at national level into EOSC
- Disseminating and promoting EOSC at national level
- Coordinating EOSC activities at national level
- Offering training on EOSC specific topics at national level

Training and Support

The National Centre for Information and Documentation, the Ministry of education and science undertook the task to raise awareness on Open Science and ensure the active involvement of researchers, universities and research organizations. Specific trainings on working with BPOS and the national repository were organized by NACID for more than 20 RPOs, including universities and institutes of the Bulgarian Academy of Science and the Agricultural Academy.

Series of events were held jointly by NACID and the Ministry of education and science, RPOs and infrastructures on the topic “Building a common vision towards Open Science”. The speakers presented the concept of open science, the advantages of

disseminating research, the features of open access publications and opportunities to optimize the research process thanks to the Bulgarian Open Science Portal and the national repository. The information and examples were tailored to the audience and practical examples were given. The events included fruitful discussions with the participants, answering all their questions related to the use of the portal and the benefits for scientists.

NACID revised and published new documents related to the work of the National repository, including a Long-term storage and preservation policy of the national repository, description of the Deposit process in the national repository, Deposited items lifecycle, a Deposit agreement, etc. (<https://bpos.bg/en/documents>).

The Institute of Information and Communication Technologies at BAS started organizing a series of Open Science capacity building events. First two training events were held in July and November 2020, next event is expected in October 2021. The main goal of these training events is to give an opportunity to the trainees to gain knowledge and skills about different aspects of EOSC, FAIR principles, OpenAIRE, NI4OS, certification and open research data management (ORDM).

Outreach and Dissemination

Bulgaria was invited by the EC to present BPOS and the National Open Science Plan at the 8th meeting Expert Group "National Points of Reference on Scientific Information" that took place March 17, 2021. The focus of the meeting was on challenges in research assessment and its link to open science.

NACID presented the Bulgarian portal for open science and the opportunities it presents to the research community at the Spring Science Session of the Faculty of mathematics and informatics at Sofia University held on March 27, 2021.

The NI4OS-Europe national dissemination event in Bulgaria was held on 20 November 2020 online with the aim to gather Open Science Cloud stakeholders in Bulgaria. During this event main Open Science initiatives were presented: EOSC, NI4OS-Europe, Bulgarian Open Science Portal, National Science Program for ICT, RDA.bg, OpenAir.bg, and an overview of the Bulgarian activities in this field.

A Documentary about open science policies in Bulgaria was released by the RDA BG Node (<https://www.youtube.com/watch?app=desktop&v=4HWsfZtQt7k>).

Task Forces

- Participating in the European Open Science Cloud – Steering Board;
- Sofia University became a member of the EOSC-Association <https://eosc.eu/members/sofia-university-st-kliment-ohridski>
- Participating in the Research Data Alliance;
- Participating in the National Initiatives for Open Science in Europe – NI4OS Europe (IICT-BAS and IMI-BAS);
- Participating in the OpenAIRE AMKE (IMI-BAS);
- Participation in EOSChub and EGI-ACE (IICT-BAS).

4 Discussion Topics during this Year National Information Day “Open Science, Open Data, Open Access, Bulgarian Open Science Cloud”

- Bulgarian roadmap for open science;
- European Open Science Cloud and EOSC Association;
- Bulgarian Open Science Cloud;
- National Science Program “ICT for science, education and security”;
- Bulgarian portal for open science and the national repository;
- Institutional repositories and other e-infrastructures;
- FAIR data requirements and tools;
- Open Data;
- Open Sources;
- Open Methodology;
- Open Peer Review;
- Open Access and Open licenses;
- Open Access Data E-Infrastructures;
- Access to Research Facilities;
- Access to Processing Capabilities;
- Communication at all Levels of Research Life Cruces;
- Open Access Indicators;
- Disseminate Partners’ Best Practices;
- Discuss Research Problems in the Field;
- Discuss the Possibilities of Establishing a Network of Open-Access Repositories;
- Contribute to the problems of the Harmonization of National Legislation and Practices.

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