
FOREWORD

The National Academy of Sciences of Ukraine is actively involved in building a national open science cloud as part of EOSC – the European Open Science Cloud. It comes to life, in particular, through the creation of its own research infrastructure based on open science, its integration into foreign repositories and search engines, and the introduction of appropriate conditions and motivations for the academic research community to rethink its approach to the organisation of scientific results research and presentation. This transformation is a necessary condition for Ukrainian science to join the ERA – the European Research Area, but it creates a whole range of problems and challenges.

This publication aims to familiarise the reader with the views of NASU scientists on the development of open science in Ukraine, the European Union, and the world, as well as the path taken by the National Academy of Sciences of Ukraine towards the introduction of European principles of open science, primarily open access to research results. The monograph was written by specialists from the Academy's scientific institutions who research open science issues and participated in the implementation of the Targeted Scientific and Technical Program “Creation and Implementation of Open Science Infrastructure at the NAS of Ukraine (OPENS)” (2023–2025).

The first chapter, “Conceptual Foundations for Implementing European Principles of Open Science,” presents a contemporary view of the background, current status, trends, problems, and implementation of the principles of open science, which have already gained worldwide recognition and become the basis for the global transformation of the scientific research process that we are witnessing. Particular attention is paid to the vision and experience of the National Academy of Sciences of Ukraine, as well as the prospects for the development of Ukrainian science in an open environment.

Chapter 2 of the monograph, “Legal Challenges of Open Science: European Union, Ukraine, the NAS of Ukraine,” highlights problematic issues of legal regulation of open science in the EU and Ukraine, as well as

the experience of regulating the application of open science principles at the National Academy of Sciences of Ukraine. It is emphasised that the system of acts of the NAS of Ukraine in the field of open science, decisions and recommendations on the use of open access licences, the use of official works, and the protection of restricted access information are important for the dissemination and practical use of scientific institutions and higher education institutions in Ukraine.

Chapter 3, “Open Research Data and the Implementation of FAIR Principles at the NAS of Ukraine,” focuses on the importance, conditions, and limitations of implementing open access principles in research data. The types and features of many open data repositories are considered, which helped to create the Repository of Open Research Data of the NAS of Ukraine and develop rules of use for scientists, scientific institutions, and higher education institutions.

Chapter 4, “Scientific data management ecosystem and the role of competence centres,” is devoted to the principles of forming a European system of competence centres for data management and applying their experience in the National Academy of Sciences of Ukraine. Competence centres are significant actors in the transformation of research practices, the digitisation of scientific institutions, and the implementation of strategies for the European integration of Ukrainian science. The book analyses foreign experience, in particular the system of Finland, which is effective in conditions of limited resources, and describes the principles and process of creating the Competence Centre for Open Science and Research Data Management of the NAS of Ukraine.

In the fifth chapter of the book, “Preprints and Preprint Archive of the NAS of Ukraine,” the basic principles of the functioning of the Preprint Archive of the NAS of Ukraine are described after a brief historical overview, a review of modern platforms, and an explanation of the importance of preprints as an essential component of scientific communication. The chapter is strongly focused on the practical aspects of user work and connection with other components of the Open Science Infrastructure of the NAS of Ukraine.

The sixth chapter, “Providing Access to Academic Publications: Repository of Scientific Texts of the National Academy of Sciences of Ukraine,” is devoted to a topic that is very important for scientists. It highlights the current role and capabilities of scientific libraries as aggregators of scientific texts, which provides accurate links between the profiles of scientific institutions and scientists with their manuscripts by using digital identifiers and bilingual metadata, integration of scientometric and other verified information, and various search functions.

The seventh chapter, “Opportunity for Growth: The Universal Publishing Platform for Journals of the NAS of Ukraine,” is devoted to this plat-

form as a strategic tool for transforming scientific communication. Increased requirements for the quality of editorial work, transparency of review procedures, and compliance with international standards of publication ethics have revealed a structural problem – the fragmentation and unevenness of editorial practices among the journals of the NAS of Ukraine. The development and implementation of the platform are taking place at the intersection of technological progress, open access policy, global requirements for scientific ethics, and academic integrity. At the same time, a set of challenges in the financial, legal, organisational and cultural spheres gets in the way of the platform development. This section examines the key barriers facing the initiative, as well as promising ways for its improvement.

Chapter 8, “Integration of Scientific Information Resources of the NAS of Ukraine,” describes in detail the Open Science Harvester of the NAS of Ukraine, which combines the roles of a hub for open scientific texts and data of the NAS of Ukraine and a gateway through which the collected information in the form of metadata is submitted to international search engines. As a hub, the Harvester brings together not only other components of the Open Science Infrastructure of the NAS of Ukraine, but also the scientific electronic libraries of NAS of Ukraine institutions, providing users with the ability to conveniently search for scientific information (articles, books, abstracts, illustrations, other video and audio content) from all integrated sources. The ease of automatic integration of additional sources of scientific information provides conditions for further expansion of its collection, and the consolidated presentation of scientific information from the NAS of Ukraine institutions in EOSC and other foreign search engines through Harvester will contribute to the popularisation of Ukrainian academic science, understanding its real level and overall impact.

The last, ninth chapter, “Main Portal and General Services of the Open Science Infrastructure of the NAS of Ukraine,” is devoted to the incorporation of the described subsystems into the one Open Science Infrastructure of the NAS of Ukraine at the software, technical, and information levels. The main open science portal serves as a web resource where all information on the state and development of open science in the world, in Ukraine, and at the NAS of Ukraine is collected and updated. At the same time, it acts as a “sole window” to access other components of the Open Science Infrastructure of the NAS of Ukraine, manage a scientist’s profile, and search for institutions and employees, etc.

Taken together, this allows us to make certain prognostic judgments and formulate tasks for the future, which is the subject of the monograph's conclusions.

That means, the monograph describes the bases for the formation of a modern model of open science at the NAS of Ukraine based on European

principles and models, with a view to developing a nationwide infrastructure that will be responsible for Ukrainian-speaking science and Ukrainian science in general within the EOSC.

Starting with the study of global experience, through the preparation and implementation of the necessary regulatory, organisational, and hardware and software decisions, the Presidium of the NAS of Ukraine, the Working Group on Open Science of the NAS of Ukraine appointed by it, and the institutions implementing the target project have arrived at a consolidated vision for the implementation of open science at the NAS of Ukraine, even with limited resources in wartime and post-war recovery conditions. We hope that our work will provide Ukrainian scientists with better opportunities to conduct research and present their results at the European level, promote the development of scientific communication in Ukraine and beyond, increase international scientific cooperation, make more effective use of research results, expand the participation of Ukrainian scientists in global collaboration, and promote Ukrainian science in the world.

President of the NAS of Ukraine
Academician Anatoliy ZAHORODNIY