

NEWS RELEASE

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NII and CERN Start Development of Next-Generation Repository System for Open Science Collaborating with NIMS

Japan's National Institute of Informatics (NII; Chiyoda-ku, Tokyo; Dr. Masaru KITSUREGAWA, Director General), one of four organizations that constitute the inter-university research institute corporation, the Research Organization of Information and Systems, started joint development of WEKO3 with the European Organization for Nuclear Research (CERN; Geneva, Switzerland) in October. WEKO3 aims to provide functionalities as a next-generation repository that plays an important role as a platform for universities and research institutions to make its research papers and data publicly available. Japan's National Institute for Materials Science (NIMS; Tsukuba, Ibaraki Prefecture; Kazuhito HASHIMOTO, President) is collaborating as a research institution in the joint development of this system for the era of open science. NII plans to carry out a feasibility study and pilot operation of WEKO3 from fiscal year 2018 followed by production-level operation through the repository cloud service JAIRO Cloud on WEKO3.

Background

Open science is a movement that aims to make research data, software, etc., in addition to research papers widely available via the Internet, and it is attracting attention as a new approach to conducting research. It has a strong advantage for improving the efficiency and productivity of research by reducing the duplication of experiments by making research data available for other research groups. Open science will also help to ensure the quality and transparency of research outputs. In addition, there is a potential to transform society's innovation system by opening up participation from industry and citizens into the scientific world.

In Japan, the Cabinet Office had an intensive discussion for promoting open science and publicized a report in March 2015.^(*1) In parallel with the Cabinet Office's Follow-Up Expert Panel on Open Science, the Science Information Committee, Science Subcommittee of the Council for Science and Technology, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) also had discussions on the promotion of openness of scientific output. In July of last year, the Science Council of Japan (SCJ) recommended "establishment of a research data infrastructure that allows the management of and ensures the openness of interdisciplinary research data."^(*2)

Open Science Initiatives by NII/NIMS

As an inter-university research institute, NII has supported the development and operation of institutional repositories to contribute to open access in Japan. An institutional repository is an important platform that enables universities and research institutions to manage, publish and disseminate their intellectual output publically. To intensify open access activity in Japan, NII began developing an institutional repository software called “WEKO” in 2008, and has made it available as an open source software. The advantage of WEKO is its intuitive user interface and high maintainability compared with existing repository software. Since 2012, NII has offered JAIRO Cloud, an institutional repository cloud service based on WEKO that is now used at more than 500 academic institutions in Japan. NII is continuously enhancing the functionality of WEKO based on feedback from the institutions using JAIRO Cloud. Based on these activities, NII received a Commendation of Merit in the Stanford Prize for Innovation in Research Libraries awarded by Stanford Libraries, USA, in March 2014.^(*3) On April 1 of this year, NII established the Research Center for Open Science and Data Platform (RCOS; Professor Kazutsuna YAMAJI, Center Director), with the primary mission of conducting research and development of new open science infrastructure in Japan.

As a Designated National Research and Development Agency, the mission of NIMS is to promote innovation in the field of materials, a sector in which Japan is strong. On April 1 of this year, NIMS established the Research and Services Division of Materials Data and Integrated System (MaDIS; NIMS Executive Vice President Yuko Nagano, Division Director), which aims to reform the way materials R&D is carried out and dramatically increase the speed of R&D by combining data science, computing science, theory and experiments, and is developing the world’s largest high-performance materials data platform. The materials data platform for open science will open up new avenues for creating knowledge, and as well as provide a platform for storing and publishing research results, will bring about innovation.

NII and NIMS signed a memorandum of understanding to promote coordination and cooperation as of June 1, 2017.^(*4) It aims to foster mutual contribution to the development of data platforms that will support appropriate management and publication of research outputs, and working together toward open science in Japan. At RCOS and MaDIS, both NII and NIMS are cooperating/collaborating to research and develop the technology required for a state-of-the-art data platform and establish advanced operating procedures.

New Software Development

At RCOS, NII is working to develop and operate three types of Information and Communication Technology (ICT) infrastructure—management, publication, and discovery platforms—to support research workflows at universities and research institutions. Among these three types of infrastructure, institutional repositories play a vital role as platforms for

publishing papers and research data.

In order to evolve WEKO as a platform for publishing different types of research outputs including research data, NII has started the development of WEKO3, a next-generation repository software for the era of open science based on the open-source repository software Invenio, developed by CERN. As well as being used in Zenodo, a data repository provided by CERN, and B2SHARE, a data-sharing platform offered by the European data infrastructure project EUDAT, Invenio is being used as a platform for promoting open access to research outputs in many academic institutions around the world. Using Invenio as a framework, NII will dramatically improve the functional extensibility and operational performance of WEKO3, and also enable it to handle large-scale data.

This new software development is being carried out under an international collaborative framework comprising NII, NIMS, and CERN. Some of the development results will feedback to the original Invenio in order to contribute to worldwide data repository communities. In Japan, NII and NIMS plan to enhance advanced features required by universities and research institutions by collaborating with the Japan Consortium for Open Access Repository (JPCOAR).^(*5) Through these collaboration, NII and NIMS will actively contribute to international open science activities.

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About the National Institute of Informatics (NII)

NII is Japan's only academic research institute dedicated to the new discipline of informatics. Its mission is to "create future value" in informatics. NII conducts both long-term basic research and practical research aimed at solving social problems in a wide range of informatics research fields—from fundamental theories to the latest topics, such as artificial intelligence, big data, the Internet of Things (IoT) and information security.

Also, as an inter-university research institute, NII builds and operates academic information infrastructure essential for the research and educational activities of the entire academic community, including the Science Information Network (SINET5), as well as developing services such as provision of academic content and service platforms.

About the National Institute for Materials Science (NIMS)

NIMS is Japan's only National Research and Development Agency specializing in materials science. It operates based on the philosophy of "materials research for society's needs," by taking a comprehensive overview of materials research required for the next generation. NIMS was founded in April 2001 by merging the National Research Institute for Metals and the National Institute for Research in Inorganic Materials, under the jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). By comprehensively managing and promoting basic research and development in materials science, NIMS aims to raise the level of areas of specialization in the field.

During its fourth medium- to long-term plan, which started in April 2016, NIMS intends to further strengthen its research capabilities and international competitiveness, and to contribute to society with a core goal of "accelerating the return of research results to society."

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(*1) A report about open science published by the Cabinet Office: Report by the Expert Panel on Open Science based on Global Perspectives(<http://www8.cao.go.jp/cstp/sonota/openscience/index.html>).

(*2) The Science Council of Japan (SCJ) recommended “establishment of a research data infrastructure that allows the management of and ensures the openness of interdisciplinary research data”: July 6, 2016, “Recommendations Concerning an Approach to Open Science That Will Contribute to Open Innovation,” Committee of Open Science, SCJ (<http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-23-t230-en.pdf>).

(*3) Received a Commendation of Merit in the Stanford Prize for Innovation in Research Libraries: See Stanford Libraries official website “2014 Prizes” (<http://library.stanford.edu/projects/stanford-prize-innovation-research-libraries-spir1/2014-prizes>).

(*4) NII and NIMS signed a memorandum of understanding to promote coordination and cooperation: See News Release on June 1, 2017, “NII and NIMS Sign a Memorandum of Understanding on Coordination and Cooperation/Promoting Open Science through Collaborative Data Platform Research and Development” (<http://www.nii.ac.jp/en/news/2017/newsrelease20170601-e.pdf>).

(*5) Japan Consortium for Open Access Repository: Established in July 2016 under a cooperation agreement between the Japanese Coordinating Committee for University Libraries and NII, with the aim of promoting and supporting institutional repositories in Japan. Abbreviated to JPCOAR. A base for Japanese universities and research institutions to work together on problem-solving aimed at developing their institutional repositories.