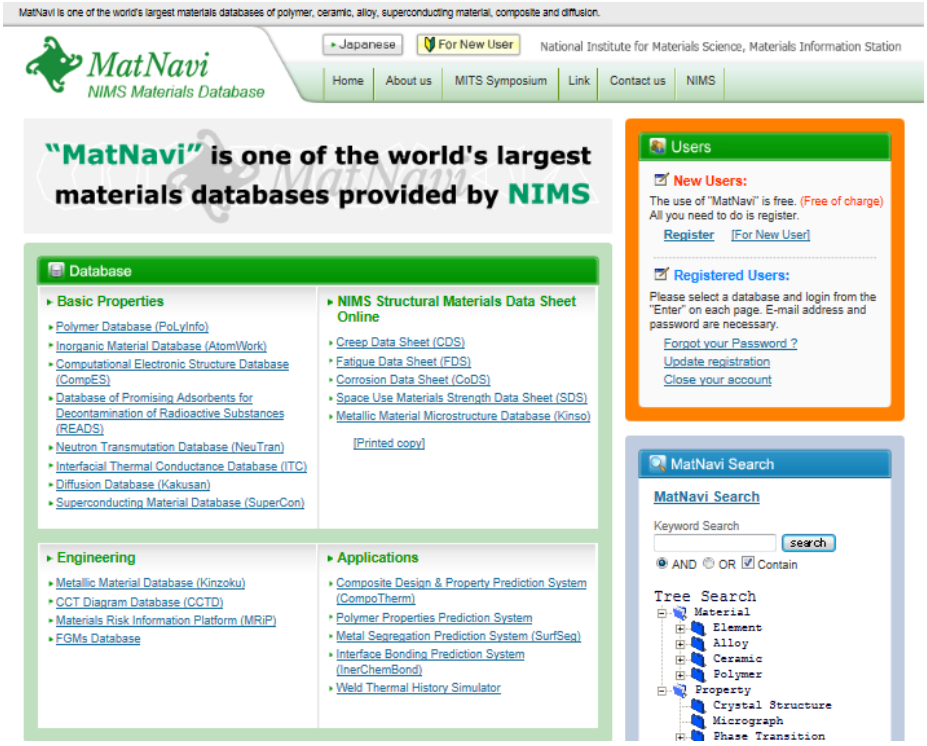
(c) Material science (nanotechnology)

In the field of material science, the National Institute for Materials Science (NIMS) has maintained a database (MatNavi) of physical and material properties since April 2015. This database stores items such as structural material database based on data sheets on creep (a phenomenon in which the distortion exhibited by a material subject to a continuously applied stress increases with time) and fatigue (a phenomenon in which the strength and other mechanical properties of a material subject to a continuous or repetitive mechanical stress degrade over time). The database also stores useful numerical data extracted from publicly released academic papers. The database consists of multiple interlinked databases storing information on subjects such as polymers, inorganic materials, metallic materials, diffusion, and superconducting materials. In addition to providing useful information for tasks such as material development, optimal use of materials, and optimal selection of materials, the database also aspires to be useful for predicting the properties of materials, comparing the properties of materials, and identifying materials (i.e., offering dictionary-like functionality). It is increasingly recognized that promoting the cause of open science in this field will require not only international collaboration, but also an awareness of the extremely important role played by materials informatics. It would therefore be desirable to build platforms tied to international standardization.



(d) Physics

Because differences exist between the values held to be important in different fields of physics, the status of open science initiatives in physics is not necessarily uniform.

One important project is the arXiv.org preprint archive, which, thanks to international collaboration, primarily from the physics community, since its launch in 1991, has developed into an important repository for the public release of research resources. This service is responsible for communicating the newest research information—prior to publication in peer-reviewed journals—in fields such as physics, mathematics, computational science, quantitative biology, quantitative economics, and statistics. The site now stores a total of over 1 million papers in its various research fields, all of which

are available for free download. At present, the arXiv is operated and maintained at the Cornell University Library by a team of international collaborators, and mirror sites are maintained in the Yukawa Institute for Theoretical Physics at Kyoto University. When using a repository of this sort, database search systems are extremely important. Inspire is a service of this sort operating in the field of physics that focuses on particle physics, nuclear physics, and cosmology. Inspire is the successor to an earlier service known as Spires, which was developed in 1969 at the Stanford Linear Accelerator Center. It is administered and operated by a network of major laboratories around the world, including Japan's KEK High Energy Accelerator Research Organization. Inspire is connected to major publishing companies, databases, and preprint archives around the world; the fact that it collects bibliographic information, references, and citations makes it particularly useful.

In high-energy physics and certain other fields, international research collaborations are the norm for large-scale experimental projects, and various international experimental collaborations have created databases located at major research institutions in which experimental results and data are stored and released to the public. The canonical example is the international collaborative project known as the Particle Data Group, which features over 200 researchers from some 24 nations. This group provides an annual review that is published in major academic journals and receives over 5,000 annual citations. This project began in 1957, and Japanese researchers have participated in it since the 1970s. Today, Japanese scientists are among the most active members of the collaboration. Mirror sites for particle databases are located at the KEK High Energy Accelerator Research Organization in Japan. Thus, the universal and international character of scientific research naturally tends to strengthen the international collaborative research aspects of open science.

Appendix 2. Developments in foreign countries

In many foreign countries, discussions of initiatives to encourage openness have been proceeding at an accelerated pace, primarily at international institutions and agencies responsible for the distribution of research funds.

Developments in Foreign Countries

In recent years, several foreign countries have developed a strong awareness of the concept of *open science*: a notion of openness in which the goal is to encourage sharing and inter-use of research results and data.
→ **This paradigm includes the concepts of open access (OA) and open data (OD), which are the wellsprings of new innovation.**

The accelerating pace of discussions regarding open availability of research results and data

1. Discussions are taking place at international meetings such as the G8 and at international institutions such as the Organisation for Economic Co-operation and Development (OECD).
2. Agencies responsible for the distribution of research funds in many foreign countries are pushing to ensure open access to the results of research conducted using public funds.
3. Many researchers participate in discussions of OA and OD at international organizations (such as the World Data System [WDS] and Research Data Alliance [RDA]).
4. Discussions of open science including the concept of citizen science and citizens as stakeholders.
5. Expectations of new innovations and new industries.

(A) OECD

In 2004, the science ministers of all member nations in the OECD—an organization of advanced nations—signed a statement calling for archival data arising from public investments to be made publicly accessible. After receiving requests from data-providing institutions in member nations and conducting a concentrated discussion, the OECD released the OECD Principles and Guidelines for Access to Research Data from Public Funding as a soft-law recommendation in 2004. In addition, the OECD has conducted a study of open science, and the results of this study, together with open science initiatives in various nations, are scheduled to be announced in 2015.

(B) Joint statement at a June 12, 2013 meeting of G8 science ministers

- The ministers agreed to cooperate to achieve even greater open access to peer-reviewed, published scientific research products and open data in scientific research fields.

- The ministers committed to greater openness for scientific research data for several reasons: to accelerate the process of scientific discovery; to create innovations; to ensure the practical utility of the results of scientific research; to ensure that such results are widely available; to facilitate the transparency of science; and to stimulate the participation of the national populace in the scientific process.

（G8-GSO-DATA WG）

The DATA WG, which addresses the topic of *global research infrastructure*, discusses issues associated with open access and research data sharing. This group is led primarily by the U.S., Europe, and Australia. At the December 2013 meeting of the DATA WG, after discussions regarding a number of points, the following agreements were reached:

1. Open access to research data should coexist with open access to published results to increase efficiency.
2. Open access and sharing of research data are essential for solving global problems.
3. The open release of research data is essential for validating the correctness of published results.

(C) GRC (Global Research Council)

The GRC is a forum comprising leaders of academic support institutions worldwide. Led by the U.S. National Science Foundation (NSF), it was established in May 2012 with the participation of Japan's JSPS and JST. At the second meeting of the council in May 2013, an action plan was adopted for ensuring open access to published results prepared using public funds. In 2015, Japan's JSPS rose to the rank of co-chair (a position shared with South Africa).

(D) International organizations that promote openness

(i) RDA (Research Data Alliance)
An international organization formed in August 2012 with funding from the U.S. NSF, the European Union's iCORDI, and Australia's ANDS. The organization is led by researchers, and seeks to establish rules for the sharing of research data.

(ii) RDA–C (Research Data Alliance Colloquium)
A collection of organizations, consisting primarily of funding institutions that disburse government funds, that oversees and supports the ongoing activities of the RDA. Whereas the RDA discusses the *how-to* of creating platforms for the global sharing of research data, the RDA-C was established as a forum for discussing the *what-to*.

(iii) ICSU-WDS (World Data System)
A committee formed in October 2008 at a general meeting of the ICSU (see below) that seeks greater sophistication of international initiatives related to scientific data (databases). Its international program office is hosted in Japan by the National Institute of Information and Communications Technology (NICT).

ICSU:
A non-governmental organization founded in 1931 with the purpose of promoting international activity in science and its fields of application. Headquartered in Paris, ICSU membership includes 31 international academic societies and more than 120 National Academies of Science. From Japan, the Science Council of Japan is a member organization. The primary

purposes of the ICSU include promoting collaboration among international academic organizations, primarily in the natural sciences, and planning efforts to harmonize international science-related activities.

(iv) CODATA (Committee on Data for Science and Technology)

A permanent committee established within the ICSU in 1966 with the goal of improving the management, reliability, and use of data related to science and technology, premised on the notion that such improvements will enhance the societal benefit of science and technology. From Japan, the Science Council of Japan has been a member since the founding of the Committee.

(v) Force11 (The Future of Research Communications and e-Scholarship)

A community of researchers, librarians, archivists, publishers, and supporting institutions.
Formulated "The Amsterdam Manifesto on Data Citation Principles" in 2011.

(vi) EIFL (Electronic Information for Libraries)

A non-profit organization established in 1999 to improve access to information via libraries in developing nations. The organization releases statements regarding open access policies and the introduction of mandatory open access. EIFL cites 77 partner organizations that adopt its policies and guidelines.

EIFL activities

At present, the EIFL has offices in the Netherlands and Italy, and is active in over 60 developing countries in Africa, Asia, Europe, and Latin America. For many years, the organization has collaborated with a variety of partner organizations to ensure the fulfillment of its mission. Examples of partner institutions include the IFLA, UNESCO, WIPO, and SPARC Europe.

(E) The situation in foreign countries

(i) U.S.

(a) The OSTP Directive (February 22, 2013)

The OSTP Directive for Open Access to Publicly-Funded Research in articles and research data was directed to all government agencies from the White House Office of Science and Technology Policy. Research-support agencies overseeing research and development funds in excess of 100 million dollars were required by the end of August 2013 to enact Plans for Expanded Access to Articles and Scientific Data, which were to be submitted to OSTP. Based on this directive, public access plans were prepared by government agencies such as the U.S. Department of Agriculture (USDA), the Department of Defense (DOD), the Department of Energy (DOE), the Department of Health and Human Services (HHS), the National Air and Space Administration (NASA), the National Institutes of Health (NIH), and the National Science Foundation (NSF).

(b) Initiatives at the National Institutes of Health (NIH)

- The NIH Data Sharing Policy was established in October 2003
- Called for the sharing of data resulting from NIH-funded research, including basic research, clinical research, and surveys
- Applicants for NIH funding were required to prepare a mandatory "Data Sharing Plan"
- In January 2008, the NIH Guide Notice for Public Access was established. In February 2015, following an OSTP directive, the NIH established a "Plan for Expanded Access to Articles and Science."

(c) Initiatives at the National Science Foundation (NSF)

- As of January 2011, applicants for NSF funding were required to prepare a mandatory "Data Management Plan."
  The term "data" here includes items such as research data, publications (articles), samples, collected by-products, software, and models.
- The NSF released its public access plan ("Today's Data, Tomorrow's Discoveries") on March 18, 2015.

(d) CHORUS (Clearinghouse for the Open Research of the United States)
A public-private consortium founded in autumn 2013 to promote open access to the results of publicly funded scientific research. In August 2014, Chorus entered into an agreement with Portico, a U.S. non-profit service that archives academic content in electronic form, to provide storage assistance to help ensure long-term access to the results of publicly funded research. Members of the CHORUS Board of Directors include representatives from the American Chemical Society (ACS) and from publishing companies such as Elsevier and Wiley. The Royal Society of the U.K. is a member of CHORUS.

(ii) U.K.

(a) The Finch Report and responses from the U.K. Government
1) The Finch Report
In June 2012, the Research Information Network (RIN) released a statement regarding the transition to open access known as the *Finch Report*. This statement stated that the results of research receiving public funds should be used for public benefit.

- Transition to the Gold OA model, in which publishing fees are paid in advance.
- For the nation's population, cost-free access to international academic literature owned by members of the Publishers Association in the U.K. should be provided via public libraries.
- The same access rights enjoyed by universities should be provided to high-tech firms at a low cost.

2) The House of Commons BIS Committee
In response to the Finch Report, the BIS committee of the House of Commons released a report in September 2013 that calls for the U.K. Government to revisit its open access policies.
- Rethinking the bias toward Gold OA, embargos, hybrid OA, and other topics

3) Movements by the British Government

- Response to the Finch Report

Upon receipt of the Finch Report in July 2012, the U.K. Government released public comments. In response to these actions, the Research Councils U.K. (RCUK) amended their open access policy that same month.
- Recommendation to provide open access (Gold OA) via open access journals

- Response to the House of Commons BIS Committee

In November 2013, the premise was stated that Gold OA would be most effective in the long term. It was noted that recognition of this direction does not differ from the position of the House of Commons, and it was agreed that, for the time being, the proper ratio of Gold OA to Green OA would depend on trends among researchers.

- Promotion of open science

In December 2014, the U.K. Government announced a "Science, Technology, and Innovation Strategy." This document clearly calls for the promotion of open science. Based on the Finch Report, the report calls for open access via Gold OA (though Green OA is also accepted) for ultimate purposes and for studies to investigate the transition to open availability of research data.

(b) Movements by the RCUK
In 2005, this organization released an open access policy. In accordance with the guidance of the June 2012 Finch Report, the RCUK released a new open access policy in July 2012.

・ Objectives of the policy
The goal of the policy is to realize instantaneous, unlimited, and free access to published results prepared using public funding that have been peer-reviewed and published. The policy also calls for all articles to state their funding sources in detail, and, where relevant, to describe how readers may obtain the essential resources for the research, including data and samples.

(iii) EU

In July 2012, open access guidelines for Horizon2020, a project that addresses the years between 2014 and 2020, were established. These guidelines apply to all participants in Horizon2020 projects, and thus researchers from Japan may also be affected by the guidelines.

(iv) India

(a) The Indian Ministry of Science and Technology
Two supporting organizations within this Ministry, the Department of Science & Technology (DST) and the Department of Biotechnology (DBT), announced open access policies in December 2014. These policies require that supporting data for the final draft of articles be stored in institutional repositories and available for public access.

- Data must be stored within 2 weeks of the date the article is received.
- In embargo cases, the data must be made publicly available after the embargo.

** Recommended embargo durations are 6 months for science, engineering, and medical articles, and 12 months for arts, humanities, and social science articles.

(b) Indian Council of Agricultural Research (ICAR)
In September 2013, ICAR ratified an open access policy that directs the research institutions it oversees to prepare open access institutional repositories.

(c) Council of Scientific & Industrial Research (CSIR)
In February 2009, CSIR made the following recommendations regarding open access to articles to the more than 40 research institutions it oversees.

1. All published results presented at CSIR laboratories will be made available through open access, either by storage in an institutional repository or by publication in an OA journal.
2. All journals published by CSIR will plan to become OA journals.
3. Each research institution will establish an institutional repository that allows shared use.
4. CSIR and its institutions will establish a center for collecting full text or metadata on articles.
5. Each institution will establish an electronic article repository.
6. Educational conferences on the subject of open access will be convened.

7. Open access-related training will be conducted internally.
8. The awareness of CSIR researchers will be heightened.

(v) China

In May 2014, two Chinese institutions, the Chinese Academy of Sciences (CAS) and the National Natural Science Foundation of China (NSFC), announced plans to move toward open access via the Green OA route. Authors of articles are required to store the final version of articles accepted in an institutional repository within 12 months following the publication of the article. It was also recommended that articles previously published be provided.

Appendix 3. Data repositories for research data and other resources in foreign countries

(A) Data repositories and associated institutions

(i) Institutional repositories (data archiving facilities at data producing institutions)
These play a major role as archival systems operating atop the Internet for the storage and communication, in electronic formats, of intellectual products produced at universities and other research institutions.

(ii) Subject-specific repositories
(a) National repositories
(b) Scientific and technical libraries, university libraries, and similar institutions
(c) "Data organization portals" and similar organizations run by national governments.

Reference: The data sharing policy established by the U.S. NIH: NIH Data Sharing Policy, October 1, 2003
8. Administrative Requirements, 8.2 Availability of Research Results, 8.2.3 NIH Public Access Policy, 8.2.3.1 Data Sharing Policy

Overview
- Seeks to ensure sharing of data arising from basic research, clinical research, surveys, and any other NIH-funded research.
- Researchers must prepare a Data Sharing Plan when applying for NIH funding.

Content
With this policy, the NIH hopes to ensure that any data arising from research it supports (in particular, specialized data obtained from NIH-funded research) can be shared with others. The policy establishes the following guidelines for data sharing.

1. Methods of data sharing
The following methods are envisioned (the NIH itself does not provide an environment for data sharing):
- Publishing: articles and links to scientific publications
- Efforts for individual researchers to assist themselves: Results are to be provided directly to those who request them by methods such as mailing a CD-ROM.
- Data loans: Qualified researchers may, within environments subject to security controls, use data to conduct analyses.
- Data archiving: Researchers must maintain an environment in which data may be stored and provided.

2. Consideration of individual rights
- With regard to data sharing, individual rights will be considered and all relevant legislation shall be obeyed.

3. The duration of data sharing
- The time interval over which data sharing is to take place is anticipated to begin when the public availability of any publication (article) using any dataset produced by the research is recognized.

4. The cost of data sharing

- Researchers receiving NIH assistant may request funding from the NIH to defray costs associated with data sharing.

References: (1) NIH Policy Statement, (2) NIH Data Sharing Policy Brochure

(B) Responses of major overseas academic publishing companies

1. In increasingly frequent cases, publishing companies are encouraging the public release of usable data together with the submission of published results. In many cases, the recommended location for data storage is an overseas institution. This means that, when Japanese researchers submit manuscripts, their most cutting-edge research data may be stored in foreign institutions.
2. An active international debate regarding sustainable operational models for data repositories is currently underway. In some models, there are cases in which fees are collected upon each use of stored data. This means that access to Japanese research data could require the payment of fees to overseas institutions.
3. In Europe, Australia, and the U.S., investigations regarding the development of individual data repositories and mechanisms for storing and managing data are currently in progress.

Appendix 4. The current state of open access (data) journals in the academic publishing world

(i) The publication of open access journals

Awareness of open science is spreading at an accelerated pace throughout the academic publishing world, and open access journals are increasingly being published. The initial responses of publishing companies to the open access movement have included: (a) providing free access to paid-subscription journals after a fixed period of time; and (b) offering hybrid journals, which give the authors of articles published in traditional subscription-based journals the option of paying an article processing charge (APC) to allow open access. In recent years, journals adopting a Gold OA model, in which authors pay an APC to allow open access to their articles from the start, have been seen. Open access megajournals composed of large numbers of articles have also been published. The average APC at an open access journal is around $3,000.

(ii) The publication of open access data journals

Several major publishing companies have begun actively moving to present research data sets in the form of journals by publishing open access data journals. For example, since May 2014, the Nature Publishing Group has published Scientific Data that is easily associated with original articles. This innovation has had a significant impact on the academic world. Among the features of this journal are that it is peer-reviewed and that it may be registered for searches by major index services. Nature also insists that metadata, known as a *data descriptor*, be assigned as a necessary condition for article submission.

Appendix 5. About the Expert Panel on Open Science, based on Global Perspectives

November 13, 2014
Cabinet Office, Government of Japan
Science, Technology, and Innovation Division
Director-General for Policy Planning

1. The mission of the Committee

We hereby convene the Expert Panel on Open Science, based on Global Perspectives (referred to below as "the Panel.") The mission of the Committee shall be as follows: (a) to obtain a thorough grasp of current trends in the global discussion surrounding open science; (b) to clarify Japan's basic posture regarding open science; and (c) to investigate policies that Japan should implement either immediately or over the medium-to-long term.

2. The membership of the Committee

(A) The Panel shall be composed of (a) members of Japan's Council for Science, Technology, and Innovation, and (b) external experts. The Panel shall be convened by the Director-General for Policy Planning, the Science, Technology, and Innovation Division within Japan's Cabinet Office.
(B) The Director-General for Policy Planning of the Science, Technology, and Innovation Division will select a Panel chairperson from among the members of the committee.
(C) The Panel may request the participation of outside experts as necessary.

3. Public disclosure

The proceedings of the Panel will, by default, be disclosed to the public.

4. Administration and general affairs

The Panel's administration and general affairs will be handled by the Director-General for Policy Planning of the Science, Technology, and Innovation Division.

Appendix 6. Panel Members

External Experts (in the order of Japanese alphabet)

Jun Adachi
Professor, Digital Content and Media Sciences Research Division
National Institute of Informatics

Setsuo Arikawa
Emeritus Professor and Former President
Kyushu University

Kiyoshi Suehiro
Senior Researcher
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
Yokohama Laboratory

Satoshi Sekiguchi
Deputy Director General
Directorate for Information Technology and Electronics
National Institute of Advanced Industrial Science and Technology (AIST)

Mikiko Tanifuji
Office Chief
Scientific Information Office
Planning Division
National Institute for Materials Science

Naoyuki Tsunematsu
Principal Advisor
Department of Information Planning
Japan Science and Technology Agency

Kazuhiro Hayashi
Senior Researcher
Science and Technology Foresight Center
National Institute of Science and Technology Policy

Yasuhiro Murayama
Director, Integrated Science Data System Research Laboratory
National Institute of Information and Communications Technology (NICT)

Members from the Council for Science, Technology, and Innovation

Yuko Harayama
Takashi Onishi

Appendix 7. Panel Meeting Schedule

Meeting 1: Tuesday, December 9, 2014, 10 AM to12 PM

- Report from panel members regarding (a) a high-level overview, ranging from open access to open science, including a summary of key points, and (b) international trends in open data
- Exchange of opinions regarding matters such as the concept and current state of open science

Meeting 2: Tuesday, January 20, 2015, 3 PM to 5 PM

- Report from panel members on the basics and unique characteristics of policies related to open science around the world
- Exchange of opinions regarding the current state of open access journals, the open release of research results and research data, and philosophies regarding basic policies for promoting open science

Meeting 3: Monday, January 26, 2015, 10 AM to 12 PM

- Hearing from experts about (a) the current state and future development of institutional repositories for open science, (b) the history of the ICSU-WCD and public release of data, and (c) sharing of data in the life sciences
- Exchange of opinions regarding topics such as (a) which data should be subject to public availability, and (b) what type of report should be produced by this panel (image)

Meeting 4: Monday, February 23, 2015, 10 AM to 12 PM

- Hearing from experts regarding material innovations and the accelerating pace of trends in open science; also, hearing from publishing-industry representatives regarding open science initiatives in the academic publishing world
- Exchange of opinions regarding topics such as (a) the current status of open data initiatives, and (b) the rough draft of the report to be produced by this panel

Meeting 5: Monday, March 23, 2015, 10 AM to 12 PM

A wrap-up discussion to summarize the work of the panel

Meeting 6: Monday, March 30, 2015, 3 PM to 5 PM

A wrap-up discussion to summarize the work of the panel

Appendix 8. Glossary of Terms

APC (Article Processing Charge)
A fee paid to a publishing company or other entity by the author of an article, or by that author's affiliated institution, to ensure open access to the author's work. The phrase is translated into Japanese in various ways: *ronbun syori hiyou* (article processing fee), *ronbun keisairyo* (article listing fee), or *ronbun shuppan kakoryo* (article publishing processing fee).

API (Application Programming Interface)
An interface provided by an operating system or a software application to allow access from other software applications to portions of the functionality provided.

DOI (Digital Object Identifier)
A digital identifier permanently assigned to electronic data on the Internet. In this report, the term is primarily used to refer to published results and other research data. The assignment of a DOI helps to overcome mishaps in search engine functionality due to factors such as expired URLs.

DOIs are assigned to articles published in academic journals such as *Nature* and *Science*, as well as to articles published in journals from academic societies such as the ACM (Association for Computing Machinery) and the IEEE (Institute of Electrical and Electronics Engineers).

SPARC Japan (International Scholarly Communication Initiative)
The Japanese chapter of the Scholarly Publishing and Academic Resources Coalition (SPARC), an institution launched in the U.S. in response to the serials crisis, that calls for reform in academic communications.

Embargo
In this report, the term "embargo" is used to refer to a fixed period of time following the publication of an article in a paid-subscription journal during which the full text of the article may not be accessible via a repository or aggregator (a service that provides electronic journals or other electronic documents from multiple publishers organized by fields of research). Expanding on this concept, the idea has also arisen to allow access to other research results, including research data, after a fixed embargo period.

Persistent Object Identifier
Digital information that uniquely identifies the origin of a piece of research (the researcher, the research institution, the research facility, the article, the data, the resources, the samples, the prototypes, etc.), and which has a useful lifetime equivalent to or longer than that of the origin of the research.

Institutional repository
An Internet archive system used to store and communicate intellectual products generated by a university or other research institution in electronic formats.

Creative Commons License
Creative Commons is the name of an international non-profit organization and the project it oversees; this organization provides the Creative Commons License (CC License). The CC license seeks to disseminate new copyright rules appropriate for the Internet era; it is a tool by which authors of various works can themselves assign statements to the effect that "You are free to use my work as

long as you obey certain conditions." By using the CC license, authors can freely distribute their work while retaining copyright control, while users of the work can redistribute and remix the work within the confines of the license agreement. Data generating copyright typically corresponds to the CC-BY, while data that does not generate copyright typically corresponds to the CCO.

Green OA
An OA model in which authors bear no direct cost. Institutional subscriptions are the primary element of this model. In this model, the author creates an electronic archive of the final, peer-reviewed version of an article. This archive is collected in an organization- or research-field-specific repository, where it becomes available for public access after a fixed embargo period, during which time access is prohibited. The length of the embargo period varies depending on institutional policies. The primary advantage of the Green OA model is that it allows authors to offer public access to articles and other information published in paid journals without a direct cost burden on the author.

Gold OA
An OA publishing model in which the author pays. In this model, after the receipt of an article submitted by an author, the author pays an APC to the publishing company to allow the article to be published. The advantage is that the article becomes available for free access at the time it is published. In addition, articles published under the Gold OA model receive value-added services such as navigation, searching, and alerts for electronic publications, increasing their visibility and rate of utilization.

Semantics
A technology for allowing computers to interpret as accurately as possible the meaning of a document or a piece of information; it is used to automate processes such as associating documents or collecting information.

Data curator
A staff member who plays an analytical role that includes identifying the most useful data set among a large number of data sets, fixing or correcting these data sets as necessary, and combining multiple data sets.

Data-driven
The data-driven model is one of the abstract computational models considered in the field of computer science. In data-driven computation, the data generated by one computation are used to initiate the next computation, and eventually, a chained sequence of computations is executed.

Data set
A collection of data items arranged according to certain rules. A data set contains control data needed to grant access to the operating system that oversees the computing system as a whole. The data set is the largest unit of information read from or written to storage devices by application programs in the form of data files.

Metadata
Search information assigned to publicly-released data that indicates the type of that data. Metadata may include items such as the date of creation of a piece of data, the data creator, the data format, the title of the data, and explanatory notes. Metadata is important for allowing data to be efficiently searched and maintained in a unified manner.

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