

# Strategies and Practices of Research Libraries in Promoting Open Access: A Case Study of the National Science Library

**Authors:** Xiaolin Zhang, Liu Xiwen, Li Lin, Zeng Yan, Gu Liping

**Date:** 2016-06-07T00:00:00+00:00

## Abstract

From the perspective of the National Science Library (abbreviated as “NSL”) acting as the China OA Officer of the Chinese Academy of Sciences and a key promoter of open access to scientific and technological information, this study employs a multi-dimensional structural approach to propose an open access strategic framework for NSL, and introduces NSL’s open access practices, including assisting the Chinese Academy of Sciences in establishing open access strategies, organizing open access research and knowledge dissemination, constructing the institutional repository network of the Chinese Academy of Sciences, and supporting CAS authors in publishing open access papers.

## Full Text

### Abstract

From the perspective of the National Science Library (NSL) serving as the Chief OA Officer for the Chinese Academy of Sciences (CAS) and a key promoter of open access to scientific and technical information, this paper proposes a multi-dimensional strategic framework for NSL’s open access initiatives. It introduces NSL’s open access practices, including assisting CAS in establishing open access strategies, organizing open access research and knowledge dissemination, building the CAS Institutional Repository Grid, and supporting CAS authors in publishing open access papers.

**Keywords:** open access; strategy; policy; open repository; open publishing

## 1 Introduction

Open access has become an essential component of scholarly communication. In some scientific fields, it is approaching a tipping point to become the mainstream

form of academic information resources [1]. However, the open information environment encompasses various disruptive changes and unexpected challenges [2]. Libraries can no longer rely on traditional subscription and publishing models to address this new open environment; they must redefine, create, and realize new roles and contributions for libraries in the digital open network.

Although we still face uncertainties, risks, and even inevitable failures, libraries have no path of retreat. On one hand, the rapid development of new paradigms for digital research and learning [3-4] is driving the construction of open knowledge infrastructure and services to support data-intensive scientific research and discovery. On the other hand, the academic community is pushing open access more forcefully. The recommendations for the next ten years of open access, proposed on the 10th anniversary of the Budapest Open Access Initiative in 2012 [5], call for making openness the default state of scholarly communication and aim to make open access the mainstream method for disseminating peer-reviewed research papers across all disciplines within ten years. For libraries, the time to actively engage with open access and integrate into the open information environment is long overdue [6]. Decisive and swift action is needed to play an important, even irreplaceable role in the open information environment and emerging research and education paradigms, leveraging professional expertise to formulate better policies and provide higher-quality services for their institutions and communities, competing with market leaders, and participating in rule-making. Many institutions have already launched relevant pilot programs, such as the Coalition of Open Access Policy Institutions (COAPI) [7] composed of North American universities that have established or are developing open access policies, the Compact for Open Access Publishing Equity (COPE) [8] aimed at promoting the development of institutional open publishing funds, and the UK Open Access Implementation Group [9].

## 2 Redefining Needs and Library Roles in the Open Access Environment

The National Science Library (hereinafter referred to as NSL) examines open access needs from three different but closely related perspectives (see Figure 1). What do research and education institutions need in open access? They need open knowledge infrastructure (OKI) embedded in research and learning processes to support data-intensive scientific discovery. What do scholarly communication systems need in open access? They need to utilize the transformation process to create entirely new methods for knowledge creation, dissemination, organization, and evaluation. What can libraries contribute in this open access transformation? They need to consider their roles and services from the perspectives of research institutions, education systems, and scientific communication processes. It should be noted that Figure 1 [Figure 1: see original paper] itself is merely a tool for exploration and reflection; most importantly, we must think outside the box—beyond traditional library resource construction and information retrieval services, and beyond conventional passive responsive or follower

role positioning.

From these three perspectives, NSL believes it should play roles in the following areas:

- **Chief planning organizer for CAS open access and chief manager of open knowledge infrastructure.** Tasks include: researching and proposing CAS open access strategies and policies; organizing and managing major CAS open access programs; developing and managing important OKI components; coordinating CAS OA/OKI collaborations; and providing consultation and support for OA/OKI strategies and policies at CAS institutes.
- **Leading promoter of open access in China and key developer of China' s open knowledge infrastructure.** Tasks include: researching and proposing OA/OKI strategies and policies for China' s research and education communities; developing and organizing OA/OKI standards, services, and system tools for research and education; initiating and coordinating OA/OKI action plans for research and education; and representing China, CAS, and the research and education communities in OA/OKI policy, cross-domain, and international dialogues.
- **Leading promoter of OA/OKI in China' s library community.** Tasks include: researching and recommending OA/OKI strategies and policies for libraries; developing and recommending OA/OKI standards, guidelines, services, and system tools for libraries; initiating, organizing, and coordinating OA/OKI activities in the library community; representing libraries in dialogues with other stakeholders on OA/OKI; and serving as an innovation pilot base for OA/OKI services.

NSL is committed to implementing OA/OKI strategies proactively yet cautiously: fully utilizing opportunities provided by the internet and market development to experiment with open access; actively testing multiple open access options to prepare for development opportunities from various sources; conducting practice based on reliable evidence; monitoring possible negative outcomes; combining new measures with reforms to traditional services; and ensuring political support and economic sustainability for actions. The current work layout is shown in Figure 2 [Figure 2: see original paper] (which is also an open exploration rather than a completely fixed model).

### 3 Supporting Open Access Strategy and Policy Research

Open access requires multi-faceted and multi-level strategies and policies, all of which must be built upon rich information and reliable research. Therefore, we propose a preliminary work framework for open access strategy and policy research, as shown in Figure 3 [Figure 3: see original paper].

#### **Figure 3. NSL Open Access Strategy and Policy Research and Promotion Framework**

Striving to become the chief researcher and formulator of open access strategies and policies, NSL has implemented several initiatives:

### **3.1 Tracking Open Access Development Trends**

NSL has established a tracking group composed of staff and graduate students to continuously monitor international open access developments. Important content and research findings are compiled and released monthly as tracking scan reports on NSL's institutional repository for open access [10].

### **3.2 Key Issue Research**

NSL organizes staff to conduct research on critical open access issues, completing research reports such as "Open Access Development Strategies and Trends" [11], "Traditional Publisher Open Access Policies and Practices" [12], and "Guidelines for Institutional Repository Content Deposit and Dissemination Rights Management" [13]. At the first China OA Week held in October 2012, NSL systematically presented other research findings on open access, covering studies on open access publishing support policies for research institutions and funding agencies [14], open access journal evaluation and selection criteria [15], and the current status of open access journal publishing in China [16]. Copyright, information literacy, and electronic publishing issues have also been incorporated into the open access research agenda.

### **3.3 Strategy and Policy Formulation**

Based on long-term tracking research, NSL, as the primary researcher, drafted the CAS Open Access Strategy Statement, which was released at the 8th Berlin Open Access Conference hosted by CAS in 2010. The strategy statement expresses CAS's support for open access to publicly funded research results, support for building institutional repositories at CAS institutes, active experimentation with open publishing, and active participation in international open access cooperation. NSL drafted and released the first domestic policy guidelines for depositing and disseminating publicly funded research results in institutional repositories [17]. NSL's research on open access support policies and open access journal evaluation and selection will also be incorporated into policy recommendations proposed to CAS and national-level authorities.

### **3.4 Promotion and Dissemination**

NSL established the China Open Access Portal in 2008 to release open access news, developments, and research reports, promoting open access domestically [18]. NSL has organized a series of international conferences related to open access, including the "International Symposium on Open Access Strategies and Policies for Scientific Information" (2005), the "International Workshop on Hot Issues of Digital Libraries and Copyright Law Application" [19] (2007), the "International Symposium on Generic Licensing for Scientific Literature and Sci-

entific Data” (2009), and the “8th Berlin Open Access Conference” [20] (2010). In 2012, NSL organized the first China OA Week [21], promoting open access through various forms including conference presentations, expert discussions, and roadshows for open access repositories and journals.

NSL has formed a dedicated core working team to further conduct policy research on open access and open publishing at the national, research funding agency, and CAS levels.

## 4 Supporting Open Publishing

NSL’s action framework for supporting open publishing is shown in Figure 4 [Figure 4: see original paper]. Key practices include:

### 4.1 Funding CAS Authors’ Open Publishing

NSL is the first Chinese institutional member of the open access publisher BioMed Central (BMC). After negotiating a discount on article processing charges (APCs), NSL represents CAS in paying 50% of the APCs for papers published in BioMed Central by CAS researchers and graduate students as first or corresponding authors. NSL’s support policy has the following characteristics: it insists on negotiating with publishers through a special open publishing fund to obtain APC discounts, ensuring that support for open publishing leads to lower costs; it insists on authors sharing APC costs, which helps authors remain sensitive to APC prices and assists in controlling them; it requires publishers (such as BMC) to provide additional services, including holding promotional training at relevant CAS institutes, providing training courseware and materials, and regularly providing reports on CAS authors’ submissions, publications, and usage; and reliable long-term local preservation of all OA papers from open access publishers is also a term in NSL’s cooperation with them, with work currently underway with BMC. NSL has also funded CAS authors publishing in the open access journal *New Journal of Physics* (NJP) in the same manner and has reached a local long-term preservation cooperation agreement with NJP’s publisher, the Institute of Physics Publishing. NSL is negotiating with other high-quality all-OA publishers to fund CAS authors’ open publishing according to the above mechanism. NSL has not yet involved itself in funding open papers in hybrid journals, mainly because the transparency mechanism for deducting subscription fees for hybrid journals has not been established.

### 4.2 Participating in Consortium Funding Plans for Open Publishing

In July 2012, NSL formally signed a letter of intent on behalf of CAS to join SCOAP3 (Sponsoring Consortium for Open Access Publishing in Particle Physics) [22], and will work with other participating institutions in SCOAP3 to convert library subscription fees for relevant journals into funds supporting open publishing in particle physics, achieving open access to peer-reviewed research papers in high-energy physics. NSL also participates as a member in SCOAP3’

s Steering Committee and Technical Working Group, and as the coordinator for Chinese institutions with large volumes of high-energy physics publications, 致力于组建 SCOAP<sup>3</sup>' s domestic consortium [23]. NSL will continue to participate in and promote similar initiatives.

### 4.3 Researching Policies to Support Authors' Open Publishing

NSL recognizes that elevating NSL' s open publishing funding policies to the national level faces complex challenges and has therefore actively conducted related research, such as criteria for evaluating and selecting open access journals; rights requirements for authors, their institutions, and funding agencies regarding the deposit, content reuse, and additional services for open papers in an open publishing environment; and cost-effective mechanisms for controlling APC prices through open access publishing funding. Based on this long-term research and experimentation, NSL is researching and drafting relevant national-level policy guideline recommendations.

### 4.4 Researching Policies to Support Journals' Open Publishing

The conversion of subscription journals to open publishing journals has become a realistic and urgent challenge. As the publisher and manager of 16 academic journals, NSL has drawn on its experience in funding authors to publish open access papers to conduct research on the challenges and countermeasures for converting subscription journals to open access journals, including calculation methods for open journal APCs, multi-channel revenue streams for open journals based on value-added services, and approaches to improving journal operational efficiency by reconstructing journal service flows and developing value-added services according to digital knowledge service platform utilization.

## 5 Building CAS Institutional Repositories

A major part of NSL' s work in promoting open access is building institutional repositories at CAS institutes [24]. NSL believes that institutional repositories are not passive storage facilities but rather institutional knowledge asset management mechanisms and knowledge service platforms, as shown in Figure 5 [Figure 5: see original paper].

### Figure 5. NSL Institutional Repository Construction Framework

The success of CAS institutional repositories stems from the following factors: (1) Positioning the institute as the main body for repository construction—as an independent legal entity, the institute can effectively require and support the deposit of research results and is most concerned about the long-term preservation and dissemination impact of its research outcomes. (2) Positioning the institutional repository as a knowledge management tool (rather than a library tool) dedicated to solving the institute' s concerns about preserving and utilizing its own research results, while also positioning it as a research impact management

platform to meet the institute' s needs for disseminating its research outcomes. (3) Designing an integrated solution for institutional repository construction and services, rather than merely providing repository platform software. NSL has organized a technical team, promotion service team, and policy research team, established an online support forum for immediate training and consultation, and helped institutes build their repositories. (4) Providing value-added services for authors and institutions to increase the attractiveness and stickiness of institutional repositories, such as automatically generating author homepages and assisting in generating knowledge maps for institutes or across institutes. (5) Combining institutional repository construction with reform of institute libraries, extending institute library services to institutional repository services and knowledge management, and laying a foundation for the sustainable development of institutional repositories. The most important lesson from this experience is that institutional repository construction must not be treated as merely a library matter or simply as document preservation or open access.

A key factor in the rapid development of CAS institutional repositories is that NSL has carefully reviewed relevant copyright clauses and regulations on intellectual property management for publicly funded research results. Based on this review, NSL systematically analyzed the rights mechanisms of various stakeholders involved in content preservation and dissemination in institutional repositories [13], and proposed a rights chain for public institutional knowledge assets (see Figure 6 [Figure 6: see original paper]), providing a solid foundation for institutes to understand the permissions and restrictions of all parties involved in depositing, publishing, and preserving content in institutional repositories.

### **Figure 6. Rights Management Relationships for Public Institutional Knowledge Assets**

NSL launched the institute institutional repository construction program in 2007. Currently, more than 70 institutional repositories have been built and put into operation, with over 20 additional institute repositories under construction [25]. As of October 2012, the total number of full-text documents stored in various institutional repositories exceeded 265,000, with total downloads reaching more than 4 million. Downloads in 2012 alone accounted for over 50% of total downloads, with more than 20 papers receiving over 200 international downloads each. In the international open repository registries OpenDOAR [26] and ROAR [27], CAS institute repositories account for two-thirds of China' s total institutional repositories.

## **6 Future Work**

NSL is committed to promoting open access to scientific and technical information and driving transformation in the library community toward open access. In addition to the work mentioned above, NSL has begun experimenting with collecting and organizing open access conference resources and open educational resources, as well as piloting the long-term preservation of open journal full-text

data in XML format and constructing open linked engines. At the same time, NSL is committed to promoting OA through open approaches, releasing its institutional repository software CSpace as open source software [28], initiating and organizing the China arXiv.org Service Working Group and China Institutional Repository Promotion Working Group composed of major domestic libraries to promote the use of arXiv.org [29] in China and coordinate the advancement of institutional repository construction in China [30]. NSL will further strengthen the implementation of its open access strategy to address the rapidly evolving open access environment.

NSL clearly recognizes that open access has brought disruptive impacts to traditional libraries [31], and that open access itself contains many uncertainties and changes. However, complexity and risk are precisely reasons for strategic innovation. In this competitive era of “lead or be eliminated,” we cannot wait nor dare to wait. We must seize the opportunity of open access to restructure the knowledge service landscape and create and develop the library’ s position and contributions in future research and learning environments.

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### Current Status of OA Publishing in China—Based on a Survey of Journals by CAST

**Abstract:** Based on a survey of 79 OA journals of CAST, this paper discusses the current development, obstacles, plans and expectations, and analyzes the status of OA publishing in China. Finally, some proposals are suggested from the perspectives of training and operational guidance, platform development, institutional repository development, open access policy making, feasible business model and effective motivation measures.

**Chu Jingli, Li Lin, Shen Dongjing, Zhang Xiaolin, Zhao Yurong** National Science Library, Chinese Academy of Sciences, Beijing 100190

**Keywords:** open access; scientific journal; open access policy; CAST

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### The Strategies and Practices of Research Library to Support Open Access: Taking National Science Library as an Example

**Abstract:** This paper describes the open access (OA) strategies and practices of National Science Library (NSL), as the Chief OA Officer of Chinese Academy of Sciences (CAS) and the Key Promoter of China scientific and technical information OA. A multi-dimension OA strategy framework of NSL is developed. Major OA practices by NSL are described, including CAS OA Strategy development, OA research and promotion, CAS IR system, and support for OA publishing by CAS authors.

**Zhang Xiaolin, Liu Xiwen, Li Lin, Zeng Yan, Gu Liping** National Science Library, Chinese Academy of Sciences, Beijing 100190

**Keywords:** open access; strategy; policy; open repository; open publishing

*Note: Figure translations are in progress. See original paper for figures.*

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