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**Preprints refer to draft versions of research papers that have not yet been formally published in peer-reviewed academic journals. As an important form of scholarly communication, preprints have been used for decades in fields such as physics, mathematics, and astronomy. In recent years, with the...**

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### **Abstract**

To satisfy the need to protect authors' right of first publication and to promote the preservation and dissemination of outstanding Chinese scientific research achievements to serve the Chinese scientific community, the Chinese Academy of Sciences' Scientific Paper Preprint Platform (ChinaXiv) has launched a project construction initiative. This initiative aims to encourage researchers to promptly publish their research achievements on a public preprint platform, solicit peer reviews and suggestions through the platform, facilitate broader academic exchange, and promote open access to research outcomes. Based on practical work experience, this paper elucidates how ChinaXiv constructs a preprint service platform operating in compliance with internationally recognized models and standards, covering multiple dimensions including construction background, system development and services, domain expansion and cultivation, organizational management mechanisms, promotion and publicity models, current status of construction, and future development directions, thereby providing a reference for the development of other preprint platforms.

## Full Text

### ChinaXiv: Building a Preprint Service Platform Following International Standard Operating Practices

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## Abstract

To protect authors' priority rights and promote the preservation and dissemination of outstanding Chinese scientific research achievements within China's scientific community, the Chinese Academy of Sciences has launched the ChinaXiv (Scientific Article Preprint Platform of Chinese Academy of Sciences) project. This initiative aims to encourage researchers to publicly share their research findings on a domestic preprint platform at the earliest possible time, receive peer reviews and suggestions through the platform, facilitate broader academic exchange, and promote open access to scientific results. Based on practical implementation experience, this paper describes how ChinaXiv constructs a preprint service platform operating under internationally recognized standards, covering aspects including construction background, system development and services, domain expansion and cultivation, organizational management mechanisms, promotion strategies, current status, and future development. This work provides a valuable reference for other preprint platform initiatives.

**Keywords:** ChinaXiv; Preprint; Open Access; Academic Communication

With the continuous development of open access, open research, open data, and open innovation, major scientific nations have introduced national open science policies to facilitate broader access to publicly funded research outcomes. Domain-based preprint systems and open archives for published papers have gained increasing attention, with several important disciplinary digital repositories earning recognition from research communities, journal publishers, database providers, and digital libraries. These platforms effectively complement traditional journal-based publishing and have become recognized as a new form of academic exchange platform. For instance, arXiv, created by quantum physicist Paul Henry Ginsparg in 1991, ushered in the era of electronic preprints and has become the authoritative platform for preprint deposit and distribution in physics, mathematics, computer science, quantitative biology, and statistics [1]. Russian mathematician Grisha Perelman's proof of the Poincaré conjecture in the early 2000s was famously posted on arXiv. The Social Science Research Network (SSRN) [2] promotes rapid global dissemination of social science research, encouraging researchers to share early-stage findings through abstracts and papers across fields including finance, accounting, law, economics, and management. As a free open platform for social science papers, SSRN en-

joys widespread support from academic researchers. In 2013, the non-profit Cold Spring Harbor Laboratory (CSHL) launched BioRxiv [3] to create a dedicated preprint repository for biologists. Unlike traditional publishing models, authors can publicly share drafts before journal submission to receive community feedback and suggestions for improvement. Additionally, various domain-specific preprint platforms have emerged, including PsyArXiv for psychology, AgrXiv for agriculture, engrXiv for engineering, and ChemRxiv for chemistry.

The ChinaXiv project is organized by the Bureau of Science Communication of the Chinese Academy of Sciences, with specific guidance from the Bureau of Development and Planning, implementation by the National Science Library of Chinese Academy of Sciences, and participation from relevant institutes and journal editorial offices. After more than a year of construction, ChinaXiv has gained significant influence in the scientific community, attracting attention from researchers and students and receiving strong support from renowned scientists.

### 1.1 Construction Requirements

The development of a preprint platform addresses the need to preserve outstanding Chinese research achievements and serve the domestic scientific community. Currently, China's latest research findings are predominantly published abroad first, and even when using open preprints, they are stored on foreign platforms, making them less accessible to Chinese researchers in a timely and effective manner. Preserving Chinese research achievements domestically is crucial for protecting priority rights recognition, safeguarding intellectual property, and enhancing the visibility and competitiveness of Chinese scientific output.

The platform's construction also responds to the need for promoting open access to Chinese research. For scientists, research institutions, and funding agencies, ensuring public availability of research outcomes has become a major scientific and social responsibility. Establishing China's own open repository supporting pre-publication and post-publication archiving will effectively advance open access to scientific results.

Furthermore, the platform facilitates the formation of open academic exchange mechanisms in relevant fields. Through instant, interactive features such as open commenting, the platform promotes collaboration and stimulates innovative thinking to produce more outstanding research. By coordinating relationships among scientists, journals, and academic societies, the platform bridges these stakeholders, accelerates and improves scientific communication, and helps build a healthy academic exchange ecosystem.

Finally, the platform effectively protects authors' priority rights and monitors academic misconduct. Given the competitive nature of scientific research, protecting priority rights requires preventing theft and unauthorized publication of academic achievements. Through open publication and commenting, preprint platforms prevent plagiarism by reviewers during peer review and enable broader

community oversight of research findings, thereby monitoring academic misconduct and fostering a transparent and fair academic environment.

## 1.2 Objectives and Positioning

As an important component of the Chinese Academy of Sciences' "13th Five-Year Plan" for scientific journals and its initiative for reform and development of scientific journals, ChinaXiv, based at the Chinese Academy of Sciences, provides preprint deposit and open archiving services for scientific papers in both Chinese and English to researchers nationwide. The platform aims to establish a new form of community-governed platform for research communication and sharing that effectively complements traditional journal-based publishing. This initiative holds significant meaning for encouraging fair competition among researchers, protecting priority rights recognition, promoting open access, facilitating broader academic exchange, building a transparent academic ecosystem, and supporting the intensive and international development of scientific journals and research publishing.

ChinaXiv's construction objectives include: (1) Establishing a service mechanism of "open deposit + quality inspection + academic exchange + distribution + open review" to create a reliable, standardized, and authoritative domestic preprint platform for Chinese scientists through reliable priority rights registration, immediate open access, comprehensive author and reader services, and effective journal services, enabling open archiving and distribution of preprints. (2) Developing effective mechanisms to attract readers and journals, organizational management systems, and sustainable operation models, embedding academic exchange tools to build ChinaXiv into a new academic exchange platform widely recognized by China's scientific community and with international influence. (3) Achieving cooperative support with Chinese Academy of Sciences journals by establishing partnerships to integrate outstanding preprint resources into the journal editorial system, effectively supporting journal construction while providing convenient services to help researchers disseminate their work and enabling publishers to access high-quality papers promptly.

## 2 Platform Construction and Services

The ChinaXiv service platform is designed to support deposit of papers in both Chinese and English through multiple submission methods. It employs automated checking and association tools to assist administrators in reviewing submitted papers and ensuring quality, while providing multi-dimensional browsing capabilities that allow users to track topics and articles of interest. Based on open access principles and thorough analysis of preprint resource types and characteristics, ChinaXiv has developed a universal, open, extensible, and modular overall construction plan that facilitates effective integration with third-party systems to maximize the advantages of preprint resources and services. The overall framework is shown in Figure 1 [Figure 1: see original paper]. Specific construction aspects include:

- (1) For authors, the platform has established a paper submission system, submission review management platform, and automated checking and association engine. The submission system supports multiple methods including email submission, online submission, and even batch submission, addressing details such as authorship confirmation, license statement confirmation, and integrity commitment. The review management platform supports automatic compliance checking, duplicate detection, plagiarism checking, author and co-author identification and association, and automatic assignment of unique identifiers to facilitate quality management.
- (2) Based on preprint data, the platform has established domain repositories open to all natural science fields, receiving preprints in both Chinese and English across all disciplines. Additionally, specialized preprint sub-platforms have been created for relevant academic societies, journals, and publishers, significantly expanding the platform's usage and influence. As an open access service platform, all papers are freely accessible without subscription fees, allowing users to view, browse, search, and retrieve all recent research outcomes. The platform also provides commenting functions to support online academic exchange and paper review.
- (3) A journal cooperation mechanism has been established to enable technical integration between preprints and journals, prioritizing the inclusion of outstanding preprint resources into the Chinese Academy of Sciences journal editorial system to support journal construction. The platform helps researchers publish and disseminate their findings while enabling publishers to access high-quality papers promptly. Cooperative journals have their own dedicated preprint sub-platforms that can be customized and managed, with the system recommending outstanding papers to journals based on impact and evaluation.
- (4) Open service interfaces have been established for third-party systems, including ingestion tools, distribution tools, and research infrastructure public interfaces. As an open repository platform, ChinaXiv provides effective OAI interfaces based on the OAI protocol, enabling integration of platform data and applications into third-party platforms such as the Chinese Academy of Sciences Documentation and Information Center's integrated retrieval platform and China Science News platform. The platform fully integrates public research infrastructure identifiers such as ORCID for authors, DOI for papers, and data IDs to effectively utilize public open resources.

### 3 Domain Development and Cultivation

Domain-based preprint repositories have become an important new channel for academic exchange, making domain development and cultivation critical for ChinaXiv's construction and growth. The success of arXiv is closely related to its initial focus on high-energy physics, which has since expanded to become

essential academic infrastructure for physics, mathematics, computer science, quantitative biology, and statistics, with high preprint awareness among researchers in these fields [4]. China is a major research nation in astronomy, biology, mathematics, and materials science, with strong traditions in open access and knowledge sharing and solid disciplinary foundations within the Chinese Academy of Sciences.

Accordingly, ChinaXiv initially focused on developing and cultivating preprint deposit in physics, computer science, astronomy, biology, mathematics, and materials science. The project considered the existing foundations of scientists, academic societies, journal publishing, major research teams, key researchers, and relevant policies in these fields to establish cooperative relationships with related societies, journals, publishers, science media, scientist groups, and research teams. During development, ChinaXiv has subsequently expanded into space science, engineering thermophysics, marine science, and energy science. As promotion and outreach efforts continue, researcher awareness of preprints continues to grow, with many expressing needs for priority rights recognition and academic exchange. ChinaXiv now accepts preprint deposits in both Chinese and English across all natural science fields, gradually building a reliable and authoritative domain repository through continuous accumulation of author-provided and open data.

#### 4 Organizational Management Mechanism

In organizational management, ChinaXiv follows the arXiv model [5][6] and adopts internationally recognized preprint platform management mechanisms. At the advisory level, 25 experts from Chinese Academy of Sciences institutes and renowned domestic universities and libraries form the ChinaXiv Management Committee, Scientific Advisory Committee, and User Advisory Committee. The Management Committee guides platform operations, the Scientific Advisory Committee advises on repository domain planning, and the User Advisory Committee guides services and applications. Under the Management Committee, an Operations Working Group is responsible for routine platform functionality and data management, subdivided into four teams: system operations, paper quality management, policy research, and user services. These teams respectively handle platform construction and maintenance, policy and legal issues related to platform promotion, stakeholder rights, and platform qualifications, while also conducting domain-specific user training and promotional activities.

The organizational structure is illustrated in Figure 2 [Figure 2: see original paper]. In terms of business organization and service support, the Operations Working Group coordinates platform operations and services. Specifically, the system operations team performs routine maintenance of platform functionality and data, regularly updating versions, monitoring hardware operation and security, conducting data backups, and preparing for data volume surges after promotion. The paper quality management team reviews submitted papers, assists scientists with email submissions, ensures immediate and up-to-date pub-

lication of papers, and effectively organizes, monitors, and manages platform data to ensure accuracy and validity.

Regarding paper quality management mechanisms, the paper quality management team ensures preprint quality and prevents non-scientific papers from being published. The review team consists of 2-3 initial reviewers and 1 final reviewer who conduct timely review and publication on each working day. The basic quality control mechanism includes paper admission criteria (researcher identity verification, institution verification, presence of peer-reviewed papers in the same field), followed by format review, duplication checking, plagiarism detection, and research content verification to ensure papers are scientific. When a paper's research nature, scientific validity, or author identity cannot be verified, an expert review process is initiated. A domain review team of 2-3 expert authors provides review opinions, with the final reviewer making the determination on whether the paper meets inclusion criteria. Additionally, the platform monitors academic misconduct through immediate open publication, open release, and open commenting, enabling broad community oversight and exchange of research findings.

## 5 Promotion and Publicity Model

Current awareness of preprint platforms in China's scientific community remains at an early stage, making effective mobilization of author participation crucial for platform development. The project team has developed a three-tiered promotion model. At the foundational level, the platform improves functionality and integration with other systems to facilitate user operation, gains researcher recognition of ChinaXiv through various efforts, and recruits promotion ambassadors to leverage researchers' own networks. At the middle level, the platform combines internal efforts with external partnerships for multi-dimensional, diverse promotion. Internal initiatives include producing brochures, posters, videos, and newsletters distributed through WeChat, email, direct distribution, and major video platforms; organizing large-scale quarterly events and monthly training and promotional activities targeting institutes, journals, societies, and universities; implementing "Hundred Institutes Tour" and "University Roadshow" programs to directly engage researchers and encourage sharing of research findings; and expanding from key domains to all natural sciences to broaden the user base. External partnerships involve collaborating with institutes, journals, societies, and universities through subcontracts or cooperation agreements, with partners conducting or supporting promotional activities through embedded channels such as partner websites, special issues, mailing lists, or participation in academic events and conferences. For peer collaboration, the platform actively engages with other preprint platforms such as arXiv, bioRxiv, and SSRN to achieve win-win cooperation. Additionally, the platform maintains communication with User Advisory Committee and Scientific Advisory Committee members to leverage scientists' academic influence, obtain user service recommendations, and enhance platform impact. At the policy level, the platform strives

to secure relevant preprint policies from the Chinese Academy of Sciences and national ministries, organizes major national preprint platform projects, and collaborates with academic societies and the China Association for Science and Technology to raise academic awareness of preprints and build a national-level preprint platform.

The three-dimensional promotion model is illustrated in Figure 3 [Figure 3: see original paper].

### 6.1 Platform Usage

ChinaXiv provides one-stop search and full-text download services. To date, the platform has received 6,689 papers, with 3,964 papers approved for publication, primarily distributed across physics, biology, materials science, and earth sciences. Physics accounts for 1,548 papers (39% of the total), while biology comprises 882 papers (22.2%). The platform has accumulated 43,841 user visits, with 2,449 registered researchers submitting papers. Within the Chinese Academy of Sciences, 54 institutes including the Institute of Computing Technology, Institute of Botany, National Astronomical Observatories, Suzhou Institute of Nano-Tech and Nano-Bionics, and Institute of Psychology have submitted papers. Externally, researchers from 242 institutions have accessed and submitted papers to ChinaXiv, including institutions such as Cape Peninsula University of Technology in South Africa, Duke University, State University of New York, and Lawrence Berkeley National Laboratory. To date, the platform has recorded 126,197 total views and 62,208 downloads, significantly improving the discoverability and citation potential of preprint papers.

### 6.2 Cooperation Progress

After more than a year of development, 15 institutes including the Institute of High Energy Physics, Institute of Theoretical Physics, National Space Science Center, Institute of Computing Technology, Institute of Botany, and Institute of Biophysics have formally joined ChinaXiv construction through sub-projects. Cooperative journals include 11 titles such as *Bulletin of Chinese Academy of Sciences*, *Acta Metallurgica Sinica*, *Acta Ecologica Sinica*, *Journal of Engineering Thermophysics*, *China Biotechnology*, and *Vertebrata Palasiatica*. During promotion and cooperation, regular exchange meetings are organized to enable partner institutes and journals to share experiences and foster collaborative development mechanisms. The distribution of papers across domains is shown in Figure 4 [Figure 4: see original paper].

## 7 Future Development

Through the joint efforts of the project team, partner institutes, cooperative journals, and academic societies, ChinaXiv has achieved certain results. The next phase will focus on the following aspects: (1) Actively exploring sustainable development mechanisms by strengthening cooperation with journals to achieve

organic integration and association of journal resources and preprints, while expanding collaboration with academic societies and universities to broaden service scope and enhance researcher awareness of preprints. Additionally, through useful platforms, simple systems, and quality services, ChinaXiv will gradually become a widely recognized, authoritative new academic exchange platform with international influence, highlighting its role in the global research ecosystem and securing public funding support by addressing national and institutional strategic needs. (2) Building upon ChinaXiv, the project will also 致力于建设中国科学院科技论文 Grid、GoOA and iAuthor platforms to create an open access platform for Chinese Academy of Sciences papers, supporting open access to domestic preprints, open access papers from Academy journals, papers by Chinese scientists published abroad, important open research outputs from institutional repositories, and high-quality open access journals from abroad, while building a scientific social platform to provide convenient communication and sharing services among researchers.

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

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