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Blue Book on China's Scientific Journal Development (2024)

Advancing High-Quality Development of Chinese-Language Scientific Journals

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The Blue Book on China's Scientific Journals Development (2024) is focused on the theme of Advancing High-Quality Development of Chinese-Language Scientific Journals. *The Blue Book 2024* leverages authoritative domestic and international databases alongside primary official data to conduct a scientometric analysis of China's scientific journals and research publications. It identifies existing problems, delineates developmental patterns, and presents a comprehensive assessment of China's scholarly publishing landscape through empirical evidence. Building on extensive field research, *the Blue Book 2024* examines the operational ecosystems and innovative publishing models of Chinese-language scientific journals. Incorporating insights from the successful journal development practices of non-English speaking countries, it proposes actionable strategies to enhance the quality and global relevance of Chinese scientific periodicals. *The Blue Book 2024* intends to strengthen editorial confidence in Chinese-language scientific journal publishing, safeguard China's intellectual property in original research, and position Chinese scientific journals at the forefront of international academic discourse.

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Expert Committee

Blue Book on China's Scientific Journal Development 2024

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Deputy Director: Jianlin CAO

Committee members: (in alphabetical order by last name)

Fahu CHEN, Jianfeng CHEN, Xuedong CHEN, Erdan DONG, Jun LI, Xiwen LIU, Xingping LIU, Bin PENG, Shulin WU, Yaxiang YUAN

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Blue Book on China's Scientific Journal Development 2024

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Blue Book on China's Scientific Journal Development 2024

Group leader: Bin PENG

Deputy group leader: Yanhong HUANG, Peiyi LIU

Group members: (in alphabetical order by last name)
Shuangshuang GAI, Rong LIU, Xiaomin LIU, Na MA, Xiukun SUN, Ruiqiang TIAN, Man WANG, Zhi WANG, Yanqin WENG, Aitong WU, Junhong WU, Yue XIAO, Ruijuan YAN, Daiqing YANG, Zhenglu YU, Tao ZHANG, Xinyu ZHENG, Yingzhi ZHOU

Translator
Lu WANG, Xin LI, Buqing NA, Boya SHEN, Jiayue YU, Yi ZHANG

Reviewer
Mark GARLINGHOUSE

Secretariat
Rong LIU, Liying LIU, Min SHI, Tianyi ZHU, Ruobing XU

Preface

Chinese-language scientific journals, which primarily cater to the needs of domestic science researchers, are a vital channel for publishing China's scientific and technological output, in terms of facilitating the dissemination and communication of scientific research results, discipline construction, talent cultivation, and the commercialization of scientific research achievements.

The Guidelines on Deepening Reforms and Fostering World-class Scientific and Technical Journals, jointly issued by China Association for Science and Technology (CAST), the Publicity Department, the Ministry of Education, and the Ministry of Science and Technology, set the goals that by 2035, China's scientific journals will rank among the world's top tier in terms of overall strength. To achieve this goal, it is essential to develop flagship English-language STM journals that engage with the global scientific frontier, participate in international exchanges, and enhance our international discourse power. At the same time, it is equally important to build a matrix of Chinese-language STM journals that serve domestic scientific innovations as well as economic and social development. This dual approach will help connect the Domestic-International Dual Circulation and provide a platform to accelerate the attainment of high-level scientific and technological self-reliance and self-improvement. The document also points out the direction for the development of Chinese-language scientific journals: "Strengthen the professional orientation and enhance the quality of Chinese-language scientific journals. Develop high-level, high-quality discipline-based and comprehensive journals to support the advancement of related fields and industries. Clarify the positioning of engineering and technology journals and promote differentiated and distinctive development. Expand the international promotion of leading Chinese-language journals and papers to continuously increase their global influence. Through specialized capacity-building, comprehensively enhance the capacity of Chinese scientific journals to serve economic and social development." China has already incorporated open science into its national strategic agenda. As an essential component of the open science system, scientific journals must implement this initiative, promote international cooperation in scholarly publishing, and facilitate the global outreach of China's scientific journals. This will help expand their international dissemination and enhance their global influence.

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Asia, including China, has been playing an increasingly active role in contributing to global scientific advancement, with scholars from Asia authoring more than one-third of the global research output. However, the world's top scientific journals remain concentrated outside Asia. There is a geographic mismatch between the producers of scientific and technological achievements and the channels through which these achievements are disseminated. The development of China's scientific journals is also not aligned with the pace of the country's scientific and technological progress. Over the past forty years of reform and opening up, China's scientific and technological development has progressed from tracking and imitation to catching up, and in some fields has even reached the stage of running alongside or taking the lead. However, the development of China's scientific journals has lagged behind this progress. In 2023, authors from China published 728 700 SCI-Indexed articles, accounting for approximately one-third of the global total of SCI articles. However, China hosts only 240 SCI-indexed journals, which published just 33 400 articles by domestic authors, accounting for less than 5% of SCI publications from authors in China. Consequently, about 95% of China's high-impact research papers are published in international English-language journals. The journal publishing and dissemination platforms that support China's scientific and technological innovation are controlled by external entities. This has led to a serious "both ends abroad" problem, which, in addition to causing significant spending on subscriptions to international journals, poses a grave risk to data security.

Science knows no borders, yet technology is patented; scientists have their homeland, but nations compete. On one hand, scientists need to publish their papers in the world's top-tier scientific journals, participate in global exchanges and competition, and contribute to the progress of human civilization. On the other hand, while pursuing knowledge and truth, science must focus on serving the interests of national socioeconomic growth and the livelihood of the general public. This aligns with the mission of Chinese-language scientific journals, which possess inherent advantages in language and resources for fulfilling this purpose. For example, there are over 2000 Chinese-language journals in the fields of engineering and technology, reflecting the integration of science and technology with the economy. Many of these are run by enterprises, addressing practical problems encountered in enterprises' production processes. Enhancing the quality of these journals plays a crucial role in driving enterprise technological innovation. Currently, China boasts over 110 million scientific and technological workers, retaining its position as the world's largest science and technology human resource pool. Grassroots scientific workers primarily read Chinese-language literature. According to research, 95.9% of scientific workers read Chinese scientific journals weekly, which is 11.44% higher than those who read English journals weekly. This represents a significant opportunity for Chinese-language scientific journals to disseminate results to domestic researchers.

Chinese-language scientific journals form the backbone of China's scientific journals. From the founding of New China through the early reform and opening-up period, they played a pivotal role in advancing the nation's scientific innovation. Landmark achievements etched in China's scientific history were predominantly first published in these journals, including, for example, the total synthesis of crystalline bovine insulin, Jingrun CHEN's work on "Goldbach's Conjecture", Youyou TU's discovery of the "artemisinin structure", Longping YUAN's research on "male sterility in rice", Zhongxian ZHAO's breakthroughs in "high-temperature superconductivity", Yingbin TANG's

"12 000-ton hydraulic press", and so on. In recent years, the domestic academic influence of Chinese-language scientific journals has steadily increased. By the end of 2023, China had 5211 scientific journals, with Chinese-language journals constituting the vast majority (4556 titles, 87.43%). Based on the statistics from CNKI's *Annual Report for Chinese Academic Journal Impact Factors* (2022–2024 editions, covering data during 2021–2023), 3589 Chinese scientific journals were reported in 2023, and the total composite citations reached 9.7793 million—a 4.28% increase from 2021. The average total composite citations per journal rose to 2726.31, increasing 3.03% from 2021. The average composite impact factor climbed to 1.234, up by 9.69% from 2021. All metrics demonstrate sustained upward trajectories.

While Chinese scientific journals have made progress, they still face many difficulties and challenges. In terms of the development environment, due to the excessive emphasis on academic metrics such as impact factors in research evaluation and in incentive policies, researchers are more inclined to publish their high-level research results in high-impact international English-language journals. This has resulted in a shortage of high-quality manuscripts of Chinese scientific journals. From a demand perspective, Chinese-language scientific journals face issues such as a disconnect from the needs of high-tech enterprises and insufficient integration with actual production requirements. From the perspective of self-development, Chinese-language scientific journals suffer from problems including homogenization in publishing, uneven quality, limited international influence, low levels of intensification and marketization, and slow platform development. Additionally, with advances in AI technology and open science, China's scientific journals are encountering new opportunities and challenges.

In recent years, a growing consensus among experts and scholars has recognized the profound significance, critical importance, and urgency of enhancing Chinese-language scientific journals. This has reignited confidence in developing these publications, with researchers actively engaging in journal-related initiatives and publishing their work therein. Accordingly, the *Blue Book on China's Scientific Journals Development (2024)* focuses on "advancing high-quality development of Chinese-language scientific journals." The expert committee affirmed this thematic direction, emphasizing that journal development must be approached from a standpoint of cultural confidence. This requires increasing support for such journals, further deepening institutional and mechanism reforms, establishing an independent evaluation system for Chinese scientific journals, prioritizing the construction of proprietary databases, and actively exploring paths toward cluster-based and group-oriented development. Additionally, efforts should be made to guide Chinese scientific journals to publish applied research from China's leading industries, highlight Chinese characteristics, effectively tell China's stories, and enhance their capacity to serve the broader community of scientists and technicians. At the same time, technologies such as AI should be fully leveraged to break down language barriers, attract international readers, and achieve the goal of "going global."

The Blue Book on China's Scientific Journals Development (2024) further clarifies the unique mission and responsibilities shouldered by Chinese-language scientific journals, and strengthens confidence in their development. Through in-depth research, data analysis, and case studies, it objectively presents the current development state of Chinese-language scientific journals, analyzes the underlying causes of their slow progress, summarizes practical explorations of operational models, draws on the development experiences of local

journals from non-English-speaking countries, and proposes actionable development strategies and recommendations for advancement.

The Compilation Committee integrates research expertise from scientific societies, publishing houses, academic institutions, and regulatory bodies, including: Science Press, China Periodicals Association, Institute of Scientific and Technical Information of China, National Science Library CAS, Society of China University Journals, Beijing Zhongke Journal Publishing, KeAi Publishing, Science China Press, CNKI, Chinese Medical Association Publishing House, Beijing Prominion Publishing, Zhejiang University Press, Central South University Press, Shandong University Science Journals Press, and Service Center for Societies of CAST. With substantial support from the Expert Committee and the Compilation Committee, the compilation team adhered to the principles of objectivity and impartiality in conducting evidence-based data collection, literature retrieval, case screening, problem diagnosis, trend analysis, and pattern identification. Through meticulous analysis of extensive datasets and references, this work comprehensively documents the current state of Chinese scientific journals and research publications and explores viable pathways to advance the high-quality development of Chinese-language scientific journals.

We hereby express sincere gratitude to all experts, scholars, and industry colleagues whose dedicated efforts contributed to the compilation and publication of this Blue Book. We also extend our heartfelt thanks to all institutions and individuals who provided data and publishing services. Given the limitations of the compilers' expertise, oversights and inadequacies in this book are inevitable. We sincerely welcome all readers to share their insights generously and offer valuable feedback and critiques for improvement. Thank you!

Service Center for Societies of CAST
December 2024

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Chapter 1

General Information about China's Scientific Journals

Peiyi LIU, Yingzhi ZHOU, Man WANG, Zhi WANG, Rong LIU, Zhenglu YU, Shuangshuang GAI and Ruiqiang TIAN

Abstract

Current Situation of China's Scientific Journals

General Features of China's Scientific Journals

According to the National Journal Annual Inspection Report 2023 from the National Press & Publication Administration (NPPA), there were 5211 scientific journals published in China at the end of 2023. The report notes the following general features of the journals: (A) The distribution of scientific journals across regions shows disparities, with Beijing ranking first (1718, 32.97%), followed by Shanghai (363, 6.97%), Jiangsu (266, 5.10%), Hubei (224, 4.30%), and Sichuan (216, 4.15%). Each of the top five regions has published more than 200 scientific journals. (B) Publication frequency is dominated by bi-monthly (2046, 39.26%) and monthly journals (1859, 35.67%), comprising three-quarters of the total. (C) Chinese-language journals (4556, 87.43%) accounted for the vast majority of the publications, while there were 479 English-language journals (9.19%) and 176 Chinese-English journals (3.38%). (D) Disciplinary distribution included 1596 journals (30.63%) in basic science, 2288 (43.91%) in technology and science, and 1169 (22.43%) in medicine and health.

Distribution of Supervising, Sponsoring, and Publishing Organizations

The supervision, sponsorship, and publication of STM journals in China were somewhat scattered, with most publishing units operating as single-journal editorial offices. (A) There were 1314 supervising organizations, each supervising an average of 3.97 journals. Among them, 865 organizations (65.83%) managed only one journal, while 76 (5.78%) managed over 10 journals. (B) Statistics reveal that 3217 primary sponsoring organizations hosted an average of 1.62 journals each. Of these, 2473 (76.87%) hosted only one journal, while just 35 (1.09%) organizations sponsored over 10 journals. (C) There were 4470 publishing organizations, each publishing 1.17 journals on average. 4293 organizations

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published only one journal (96.04%) and 3500 (78.30%) were single-journal editorial offices. Only 11 publishing organizations published over 10 journals each (0.25%).

Steady Growth in Scientific Journal Personnel

China's scientific journal industry employed a total of 37 626 professionals. Permanent staff comprised 64.26% of the workforce, with editorial personnel representing the largest subgroup (61.13%). Educational background varied by journal type. The majority of staff working on Chinese-language journals held a bachelor's degree (43.91%), whereas those working on English-language journals predominantly held a master's degree (41.59%). In terms of professional titles, the majority hold intermediate professional titles or above (accounting for 71.54%).

Academic Influence of China's Scientific Journals

According to data from the *China Scientific and Technical Papers and Citations Report* by the Institute of Scientific and Technical Information of China, the total citation frequency and impact factor of China's scientific journals have been consistently rising over the decade from 2013 to 2022. In 2022, the average total citation frequency was 1683, compared to 1180 in 2013, with an average annual growth rate of 4.02%. The average impact factor in 2022 was 1.048, up from 0.523 in 2013, with an average annual growth rate of 8.03%. China's core scientific journals are predominantly distributed in the fields of engineering technology and medicine.

According to data from the *2023 Edition of China's English-Language STM Journals Citation Report* by the Institute of Scientific and Technical Information of China, 90.97% of China's English-language scientific journals are distributed across three major fields: engineering technology, natural sciences, and medicine. The proportions of English-language journals in these fields account for 40.53%, 29.07%, and 21.37% of the total, respectively. The number of articles in China's English-language scientific journals has increased, with the average number of source documents from English-language scientific journals reaching 101.23 in 2022, representing a 3.27% increase compared to 2021. The academic influence indicators of China's English-language scientific journals have shown an upward trend. In 2022, the average total citation frequency for these journals was 617.34, showing a 10.37% increase compared to 2021. The average impact factor was 0.717, up by 15.83% from 2021, and the average immediacy index was 0.162, representing a 35.00% increase over 2021. With the rapid development of science and technology in China, the international academic exchange status and role of China's scientific journals are becoming increasingly prominent, with a growing number of journals being included in internationally renowned databases.

1.1 Analysis of Current Situation of China's Scientific Journals

The analysis in this book is based on the data from the 2023 National Journal Annual Inspection (2023 Annual Inspection hereafter), using the China Serial Number (CN) classification to identify a core dataset of 5160 Chinese scientific journals. It incorporated information on journals established from 2018 to 2023, as well as title changes and

cancellations from 2016 to 2023. This data was then cross-referenced with the *Blue Book of China's Scientific Journals* (2017–2023). According to incomplete statistics, the total number of Chinese scientific journals reached 5211 by the end of 2023[1]. Among these, 43 new scientific journals were launched in China in 2023 (42 in English and 1 in both Chinese and English)[2], while 12 scientific journals were deregistered (all in Chinese)[3].

1.1.1 Basic Facts of Journals

1.1.1.1 Uneven Distribution of Scientific Journals Across China

The number of scientific journals published in different regions across China is unevenly distributed. Analysis of 5211 Chinese scientific journals shows: Beijing ranked first (1718 journals, 32.97% of all journals); Shanghai (363 journals, 6.97%), Jiangsu (266 journals, 5.10%), Hubei (224 journals, 4.30%), and Sichuan (216 journals, 4.15%). All five regions published over 200 scientific journals each; 12 regions published 100–200 (exclusive) scientific journals each; and 9 regions published 50–100 (exclusive) journals each. To sum up, in terms of distribution by place of publication, five regions published over 200 STM journals each; 17 regions published over 100 STM journals each; and 26 regions published over 50 STM journals each (table 1.1).

1.1.1.2 The Predominant Frequency of China's Scientific Journals: Monthly and Bimonthly

In terms of publication cycles, most of China's scientific journals are monthly or bimonthly, accounting for three-quarters of the total. A statistical analysis of 5211 STM journals based

[1]The statistics of China's scientific journals in this book do not include data on journals that did not participate in the 2023 annual inspection, nor the data on journals in China's Hong Kong SAR, Macao SAR and Taiwan regions.

[2]The list of the 43 newly launched scientific journals in China in 2023 (sorted alphabetically): *Aerospace Systems*, *Advanced Fiber Materials*, *Biomedical Engineering Frontiers*, *Biomedical Engineering Materials*, *Cancer Innovation*, *Cell Regeneration*, *Chain*, *Chip*, *Clinical Traditional Medicine and Pharmacology*, *Communications on Pure and Applied Analysis*, *Current Urology*, *Cyber-Systems and Robotics*, *Data Science and Engineering*, *Ecology Frontiers*, *Electromagnetic Science*, *Energy Storage and Saving*, *Environment and Health*, *Experimental and Computational Multiphase Flow*, *Geohazard Mechanics*, *Guidelines and Standards in Chinese Medicine*, *High-Speed Railway*, *Infection Control*, *International Journal of Intelligent Control and Systems*, *Journal of Neurorestoratology*, *Journal of Information and Intelligence*, *Mycology*, *Nano Biomedicine and Engineering*, *Nano Research Energy*, *National Park* (*bilingual in Chinese and English*), *Plant Communications*, *Propulsion and Power Research*, *Quantum Frontiers*, *SmartMat*, *Materials Genome Engineering Advances*, *Seed Biology*, *Science of Traditional Chinese Medicine*, *Superconductivity*, *Transactions on High Performance Computing*, *Transactions on Pervasive Computing and Interaction*, *Visual Informatics*, *Visual Intelligence*, *Water Biology and Security*, and *Zoological Research: Diversity and Conservation*.

[3]The list of the 12 scientific journals which were deregistered in China in 2023 (sorted alphabetically): *China Internet*, *China Timber*, *Chinese Journal of Health Laboratory Technology*, *Computer Paradise*, *Decoration & Renovation World*, *Electronic Paradise*, *Electroplating & Pollution Control*, *International Fashion Trends*, *Green and Eco-friendly Building Materials*, *Modern Telecommunications Science & Technology*, *Scientific Health Preservation*, and *World Telecommunications*. The reason for cancellation is that these journals have long failed to publish regularly and no longer meet the conditions for publication.

Tab. 1.1 – Distribution of scientific journals across China in 2023 (by region) (Unit: no. of journals).

Serial No.	Region	Yearly	Semi-yearly	Quarterly	Bi-monthly	Monthly	Semi-monthly	Ten-day	Weekly	Bi-weekly	Total
1	Beijing	28	5	210	502	782	151	31	6	3	1718
2	Shanghai	1	3	56	172	119	9	3	0	0	363
3	Jiangsu	1	1	48	135	67	10	2	1	1	266
4	Hubei	3	1	21	101	79	16	3	0	0	224
5	Sichuan	0	0	44	87	76	4	4	1	0	216
6	Guangdong	0	1	21	79	66	23	3	0	0	193
7	Liaoning	1	0	14	92	67	4	4	0	0	182
8	Heilongjiang	1	0	25	67	58	9	3	1	0	164
9	Shaanxi	0	1	22	74	54	9	2	1	0	163
10	Tianjin	1	1	15	59	55	10	1	0	0	142
11	Shandong	0	0	31	64	39	3	2	0	0	139
12	Hunan	0	0	23	64	42	4	4	0	0	137
13	Zhejiang	0	0	36	56	39	4	0	0	0	135
14	Henan	2	0	21	54	36	10	2	2	0	127
15	Hebei	0	1	15	40	33	13	6	1	0	109
16	Anhui	1	0	18	53	28	4	1	0	0	105
17	Jilin	0	0	19	36	31	12	5	1	0	104
18	Shanxi	0	0	15	34	26	10	5	0	0	90
19	Chongqing	0	0	5	26	31	15	2	1	0	80
20	Fujian	0	3	20	31	22	0	0	0	0	76
21	Guangxi	2	0	14	34	21	2	1	2	0	76
22	Jiangxi	0	0	15	34	17	7	0	0	0	73
23	Gansu	0	0	8	41	13	3	0	0	0	65
24	Xinjiang	1	4	23	25	6	0	0	0	0	59
25	Yunnan	0	0	7	26	16	3	4	0	0	56
26	Inner Mongolia	0	2	7	24	14	1	1	2	0	51
27	Guizhou	0	0	6	21	10	1	0	0	0	38
28	Qinghai	0	0	13	5	1	0	0	0	0	19

Tab. 1.1 – (continued).

Serial No.	Region	Yearly	Semi-yearly	Quarterly	Bi-monthly	Monthly	Semi-monthly	Ten-day	Weekly	Bi-weekly	Total
29	Hainan	0	0	4	1	5	3	1	0	0	14
30	Ningxia	0	0	3	2	6	0	0	0	0	11
31	Xizang	0	1	5	3	0	0	0	0	0	9
32	Xinjiang Production & Construction Corps (XPCC)	0	1	2	4	0	0	0	0	0	7
Total		42	25	786	2046	1859	340	90	19	4	5211

Note: 1. Ranked in descending order based on the number of journals.

2. Based on statistics on reporting units from the national journal's annual inspection, the number of XPCC was counted separately.

3. The statistics of China's scientific journals in this book do not include data on journals that did not participate in the 2023 annual inspection, nor the data on journals in China's Hong Kong SAR, Macao SAR and Taiwan regions. The same applies to all subsequent tables.

Tab. 1.2 – Distribution of publication cycles for 5211 Chinese scientific journals in 2023.

Frequency	No. of journals	%	Frequency	No. of journals	%
Bi-monthly	2046	39.26	Yearly	42	0.81
Monthly	1859	35.67	Semi-yearly	25	0.48
Quarterly	786	15.08	Weekly	19	0.36
Semi-monthly	340	6.52	Semi-weekly	4	0.08
Ten-day	90	1.73	Total	5211	100.00

Note: Ranked in descending order based on the number of journals.
Due to the application of rounding rules, the aggregated data presented in the statistical tables of this book may slightly differ from the results obtained through actual calculations. The same applies to all subsequent tables.

on their publication cycles (tables 1.1 and 1.2) shows that the top three categories in terms of journal frequency are bimonthly journals (2046 titles, 39.26%), monthly journals (1859 titles, 35.67%), and quarterly journals (786 titles, 15.08%). Among them, bimonthly and monthly journals together accounted for 74.93% of all journals (3905). Comparing the distribution of publication cycles across different regions, monthly journals have the highest proportion in Beijing, Chongqing, Hainan, and Ningxia; quarterly journals account for the largest share in Qinghai and Xizang; while in the remaining provinces, autonomous regions, and municipalities, bimonthly journals have the highest proportion.

1.1.1.3 Chinese-Language Journals Predominate in China's Scientific Publications

The distribution of languages in China's scientific journals shows that Chinese-language journals constitute the vast majority. Among the 5211 scientific journals, there are 4556 Chinese-language journals, accounting for 87.43%; 479 English-language journals, accounting for 9.19%; and 176 bilingual Chinese-English journals, accounting for 3.38% (table 1.3).

The disciplinary distribution of Chinese-language scientific journals is primarily concentrated in General Industrial Technology (1704 journals, 37.40%), Medicine and Health (1007 journals, 22.10%), Agriculture and Forestry (506 journals, 11.11%), and General Natural Sciences (433 journals, 9.50%). English-language scientific journals are mainly distributed in General Industrial Technology (138 journals, 28.81%), Medicine and Health (109 journals, 22.76%), and Mathematics, Physics, and Chemistry (71 journals, 14.82%). Bilingual Chinese-English journals are predominantly found in General Industrial Technology (43 journals, 24.43%) and Medicine and Health (53 journals, 30.11%) (table 1.3).

From the overall disciplinary distribution of China's 5211 scientific journals, there are 1596 journals in basic sciences, accounting for 30.63%, including General Natural Sciences (473), Mathematics, Physics, and Chemistry (218), Astronomy and Geosciences (249), Biological Sciences (118), and Agriculture and Forestry (538); 2288 journals in technical sciences, accounting for 43.91%, including General Industrial Technology (1885), Transportation (224), Aeronautics and Astronautics (81), and Environmental Science and Safety Science (98); 1169 journals in medical and health sciences, accounting for 22.43%; and 158 journals in multidisciplinary sciences, accounting for 3.03% (table 1.3).

Tab. 1.3 – Distribution of China's 5211 scientific journals by language and discipline (2023) (Unit: no. of journals).

Category	Discipline	Chinese	English	Chinese-English	Total
Basic Sciences (1596)	N General Natural Science	433	24	16	473
	O Mathematical, Physical & Chemistry	132	71	15	218
	P Astronomy, Geosciences	199	40	10	249
	Q Biological Science	64	45	9	118
	S Agriculture, Forestry	506	21	11	538
Technical Science (2288)	T General Industrial Technology	1704	138	43	1885
	U Transportation	206	9	9	224
	V Aeronautics, Astronautics	68	8	5	81
	X Environmental Science, Safety Science	82	13	3	98
Medicine & Health (1169)	R Medicine, Health, Comprehensive Medicine & Health	1007	109	53	1169
Multidisciplinary Science (158)	Z Comprehensive Science	155	1	2	158
	Total	4556	479	176	5211

1.1.1.4 The Fragmented Distribution of Supervising, Sponsoring, and Publishing Organizations of China's Scientific Journals

The supervising, sponsoring, and publishing organizations of China's scientific journals are scattered, with most publishing organizations being the editorial offices of a single journal. According to statistics, 5211 scientific journals in China had 1314 supervising organizations in total, which means each organization managed 3.97 journals on average. 865 organizations (65.83%) only managed one journal each; 199 organizations (15.14%) managed two journals each; and 174 organizations (13.24%) managed three to nine journals each. 76 organizations (5.78%) managed over 10 journals each. The top 10 supervising organizations of scientific journals, ranked by the number of journals, were: CAST (503 journals), the Ministry of Education (484 journals), CAS (309 journals), National Health Commission (214 journals), Ministry of Agriculture and Rural Affairs (92 journals), Ministry of Industry and Information Technology (68 journals), China Machinery Industry Federation (66 journals), Jiangsu Education Department (58 journals), China National Light Industry Council (45 journals) and China Electronics Technology Group Corporation (42 journals).

Based on statistics for the first sponsoring organization, 5211 scientific journals in China had 3217 sponsoring organizations, each organization sponsoring 1.62 journals on

average. 2473 organizations (76.87% of all) hosted only one journal each, 410 organizations (12.74%) hosted two journals each, and 299 organizations (9.29%) hosted three to nine journals. 35 organizations (1.09%) hosted 10 (and above) journals each. The top 10 sponsoring organizations of scientific journals, ranked by the number of journals, were: Chinese Medical Association (CMA) (154 journals), Chinese Preventive Medicine Association (CPMA) (33 journals), Chinese Medical Doctor Association (CMDA) (30 journals), Zhejiang University (27 journals), Tsinghua University (25 journals), Shanghai Jiao Tong University (21 journals), China Science Publishing & Media (20 journals), CAS (20 journals, only including journals that had CAS as the sponsoring organization, excluding those hosted by subordinate institutions), Chinese Academy of Medical Sciences (CAMS) (19 journals), Beijing Prominion Publishing (19 journals) and Higher Education Press (19 journals).

The 5211 scientific journals in China were published by 4470 organizations, with an average of 1.17 journals per organization. 4293 organizations (96.04% of all) published only one journal each. 3500 publishing organizations were the editorial office of a single journal, accounting for 78.30% of the total. 101 organizations (2.26%) published two journals each, and 65 organizations (1.45%) published three to nine journals. 11 organizations (0.25%) published 10 (and above) journals each. The top 10 publishing organizations, ranked by the number of journals published, were: Chinese Medical Journal (Chinese Medical Association Publishing House, 148 journals), China Science Publishing & Media (Science Press, 146 journals), Tsinghua University Publishing House (26 journals), Higher Education Press (21 journals), Zhejiang University Publishing House (21 journals), Beijing Prominion Publishing (20 journals), Science China Press (19 journals), China Railway Publishing House (13 journals), Boyuan Publishing (12 journals), and Shanghai Jiao Tong University (11 journals).

1.1.2 Human Resources

1.1.2.1 The Workforce in China's Scientific Journals Shows Consistent Growth

Among the 5160 scientific journals that participated in the 2023 annual journal inspection, 5056 journals reported personnel information. Statistical findings (table 1.4) reveal that China's scientific journal workforce totaled 37 626 personnel. There were 1234 journals with four or fewer staff members, accounting for 24.41% of all the journals; 2876 journals (56.88%) with five to nine staff members; and 946 journals (18.71%) with 10 or more staff members. Compared to the total number of personnel working in scientific journals in the previous two years (36 806 in 2021 and 36 974 in 2022), there was a steady increase in 2023.

1.1.2.2 China's Scientific Journal Personnel Analysis: Permanent and Non-Permanent Staff

The majority of personnel at China's scientific journals are permanent staff. According to the 2023 annual inspection data, there were 24 177 (64.26%) permanent staff and 13 449 non-permanent (35.74%) staff working for China's scientific journals. The statistics show that a total of 9 regions employed over 1000 professionals, with Beijing having the largest

Tab. 1.4 – China's scientific journal workforce by region (2023).

Serial No.	Region	Total personnel	Permanent staff		Non-permanent staff	
			Headcount	%	Headcount	%
1	Beijing	12 620	6603	52.32	6017	47.68
2	Shanghai	2650	1797	67.81	853	32.19
3	Jiangsu	1829	1329	72.66	500	27.34
4	Guangdong	1581	818	51.74	763	48.26
5	Hubei	1485	1003	67.54	482	32.46
6	Sichuan	1446	996	68.88	450	31.12
7	Shaanxi	1220	871	71.39	349	28.61
8	Heilongjiang	1160	909	78.36	251	21.64
9	Liaoning	1143	902	78.92	241	21.08
10	Henan	991	777	78.41	214	21.59
11	Tianjin	961	848	88.24	113	11.76
12	Shandong	949	776	81.77	173	18.23
13	Hunan	917	609	66.41	308	33.59
14	Hebei	878	556	63.33	322	36.67
15	Chongqing	868	523	60.25	345	39.75
16	Anhui	852	550	64.55	302	35.45
17	Zhejiang	840	594	70.71	246	29.29
18	Shanxi	825	588	71.27	237	28.73
19	Guangxi	693	373	53.82	320	46.18
20	Jilin	682	492	72.14	190	27.86
21	Jiangxi	519	388	74.76	131	25.24
22	Fujian	465	348	74.84	117	25.16
23	Gansu	422	312	73.93	110	26.07
24	Yunnan	368	257	69.84	111	30.16
25	Inner Mongolia	338	232	68.64	106	31.36
26	Xinjiang	309	273	88.35	36	11.65
27	Guizhou	251	191	76.10	60	23.90
28	Hainan	112	56	50.00	56	50.00
29	Qinghai	95	76	80.00	19	20.00
30	Ningxia	58	42	72.41	16	27.59
31	Xizang	57	50	87.72	7	12.28
32	XPCC	42	38	90.48	4	9.52
Total		37 626	24 177	64.26	13 449	35.74

Note: Ranked in descending order of total workforce headcount.
Among 5160 journals that reported data in 2023, 104 journals did not report, hence there were 5056 valid data left.

workforce at 12 620 people (33.54% of the national total). Among 32 provincial-level regions and XPCC, 28 regions reported over 60% permanent staff, with the highest proportion reaching 88.35% and the lowest at 50.00% (table 1.4). Regarding journal workforce composition, 2050 journals (40.55%) employed exclusively permanent staff, and 349 journals (6.90%) relied solely on contracted personnel. Journals reporting a larger number of personnel had a relatively higher proportion of employed staff. For instance, the *Chinese National Geography* had 95.96% of its staff as contract personnel.

1.1.2.3 Analysis of Personnel Composition of China's Scientific Journals

The workforce of China's scientific journal is predominantly composed of editorial and publishing staff. According to the annual inspection data, scientific journal personnel include acquisition editors, new media specialists, administrative personnel, advertisement staff, distribution team, and other supporting roles. According to statistics, editorial staff normally are responsible for topic selection, paper commissioning and processing, accounting for 61.13% of the scientific journal workforce. Administrative staff, primarily responsible for the daily management of editorial offices, accounted for 11.65%. The distribution team, primarily engaged in marketing and promotion, accounted for 7.21%. New media specialists focused on academic content outreach, represent 6.04% while advertising staff, dedicated to advertising operations, make up 5.06%. Currently, these two types account for a relatively small proportion of the total personnel, which is detrimental to the operation and dissemination of journals and urgently requires improvement (table 1.5). The number of editorial staff in journals is predominantly concentrated in the range of two to five individuals (3647 journals, accounting for 72.13%).

1.1.2.4 Academic Background Analysis of China's Scientific Journal Personnel

The majority of China's Chinese-language scientific journal personnel have undergraduate degrees. The majority of English-language scientific journal personnel have master's degrees. Based on statistics (table 1.6), Chinese-language journals have the largest workforce, with 33 937 individuals, accounting for 90.27% of the total. Among the employees of Chinese-language journals, bachelor's degree holders form the largest educational cohort (14 901 individuals, 43.91%). In contrast, English-language journals employ 2419 individuals, with master's or above constituting the highest proportion (1006 individuals, 41.59%).

1.1.2.5 Analysis of Professional Titles of China's Scientific Journal Personnel

Among the 5160 journals that participated in the 2023 annual inspection, 5053 journals provided information on the personnel's professional titles. The statistics show that 26 888 people (71.54% of all personnel) had intermediate professional titles and above, among which 16 372 people (43.56%) had senior professional titles (table 1.7).

Tab. 1.5 – Personnel composition of China's scientific journals 2023.

Personnel composition	Mandarin journal		English journal		Chi-Eng journal		Total	
	Headcount	%	Headcount	%	Headcount	%	Headcount	%
Editorial	20 654	60.81	1578	65.23	767	61.85	22 999	61.13
New media	2017	5.94	179	7.40	75	6.05	2271	6.04
Administrative	4023	11.84	227	9.38	135	10.89	4385	11.65
Advertisement	1818	5.35	39	1.61	46	3.71	1903	5.06
Distribution	2505	7.37	129	5.33	77	6.21	2711	7.21
Others	2950	8.68	267	11.04	140	11.29	3357	8.92
Total	33 967	100.00	2419	100.00	1240	100.00	37 626	100.00

Note: Among 5160 journals that reported data for the 2023 annual inspection, 104 journals did not report, hence there were 5056 valid data left.

Tab. 1.6 – Academic background of China's scientific journal personnel in 2023.

Academic background	Mandarin journal		English journal		Chi-Eng journal		Total	
	Staff No.	%	Staff No.	%	Staff No.	%	Staff No.	%
Ph.D.	4958	14.61	955	39.48	300	24.19	6213	16.53
Master's	11 055	32.58	1006	41.59	439	35.40	12 500	33.25
Bachelor's	14 901	43.91	380	15.71	399	32.18	15 680	41.71
College degree and under	3023	8.91	78	3.22	102	8.23	3203	8.52
Total	33 937	100.00	2419	100.00	1240	100.00	37 596	100.00

Note: Among 5160 journals that reported data for the 2023 annual inspection, 105 journals did not report, hence there were 5055 valid data left.

Tab. 1.7 – Professional titles of China's scientific journal personnel in 2023.

Professional title	Headcount	%
Senior	7779	20.70
Associate senior	8593	22.86
Intermediate	10 516	27.98
Junior and under	10 694	28.46
Total	37 582	100.00

Note: Among 5160 journals that reported data for the 2023 annual inspection, 107 journals did not report, hence there were 5053 valid data left.

1.2 Impact Analysis of China's Scientific Journals

Based on the *Chinese S&T Journal Citation Reports (Natural Science) 2023* (short for CSTJC Reports)[4] (based on 2022 data) and the *Chinese English S&T Journal Citation Reports*[5] *2023* (based on 2022 data) by the Institute of Scientific and Technical Information of China (hereafter ISTIC), this section assesses the domestic and global impact profiles of Chinese scientific journals.

1.2.1 Impact Analysis of China's Core Scientific Journals

According to data from the *Chinese S&T Journal Citation Reports*, both the total cited frequency and impact factors of China's scientific journals showed consistent increases over the decade from 2013 to 2022. The average number of total cited times in 2022 reached 1683, rising from 1180 in 2013, representing an average annual increase of 4.02%. Concurrently, the average impact factor climbed to 1.048 in 2022 compared to 0.523 in 2013, achieving an average annual growth rate of 8.03% (figure 1.1).

[4]The Chinese S&T Journal Citation Reports, a specialized retrieval and evaluation tool for journal citation analysis, has been published annually since 1997. It selects China's core scientific journals (also known as Statistical Source Journals for Chinese S&T Papers) based on comprehensive quantitative and qualitative criteria, representing leading journals across all scientific disciplines. Articles published in these core journals form the Chinese Science and Technology Paper Citation Database (CSTPCD). Statistical outcomes from CSTPCD are incorporated into the China Statistical Yearbook of Science and Technology — jointly compiled by the National Bureau of Statistics and the Ministry of Science and Technology — and are extensively referenced by research management authorities and academic communities. The 2023 edition of CSTPCD indexed 2151 journals in natural sciences and engineering technologies, comprising 1996 Chinese-language and 155 English-language journals.

[5]Chinese English S&T Journal Citation Reports document key academic metrics of English-language STM journals published in China, serving as a vital resource for academia, publishers, and research administrators to evaluate their scholarly standing. The 2023 edition covered 454 English journals. First launched in 2001 by ISTIC, the reports were updated biennially until transitioning to annual publication commencing in 2023.

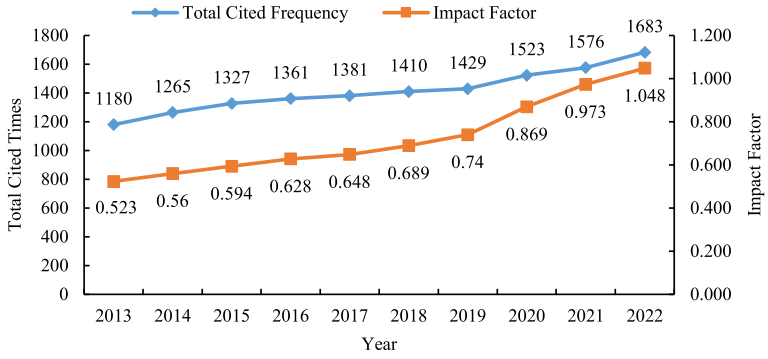


FIG. 1.1 – The changes in total cited frequency and impact factors of China's core scientific journals from 2013 to 2022. Data source: *Chinese S&T Journal Citation Reports (Natural Science) editions* 2014–2023.

1.2.1.1 Dominant Distribution of China's Core STM Journals in Engineering and Medicine

The *Chinese S&T Journal Citation Reports* classifies journals based on the primary subject areas of the papers they publish. Journals covering multidisciplinary or interdisciplinary content are assigned to two or three subject categories. In accordance with the classification principles of the "Classification and Codes of Disciplines" (GB/T 13745–2009) and the *Chinese Library Classification (Fourth Edition)*, and taking into account the actual distribution patterns of China's scientific journals, the source journals are categorized into six major scientific fields and 112 subject categories.

According to the *Chinese S&T Journal Citation Reports* 2023 (based on 2022 data), 208 journals were classified as multidisciplinary, including 201 Chinese-language journals and 7 English-language journals. The top three subject areas with the highest number of journals were Engineering Technology, Medicine, and Science with 905, 770, and 364 journals, respectively (table 1.8). A total of 21 subjects had 30 or more journals. The top three were all university journal categories: university journals in Engineering Technology had 89 journals, accounting for 4.14% of all China's core journals, followed by university journals in natural sciences and university journals in medicine and pharmacy (table 1.9).

1.2.1.2 Analysis of Journal Citation Metrics

1) Total Citations Vary Across Different Disciplines

Total citations, or total cited frequency, refers to the aggregate number of times all articles published in a journal since its inception have been cited during the statistical year. This metric demonstrates the journal's utility, academic recognition, and absolute influence in scientific communication. The *Chinese S&T Journal Citation Reports (Natural Science) 2023* had the citation metrics derived from 2547 natural and social science journals indexed in the Chinese Science and Technology Paper Citation Database (CSTPCD). In 2022, the average total cited frequency for China's core scientific journals in

TAB. 1.8 – Number of China's core STM journals in different disciplines in 2022.

No.	Discipline	No. of Chinese-language journals	No. of English-language journals	Total	Percentage of total natural science journals in CSTJC reports/%
1	Engineering Technology	848	57	905	42.07
2	Medicine	739	31	770	35.80
3	Science	306	58	364	16.92
4	Agronomy	181	10	191	8.88
5	Multidisciplinary Sciences	91	7	98	4.56
6	Management	27	0	27	1.26

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
There are 2151 titles of journals in the Natural Science edition. Interdisciplinary duplication occurs where journals span multiple subject domains. Rank in descending order by total count.

TAB. 1.9 – Disciplinary distribution of China's core scientific journals with over 30 titles in 2022.

No.	Discipline	No. of journals			Percentage of total natural science journals in CSTJC reports/%
		Chinese-language journals	English-language journals	Total	
1	Engineering Technology	86	3	89	4.14
2	Multidisciplinary Sciences	53	4	57	2.65
3	Medicine	55	0	55	2.56
4	Pharmaceutical Sciences	44	4	48	2.23
5	Multidisciplinary Medicine	40	3	43	2.00
6	Aerospace Science & Technology	39	3	42	1.95
7	Petroleum & Natural Gas Engineering	40	1	41	1.91
8	Physics	30	11	41	1.91
9	Chemistry	33	7	40	1.86
10	Agricultural Multidisciplinary	39	1	40	1.86
11	Geology	37	2	39	1.81
12	Clinical Medicine (Multidisciplinary)	38	1	39	1.81

Tab. 1.9 – (continued).

No.	Discipline	No. of journals			Percentage of total natural science journals in CSTJC reports/%
		Chinese-language journals	English-language journals	Total	
13	Electrical Engineering	37	1	38	1.77
14	Environmental & Resource Science Technology	35	3	38	1.77
15	Chemical Engineering (Multidisciplinary)	33	3	36	1.67
16	Computer Science & Technology	31	4	35	1.63
17	Neurology & Psychiatry	32	3	35	1.63
18	Oncology	31	4	35	1.63
19	Architectural Science & Technology	34	0	34	1.58
20	Basic Medical Sciences	30	1	31	1.44
21	Agronomy	31	0	31	1.44

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by total count; for identical counts of different journals, sorted by the Chinese-language journals' title names in their alphabetical ascending order.

the CSTJC Reports' Natural Science edition was 1683 citations. Among disciplines, Management had the highest average with 3002 citations, while Multidisciplinary Sciences had the lowest average citations of 784 (See table 1.10).

2) Impact Factor (IF) Disparities Across Subject Categories

The Impact Factor measures a journal's average citation frequency per article published during the two preceding evaluation years, serving as a key indicator of academic influence. In 2022, the average IF for China's core scientific journals in natural sciences was 1.048. Among disciplinary categories, Management journals recorded the highest mean IF (2.106), while Multidisciplinary Sciences showed the lowest (0.678). (See table 1.11).

3) Disciplinary Variations in Scholarly Impact Diffusion

The Open Factor (an ISTIC index from *Chinese S&T Journal Citation Reports*) refers to the minimum number of citing journals that account for half of a journal's total citations, reflecting the concentration of its academic influence. In 2022, the average Open

Tab. 1.10 – Average total cited frequency of China's core STM journals in various disciplines in 2022.

No.	Discipline	Average total cited frequency		
		Chinese-language journals	English-language journals	Average total cited frequency
1	Management	3002	—	3002
2	Agronomy	1929	804	1870
3	Science	1946	1021	1799
4	Engineering Technology	1759	1115	1718
5	Medicine	1623	768	1589
6	Multidisciplinary Sciences	740	1353	784

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

Tab. 1.11 – Average impact factor of China's core scientific journals by subject (2022).

No.	Discipline	Average IF		
		Chinese-language journals	English-language journals	Average IF
1	Management	2.106	—	2.106
2	Agronomy	1.180	1.063	1.174
3	Science	1.157	0.916	1.119
4	Engineering Technology	1.060	1.007	1.056
5	Medicine	0.967	0.963	0.967
6	Multidisciplinary Sciences	0.651	1.028	0.678

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

Factor for China's core scientific journals in natural sciences was 23.56. Among disciplinary categories, Multidisciplinary Sciences exhibited the highest average value (51.99), while Engineering Technology had the lowest (17.14). (See table 1.12).

4) Cited Half-Life

Cited half-life refers to the median age of the articles that were cited in a given year, indicating the time span during which half of all the citations to the journal were published. In 2022, the average cited half-life for China's core STM journals in the area of natural sciences was 5.0. Among all disciplines, Science had the highest average cited half-life at 6.7, while Medicine had the lowest at 4.0, as shown in table 1.13.

Tab. 1.12 – Average openness factor for China's core scientific journals in various disciplines in 2022.

No.	Discipline	Average openness factor		
		Chinese-language journals	English-language journals	Average openness factor
1	Multidisciplinary Sciences	53.23	35.86	51.99
2	Medicine	29.45	32.00	29.56
3	Management	22.89	—	22.89
4	Agronomy	20.39	14.50	20.08
5	Science	20.63	16.28	19.94
6	Engineering Technology	17.53	11.37	17.14

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

Tab. 1.13 – Average cited half-life of China's core STM journals in various disciplines in 2022.

No.	Discipline	Average cited half-life		
		Chinese-language journals	English-language journals	Average cited half-life
1	Science	6.8	6.2	6.7
2	Agronomy	5.7	4.3	5.7
3	Multidisciplinary Sciences	5.5	5.3	5.5
4	Engineering Technology	5.0	4.1	4.9
5	Management	4.6	—	4.6
6	Medicine	4.0	4.8	4.0

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

5) Non-Self-Cited Rate Across Various Disciplines

Non-self-cited rate refers to the proportion of citations received from other journals in the total cited frequency of one journal, measuring the capability of journals' academic dissemination. In 2022, the average non-self-cited rate for China's core STM journals in natural sciences was 0.83. Among different disciplines, Multidisciplinary Sciences had the highest average rate at 0.89, while Engineering Technology had the lowest rate at 0.80, see table 1.14.

1.2.1.3 Source Analysis of the Journal Articles

1) Source Articles Count

The source articles count refers to the number of publications meeting the selection criteria for source papers in the statistical analysis. Among all content published in

Tab. 1.14 – Average non-self-cited rates of China's core STM journals by discipline (2022).

No.	Discipline	Average non-self-cited rate		
		Chinese-language journals	English-language journals	Average non-self-cited rate
1	Multidisciplinary Sciences	0.89	0.84	0.89
2	Management	0.87	—	0.87
3	Medicine	0.86	0.88	0.86
4	Agronomy	0.85	0.85	0.85
5	Science	0.83	0.79	0.83
6	Engineering Technology	0.80	0.70	0.80

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

Tab. 1.15 – Average source articles count of China's core STM journals in different disciplines in 2022.

No.	Discipline	Average source articles count		
		Chinese-language journals	English-language journals	Average count
1	Medicine	248	132	243
2	Engineering Technology	222	199	220
3	Agronomy	199	149	197
4	Management	192	—	192
5	Science	151	172	154
6	Multidisciplinary Sciences	121	166	124

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

journals, only academic and technical literature reporting scientific discoveries and technological innovations is used as a data source for China's STM paper statistics. In 2022, the average number of source articles for China's core STM journals in natural sciences was 212. Among different disciplines, Medicine had the highest average count at 243, while Multidisciplinary Sciences had the lowest at 124, see table 1.15.

2) Average Citations Count

The average citations count refers to the number of references cited per article in the source journals. The total number of references cited by the paper is an indicator measuring the level of scientific communication and the capability of absorbing external information by the journals. In 2022, the average number of citations in China's core STM journals in natural sciences was 28.3. Among all the disciplines, Science had the highest average number of citations at 39.7, and Medicine had the lowest at 25.0, see table 1.16.

Tab. 1.16 – Average citations count of China's core STM journals in different disciplines in 2022.

No.	Disciplines	Average no. of citations		
		Chinese-language journals	English-language journals	Average citation count
1	Science	37.4	52.0	39.7
2	Management	37.2	—	37.2
3	Agronomy	30.8	65.4	32.6
4	Multidisciplinary Sciences	26.2	44.2	27.5
5	Engineering Technology	23.7	47.8	25.3
6	Medicine	24.0	47.8	25.0

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

3) Geographical Coverage

The geographical coverage refers to the number of regions (provinces, autonomous regions, and municipalities) that contribute papers to a source journal. It is counted across China's 31 provincial-level regions (excluding Hong Kong SAR, Macao SAR, and Taiwan regions). This is an indicator measuring the coverage of the papers on the journal and the extent of its national influence. In 2022, the average geographical distribution index for China's core STM journals in the natural sciences was 22. Among the disciplines, Medicine had the highest average index of 24, while Multidisciplinary Sciences had the lowest of 17, as shown in table 1.17.

Tab. 1.17 – Average geographical coverage of China's core STM journals in different disciplines in 2022.

No.	Disciplines	Average geographical coverage		
		Chinese-language journals	English-language journals	Average geographical distribution index
1	Medicine	24	16	24
2	Management	23	—	23
3	Science	22	20	22
4	Agronomy	22	18	22
5	Engineering Technology	22	20	22
6	Multidisciplinary Sciences	17	19	17

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

4) The Proportion of Articles from International Sources Needs to Be Increased

The overseas paper ratio is the proportion of articles written by international authors in a source journal relative to its total papers. This index measures the level of international exchange of the journal. In 2022, the average overseas paper ratio for China's Core STM journals in natural sciences was 0.03. Among all the disciplinary fields, the average overseas paper ratios for Chinese-language journals were relatively high in Science and Management. For English-language journals, journals in Agronomy had the highest overseas paper ratio at 0.43, see table 1.18.

Tab. 1.18 – Average overseas paper ratio of China's core STM journals by disciplines in 2022.

No.	Disciplines	Average overseas paper ratio		
		Chinese-language journals	English-language journals	Average overseas paper ratio
1	Science	0.02	0.24	0.05
2	Agronomy	0.01	0.43	0.03
3	Engineering Technology	0.01	0.26	0.03
4	Multidisciplinary Sciences	0.01	0.21	0.02
5	Medicine	0.01	0.30	0.02
6	Management	0.02	—	0.02

Note: Data was from the *Chinese S&T Journal Citation Reports (Natural Science) 2023*.
Sorted in descending order by average indicator value.

5) Funded Paper Ratio

Funded paper ratio refers to the proportion of papers in a source journal that are supported by national, ministerial, and provincial-level, or by other major research funds, relative to its total number of papers. This is an important indicator for assessing the academic quality of a journal. In 2022, the average funded paper ratio for China's core scientific journals in natural sciences was 0.66. Among disciplines, Management had the highest ratio (0.90), while Medicine had the lowest (0.54), as shown in table 1.19.

6) Citation Half-Life

Citation half-life is the median age of the references cited by a journal, indicating the period within which the newer 50% of its cited references were published. This metric reflects the novelty of the literature utilized by the authors. In 2022, the average citation half-life for China's core STM journals in natural sciences was 6.3. Among various disciplines, Science showed the highest average citation half-life (8.5). Medicine recorded the lowest (5.0), as detailed in table 1.20.

Tab. 1.19 – Average funded paper ratio of China's core STM journals by discipline in 2022.

No.	Disciplines	Average funded paper ratio		
		Chinese-language journals	English-language journals	Average funded paper ratio
1	Management	0.90	—	0.90
2	Multidisciplinary Sciences	0.86	0.79	0.86
3	Science	0.82	0.77	0.81
4	Agronomy	0.80	0.63	0.79
5	Engineering Technology	0.66	0.72	0.67
6	Medicine	0.54	0.52	0.54

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023.*
Sorted in descending order by average indicator value.

Tab. 1.20 – Average cited half-life of China's core STM journals by discipline in 2022.

No.	Disciplines	Average cited half-life		
		Chinese-language journals	English-language journals	Average cited half-life
1	Science	8.3	9.2	8.5
2	Agronomy	7.2	8.7	7.3
3	Management	7.0	—	7.0
4	Multidisciplinary Sciences	6.7	6.5	6.7
5	Engineering Technology	6.2	6.5	6.2
6	Medicine	5.0	6.0	5.0

Note: Data is from *Chinese S&T Journal Citation Reports (Natural Science) 2023.*
Sorted in descending order by average indicator value.

1.2.2 Impact Analysis of China's English-Language Scientific Journals

1.2.2.1 China's English-Language STM Journals Primarily Concentrated in Engineering Technology and Science

According to the *Chinese English S&T Journal Citation Reports 2023*, there were 454 English-language STM journals (with CN serial number; excluding journals from China's Hong Kong SAR, Macao SAR, and Taiwan regions). These journals were predominantly distributed across three major subject fields: Engineering Technology (40.53%), Science (29.07%), and Medicine (21.37%), see table 1.21.

Tab. 1.21 – Distribution of China's English-language STM journals by subject area in 2023.

No.	Subject area	No. of journals	Percentage/%
1	Engineering Technology	184	40.53
2	Science	132	29.07
3	Medicine	97	21.37
4	Agronomy	20	4.41
5	Management and other	12	2.64
6	Multidisciplinary Sciences	9	1.98

Note: Data is from the *Chinese English S&T Journal Citation Reports 2023*.
Sorted in descending order by the number of journals.

Tab. 1.22 – Disciplines with over 10 English-language journals in China (2023).

No.	Discipline	Subject area	No. of journals
1	Mathematics	Science	23
2	Comprehensive Materials Science	Engineering Technology	18
3	Physics	Science	16
4	Life Science Basics	Science	15
5	Electronic Technology	Engineering Technology	12
6	Chemistry	Science	12
7	Biomedical Engineering	Engineering Technology	11
8	Environment and Resource S&T	Engineering Technology	10
9	Entomology, Zoology	Science	10
10	Comprehensive Energy Science	Engineering Technology	10
11	Neurology, Psychiatry	Medicine	10
12	Information and Systems Science Engineering, and Technology	Engineering Technology	10

Note: Data is from the *Chinese English S&T Journal Citation Reports 2023*.
Sorted in descending order by the number of journals.

Disciplinary analysis (table 1.22) reveals that 12 disciplines hosted 10 or more English-language STM journals, collectively accounting for 157 journals, which was 34.58% of the total. Mathematics ranked first with 23 journals, followed by Comprehensive Materials Science (18 journals).

1.2.2.2 Domestic Impact Analysis

1) Increase in Article Output of China's English-Language Scientific Journals

In 2022, the average source article count for China's English-language scientific journals was 101.23, representing a 3.27% increase from 2021. The average funded article ratio was 0.80, marking a 19.40% increase compared to 2021. The average overseas article ratio was 0.22, a decrease of 24.14% from 2021. The average cited half-life was 7.92, reflecting a decrease of 13.64% from 2021 (table 1.23).

Tab. 1.23 – Comparison of source metrics for China's English-language scientific journals: 2021–2022.

Source metrics	2021	2022	Growth rate/%
Avg. Source Article Count	98.02	101.23	3.27
Avg. Funded Article Ratio	0.67	0.80	19.40
Avg. Overseas Article Ratio	0.29	0.22	–24.14
Avg. Cited Half-life	7.92	6.84	–13.64

Note: Data is from the *Chinese English S&T Journal Citation Reports 2023*. Calculations are based on the Wanfang Data – Digital Periodicals platform. Data for 2021 was collected from 6311 journals in China, and data for 2022 were collected from 7101 journals in China.

2) Improvement in Key Academic Impact Metrics of China's English-Language Scientific Journals

Total citation times refers to the total number of times that all papers published in a journal since its inception have been cited in the statistical year. Impact Factor refers to the average number of citations received per paper published in the journal over the preceding two years. Immediacy Index measures the number of times papers published in a journal in a given year are cited within that same year. Non-self-cited ratio refers to the proportion of the journal's total citation frequency accounted for by citations from other journals. In 2022, the average total cited times of China's English-language STM journals was 617.34, representing a 10.37% increase from 2021 (table 1.24). The average Impact Factor was 0.717, a 15.83% increase compared to 2021. The average Immediacy Index was 0.162, marking a 35.00% increase from 2021. The average Non-self-cited ratio was 0.80%, reflecting a decrease of 3.61% from 2021. The average Cited Half-life was 5.56, a decrease of 18.83% compared to 2021.

Tab. 1.24 – Comparison of impact metrics of China's English-language STM journals: 2021-2022.

Impact metrics	2021	2022	Growth rate/%
Avg. Total Cited Times	559.34	617.34	10.37
Avg. Impact Factor	0.619	0.717	15.83
Avg. Immediacy Index	0.120	0.162	35
Avg. Non-self-cited Ratio/%	0.83	0.80	–3.61
Avg. Cited Half-life	6.85	5.56	–18.83

Note: Data is from the *Chinese English S&T Journal Citation Reports 2023*. Calculations are based on the Wanfang Data – Digital Periodicals platform. Data for 2021 were collected from 6311 journals in China, and data for 2022 were collected from 7101 journals in China.

1.2.2.3 International Impact Analysis

1) Indexation in International Databases

With the rapid development of science and technology in China, the role of China's scientific journals in international academic exchange has become increasingly prominent. A growing number of these journals are being indexed by internationally renowned databases. The *Chinese English S&T Journal Citation Reports 2023* documented the

indexation of China's English-language scientific journals by nine major databases: Web of Science (WoS), Scopus, Inspec (Physics and Engineering), Medline (Biological and Medical Sciences), EI (Engineering), CAplus Core Journal (Chemistry), Mathematical Reviews (Mathematics), Japan Science & Technology Agency-Bibliographic Database China (JSTChina), and the Chinese Science and Technology Papers and Citation Database (CSTPCD). The indexation situation is presented in table 1.25.

Tab. 1.25 – Indexation of China's English-language journals in international databases.

No.	Database name	Number of journals
1	Scopus	310
2	JSTChina	197
3	WoS	193
4	Inspec	138
5	CSTPCD	137
6	Medline	111
7	EI	86
8	CAplus Core Journal	34
9	Mathematical Reviews	16

Note: Data is from *Chinese English S&T Journal Citation Reports 2023*.
Sorted in descending order by the number of journals.

2) International Cumulative Cited Counts

As of the end of July 2023, 454 Chinese English-language scientific journals had a total of 657 600 articles cited in the SCI database (Web of Science). The cumulative total cited count for these journals within the SCI database reached 7 383 300 times. The top 10 Chinese English-language scientific journals ranked by cumulative cited count are presented in table 1.26. The top 10 journals ranked by the number of cited articles are shown in table 1.27.

Tab. 1.26 – The Top 10 Chinese English-language scientific journals ranked by cumulative cited count.

No.	Journal title	Cited articles	Cumulative cited times	Highest cited times per article
1	*Cell Research*	4839	233 834	4036
2	*Plasma Science and Technology*	4424	223 582	211
3	*Nano Research*	5460	194 698	2869
4	*Chinese Medical Journal*	15 006	159 046	897
5	*Acta Pharmacologica Sinica*	10 129	149 859	1064
6	*Chinese Chemical Letters*	15 585	141 566	267
7	*Transactions of Nonferrous Metals Society of China*	10 414	140 857	501

Tab. 1.26 – (continued).

No.	Journal title	Cited articles	Cumulative cited times	Highest cited times per article
8	*Molecular Plant*	2383	138 692	4649
9	*Chinese Physics Letters*	23 315	129 494	1524
10	*Chinese Physics B*	23 832	126 719	526

Note: Data is from the *Chinese English S&T Journal Citation Reports 2023*. Statistics are based on data from Clarivate's Web of Science (SCI) database covering the period from 1995 to July 2023 (retrieval date: end of July 2023).
Ranked in descending order by cumulative cited count.

Tab. 1.27 – Top 10 Chinese English-language scientific journals ranked by the number of cited articles.

No.	Journal title	No. of cited articles	No. of cumulative cited count	Highest cited times per article
1	*Chinese Physics B*	23 832	126 719	526
2	*Chinese Physics Letters*	23 315	129 494	1524
3	*Chinese Chemical Letters*	15 585	141 566	267
4	*Chinese Medical Journal*	15 006	159 046	897
5	*Acta Geologica Sinica* (*English Edition*)	11 987	118 357	487
6	*Acta Metallurgica Sinica* (*English Letters*)	11 600	75 276	385
7	*Transactions of Nonferrous Metals Society of China*	10 414	140 857	501
8	*Communications in Theoretical Physics*	10 404	55 732	622
9	*Acta Pharmacologica Sinica*	10 129	149 859	1064
10	*Journal of Environmental Sciences*	9537	117 163	274

Note: Data is from the *Chinese English S&T Journal Citation Reports 2023*. Statistics are based on data from Clarivate's Web of Science (SCI) database covering the period from 1995 to July 2023 (retrieval date: end of July 2023).
Ranked in descending order by the number of cited articles.

Chapter 2

Analysis of Papers Published in China's Scientific Journals

Yanqin WENG, Yue XIAO, Ruijuan YAN, Aitong WU, Junhong WU and Xiukun SUN

Abstract

Analysis of Papers Published in Chinese-language Scientific Journals

The number of publications in Chinese-language scientific journals has shown a year-on-year decreasing trend. According to CNKI data, Chinese-language scientific journals published 997 300 citable articles in 2023, representing a decrease of 1.19% compared to 2022. Automation and Computer Technology, Transportation Engineering, and Building and Civil Engineering ranked as the top three disciplines in terms of the number of published papers for three consecutive years.

New publishing models accelerated the dissemination of Chinese-language STM journals. From 2021 to 2023, a total of 415 500 articles that were online first publications have been formally published in 1476 kinds of Chinese-language journals. From 2021 to 2023, a total of 4320 papers from 93 Chinese-language STM journals were published as enhanced publications on CNKI. Launched in 2022 by CAST, the Bilingual Communication Project for Scientific Journals has resulted in the display of 5609 bilingual long abstracts from 317 selected journals and 4317 structured full-text papers from 429 selected journals on the CNKI bilingual communication platform as of September 2024.

The domestic influence of Chinese-language STM journals has been rising steadily. Based on statistics from the 2022–2024 editions (statistical years: 2021–2023) of CNKI's *Annual Report for Chinese Academic Journal Impact Factors* (Impact Factors Annual Report for short), 3589 Chinese-language STM journals were covered in the 2023 report. These journals recorded a composite total cited frequency of 9 779 300, marking a 4.28% increase compared to 2021 and demonstrating an upward trend. The average composite total cited times per journal reached 2726.31, a 3.03% growth from 2021. Furthermore, the average composite impact factor per journal in 2023 was 1.234, reflecting a 9.69% increase over 2021 and sustaining a rising trajectory.

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The international influence of Chinese-language STM journals continued to grow. According to the 2021–2023 editions of the *Annual Report for International Citation of Chinese Academic Journals* (statistical years: 2020–2022), Chinese-language STM journals achieved an international total cited times from non-self-sources of 890 400 in 2022, representing a substantial 46.93% increase compared to 2020. The average international total cited times per journal reached 261.05, marking a 29.53% increase from 2020. This growth rate was significantly higher than that of Chinese-language journals' domestic performance, demonstrating the rapid expansion of the international influence of Chinese-language STM journals over the past three years, with an accelerated growth trajectory. The average international non-self-citation impact factor for Chinese-language STM journals in 2022 was 0.126, reflecting a sharp increase of 81.86% over 2020 and indicating a pronounced upward trend.

According to data from the *Academic Essentials Database,* the Chinese-language scientific journals published 158 160 highly cited papers between 2021 and 2024. The top 20 institutions were predominantly universities and research organizations. Among these, CAS produced the highest number of highly cited papers (6502), while Tsinghua University achieved the highest citation count per paper (88.63). Regarding the top three Chinese-language scientific journals in each discipline by the number of highly cited papers published from 2014 to 2024, *Acta Ecologica Sinica* published the largest volume of highly cited papers (1756), and *Acta Geographica Sinica* recorded the highest citation count per highly cited paper (146.72).

Analysis of Paper Publication in China's SCI Journals

In 2023, SCI papers authored by Chinese researchers (728 707) accounted for 33.42% of global SCI publications (2 180 463), representing a decrease of 12 609 papers from 2022. During the same period, 240 China-published SCI journals contributed 37 824 papers, comprising 1.73% of global SCI output and marking an increase of 263 papers from 2022 (published by 235 journals). Chinese-authored papers constituted the primary source for China-published SCI journals (33 439 papers, 88.41% of their total output). Despite steady growth over the past three years in the number of China-published SCI journals, their contribution in terms of number of articles and global share remains very low relative to the overall contribution from authors from China.

During the decade between 2014 and 2023, Chinese-authored SCI papers demonstrated sustained growth, with 2023 witnessing the first slight decline. In the meantime, papers in China-published SCI journals have maintained consistent growth since 2017. Chinese-authored papers consistently outnumbered those in domestic SCI journals, with the gap widening from 9.45 times (2014) to 19.27 times in 2023. The proportion of overseas authors in China-published SCI journals peaked at 19.76% in 2020, followed by consecutive yearly declines to 17.49% in 2023.

Analyzing from the perspective of disciplines of the papers, Physics recorded the highest global share (5.24%) of SCI papers published in China's SCI journals relative to the global output in the discipline. Chemistry, Physics, and Geosciences were disciplines where both the proportion of articles in China-published SCI journals and the proportion of papers authored by Chinese researchers constituted comparatively high shares of global SCI publications.

In 2023, SCI papers authored by Chinese researchers were cited 2 070 225 times, accounting for 42.91% of global SCI citations (4 824 572). Papers published in China's SCI

journals were cited 152 121 times, representing 3.15% of global citations to SCI journals, notably higher than the number of papers contributed from China's SCI journals to the global SCI papers (1.73%).

The citation impact of China's SCI journal papers was 4.02 in 2023, while that of Chinese-authored SCI papers was 2.84, both of which exceeded the global SCI citation impact of 2.21. Since 2021, the citation impact of papers in China's SCI journals has consistently exceeded that of SCI papers authored by Chinese researchers.

In 2023, China's SCI journals published 24 849 papers in the top quartile, accounting for 2.19% of the global Q1 papers in total (1 136 887). Chinese-authored Q1 papers accounted for 421 199, representing 37.05% of the global Q1 output. Over the decade from 2014 to 2023, China's SCI journals demonstrated a pronounced upward trend in Q1 articles. The proportion of Q1 papers rose from 6.28% in 2014 to 65.70% in 2023, indicating that over 60% of papers in these journals rank in the first quartile, clear evidence of significant quality improvement in China's SCI journals.

In 2023, 160 SCI journals in China (66.67% of the national total) were classified as Q1 journals, comprising 3.45% of the global Q1 journal count (4088 titles).

Among 240 SCI journals in China, 141 (58.75%) published highly cited papers; 54 journals (22.50%) published trending papers; 237 journals featured internationally collaborative papers (6616 articles); and 143 journals achieved a Category Normalized Citation Impact (CNCI) greater than 1.0 for their internationally co-authored papers, signifying citation performance exceeding the global average within their respective disciplines.

2.1 Analysis of Papers Published in Chinese-Language STM Journals Based on China's Databases

2.1.1 Current Status of Papers Published in Chinese-Language Scientific Journals

This section analyzes 4319 Chinese-language scientific journals in CNKI[1] from 2021 to 2023 (hereafter referred to as Chinese-language STM journals in this section). The analysis focuses on the annual volume of published papers, disciplinary distribution, article collaboration patterns, and institutional affiliations[2].

2.1.1.1 Declining Trend in Article Output of Chinese STM Journals

From 2021 to 2023, Chinese-language STM journals published a total of 3 119 600 citable articles. In 2023, 997 300 citable articles were published, a decrease of 1.19% compared to

[1]China National Knowledge Infrastructure, developed by China Academic Journals (CD Edition) Electronic Publishing House Co., Ltd. website: www.cnki.net.

[2]This section is based on statistics from journals that were included in the 2023 annual inspection of national periodicals by the National Press and Publication Administration 2023 and were fully indexed by CNKI.

2022. The preceding year (2022) saw a more obvious decline of 9.32% relative to 2021, indicating a moderating trend in the rate of decrease by 2023 (figure 2.1). Multiple factors contributed to these shifts. The three-year COVID-19 pandemic significantly impacted research activities, leading to a modest overall reduction in scientific output. Recent policy reforms de-emphasizing quantitative metrics (*e.g.*, Breaking the Five-Only/Four-Only evaluation systems, which unduly emphasize the papers, titles, degrees, awards, and talent titles) have slowed the outflow of high-quality papers to international journals. The Excellence Action Plan for China's STM journals, launched in 2019, World-Class STM Journals Initiative in particular, has yielded substantial progress. Collectively, these developments mitigated the downward trajectory of paper publications in Chinese-language journals from 2022 to 2023.

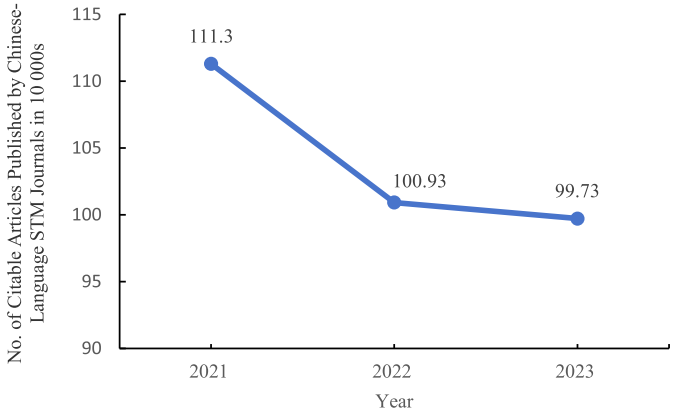


FIG. 2.1 – No. of citable articles published by Chinese-language STM journals between 2021 and 2023.

2.1.1.2 Disciplinary Distribution of Papers in China's STM Journals

This analysis of the disciplinary distribution of papers in China's STM journals adopts the 60 specialized disciplines in the *Annual Report for Chinese Academic Journal Impact Factors (Natural Sciences)* (hereafter referred to as the *Impact Factors Annual Report*). Among the papers published from 2021 to 2023, approximately 149 200 papers, 161 000 papers, and 134 300 papers, respectively, fell within the social sciences or interdisciplinary social sciences. Papers in science and technology fields numbered about 974 900, 893 600, and 885 800 for the same years, respectively. Some papers may span two or more specialized fields.

Automation Technology and Computer Technology, Transportation Engineering, and Building and Civil Engineering ranked among the top three disciplines in terms of paper output for three consecutive years (table 2.1). Analysis of the disciplinary distribution of article volume reveals that high-output disciplines typically share characteristics such as a large workforce, close ties to national economic development, and a concentration of emerging interdisciplinary subfields. For instance, the information technology-related cluster, including Automation Technology and Computer Technology, Electrical Engineering, Radio Electronics, and Telecommunications Technology, all ranked high in paper

TAB. 2.1 – Number and percentage of articles published in Chinese-language STM journals by disciplinary distribution between 2021 and 2023.

No.	Discipline	2021			2022			2023		
		No. of articles	Percentage/ %	Ranking	No. of articles	Percentage/ %	Ranking	No. of articles	Percentage/ %	Ranking
1	Automation Technology & Computer Technology	79 919	7.24	1	77 203	7.55	1	80 876	7.95	1
2	Transportation Engineering	71 210	6.45	2	64 302	6.29	2	66 053	6.49	2
3	Building and Civil Engineering	65 504	5.93	3	63 059	6.17	3	62 879	6.18	3
4	Traditional Chinese Medicine and Pharmacology	57 568	5.21	5	56 189	5.50	4	56 978	5.60	4
5	Internal Medicine	59 178	5.36	4	50 491	4.94	5	48 019	4.72	5
6	Environmental Science and Technology	44 464	4.03	7	43 506	4.26	6	44 598	4.38	6
7	Electrical Engineering	43 315	3.92	9	41 462	4.06	7	43 018	4.23	7
8	Oncology	44 219	4.00	8	40 332	3.95	8	38 176	3.75	8
9	Nursing	47 045	4.26	6	37 893	3.71	9	37 148	3.65	9
10	Chemical Engineering	35 046	3.17	11	33 674	3.29	11	32 706	3.21	10
11	Surgery	40 561	3.67	10	35 342	3.46	10	32 625	3.21	11
12	Radio Electronics and Telecommunications Technology	31 311	2.84	12	28 503	2.79	12	27 722	2.72	12
13	Animal Husbandry and Veterinary Science	27 798	2.52	14	23 969	2.35	14	24 904	2.45	13
14	Obstetrics & Gynecology and Pediatrics	30 397	2.75	13	25 130	2.46	13	23 272	2.29	14
15	Food Science and Technology	21 972	1.99	15	20 992	2.05	16	21 207	2.08	15
16	Metallurgy and Metal Technology	21 821	1.98	16	21 020	2.06	15	21 071	2.07	16
17	Mining Engineering Technology	21 294	1.93	18	19 419	1.90	17	20 117	1.98	17
18	Agronomy	20 167	1.83	20	18 189	1.78	20	19 015	1.87	18
19	Neurology and Psychiatry	21 626	1.96	17	19 343	1.89	18	18 708	1.84	19
20	Comprehensive Clinical Medicine	20 738	1.88	19	19 014	1.86	19	17 354	1.71	20
21	Chemistry	16 880	1.53	22	16 653	1.63	21	16 216	1.59	21
22	Geology	16 411	1.49	23	15 736	1.54	23	15 737	1.55	22

Tab. 2.1 – (continued).

No.	Discipline	2021			2022			2023		
		No. of articles	Percentage/ %	Ranking	No. of articles	Percentage/ %	Ranking	No. of articles	Percentage/ %	Ranking
23	Hydraulic Engineering	15 891	1.44	25	14 848	1.45	24	15 582	1.53	23
24	Oil and Gas Industry	17 252	1.56	21	16 169	1.58	22	15 344	1.51	24
25	Horticulture	15 976	1.45	24	14 288	1.40	25	14 098	1.39	25
26	Mechanical Engineering	14 429	1.31	27	13 224	1.29	26	13 554	1.33	26
27	Aeronautics & Aerospace Science and Technology	12 944	1.17	28	12 948	1.27	27	13 167	1.29	27
28	Medical and Health Services Management	14 544	1.32	26	12 758	1.25	28	11 570	1.14	28
29	Materials Science	9723	0.88	33	9722	0.95	30	9899	0.97	29
30	Forestry	11 120	1.01	29	9184	0.90	33	9732	0.96	30
31	Light Industry (excl. Textiles and Food)	9700	0.88	34	8849	0.87	35	9551	0.94	31
32	Biology	9137	0.83	36	9135	0.89	34	9284	0.91	32
33	Plant Protection	10 664	0.97	30	9419	0.92	32	9188	0.90	33
34	Preventive Medicine and Hygiene	10 289	0.93	32	9808	0.96	29	9075	0.89	34
35	Pharmacology	10 415	0.94	31	9608	0.94	31	9050	0.89	35
36	Otorhinolaryngology and Ophthalmology	9231	0.84	35	8231	0.81	36	7839	0.77	36
37	Basic Agricultural Science	8108	0.73	37	7635	0.75	37	7747	0.76	37
38	Fundamental Disciplines of Engineering and Technology Science	6249	0.57	40	6166	0.60	40	6444	0.63	38
39	Basic Medicine	6164	0.56	41	6431	0.63	39	6178	0.61	39
40	Mathematics	7260	0.66	38	6684	0.65	38	6159	0.61	40
41	Surveying & Mapping Science and Technology	5761	0.52	42	6012	0.59	41	6085	0.60	41
42	Agricultural Engineering	6745	0.61	39	5834	0.57	42	6035	0.59	42
43	Atmospheric Sciences	5452	0.49	44	5181	0.51	44	5244	0.52	43
44	Energy & Power Engineering	5501	0.50	43	5265	0.52	43	5219	0.51	44
45	Aquaculture	4666	0.42	46	4598	0.45	46	4853	0.48	45
46	Oral Medicine	5398	0.49	45	4855	0.48	45	4506	0.44	46

Tab. 2.1 – (continued).

No.	Discipline	2021			2022			2023		
		No. of articles	Percentage/ %	Ranking	No. of articles	Percentage/ %	Ranking	No. of articles	Percentage/ %	Ranking
47	Metallurgical Engineering Technology	4391	0.40	47	4433	0.43	47	4470	0.44	47
48	Physics	3837	0.35	49	4326	0.42	48	4103	0.40	48
49	Geophysics	4177	0.38	48	4039	0.40	49	4088	0.40	49
50	Textiles Science and Technology	3565	0.32	50	3408	0.33	50	3486	0.34	50
51	Oceanography	3175	0.29	52	3321	0.32	51	3148	0.31	51
52	Dermatology and Venereology	3301	0.30	51	2895	0.28	53	2998	0.29	52
53	Military Medicine and Specialized Medicine	2995	0.27	53	3038	0.30	52	2718	0.27	53
54	Weapon Industry and Military Technology	2443	0.22	54	2223	0.22	54	2108	0.21	54
55	Nuclear Science and Technology	1643	0.15	55	1836	0.18	55	1975	0.19	55
56	Mechanics	1395	0.13	56	1648	0.16	56	1817	0.18	56
57	Safety Science and Technology	1027	0.09	57	1205	0.12	57	1390	0.14	57
58	Physical Geography	666	0.06	58	610	0.06	58	669	0.07	58
59	Astronomy	536	0.05	59	561	0.05	59	659	0.06	59
60	Systems Science	142	0.01	60	170	0.02	60	194	0.02	60
	Total	1 104 356	100.00	—	1 021 986	100	—	1 017 625	100.00	—

Note: Sorted in descending order by the number of papers published in 2023. Disciplinary overlap exists, meaning a single paper may involve two or more professional fields. "Ranking" refers to the subject's position in the annual publication volume ranking.
Data is sourced from CNKI.

publication volume. Within the transportation and civil engineering cluster, the smart upgrading of vehicles and construction technologies has spawned numerous emerging cutting-edge technologies. The environment and life health cluster, encompassing Environmental Science and Technology, Chinese Traditional Medicine and Pharmacology, Nursing, Internal Medicine, and Oncology, also yielded abundant research outputs.

For disciplines with low publication volume, some are highly specialized and naturally produce fewer papers, such as Systems Science and Physical Geography. Others had most of their research outputs published in foreign journals, examples include Astronomy, Mechanics, Oceanography, and Physics. When combined with the data on papers published in China's SCI journals presented in this chapter, it becomes evident that many scientific research papers from China's fundamental science fields are published in English in international journals.

2.1.1.3 New Publishing Models Accelerate the Dissemination of Chinese-Language STM Journals

Journal-Internet Integration refers to journals fully utilizing online platforms and network technologies, integrating them into the entire process of editing, publishing, dissemination, and distribution. This transforms traditional publishing models characterized by issue-based, full-text, print-only, and single-language publishing. It enables digital and online publishing methods such as article-level immediate, Online First, OA, data and video, bilingual and enhanced publishing, thereby significantly improving the efficiency and effectiveness of digital publishing[1]. CNKI has launched a series of digital publishing and dissemination platforms and tools to support this journal-internet integration.

Single-Article Online First Publishing refers to the prioritized digital publishing of an individual journal article *via* the Internet (including mobile networks) on the CNKI platform. Based on the editorial status at the time of Online First publishing, it is typically categorized into three types: Accepted Manuscripts are manuscripts that have undergone peer review, received final approval from the editor-in-chief, and have been accepted for publishing by the journal. For this type, the content is finalized. Typeset Manuscripts, meaning the accepted manuscripts formatted according to the journal's specific layout (including online presentation format). Both the content and layout are finalized, but details such as year of publishing, volume, issue, and page numbers may not yet be assigned. Finalized Issue Manuscripts are assembled manuscripts for a complete issue ready for print or digital publication, where the year of publishing, volume, issue, and page numbers have been assigned. After a period of online display, Online First articles are subsequently transitioned to formally published status as the corresponding print journal issue is released. As of August 2024, approximately 415 500 articles originally published *via* Online First between 2021 and 2023 had been transitioned to formal publication in Chinese-language scientific journals, appearing in 1476 different journals.

Enhanced publication is a form of digital publication comprising a root document and supplementary content, organized and packaged into an interconnected composite digital work. The root document refers to either a digital version identical in content to its printed counterpart or a purely digital publication with no print equivalent. The supplementary content, also termed enhanced materials, published alongside the root document, includes text, data tables, images, audio, video, software programs, manuscripts, etc., and is

typically accessible only online. As of August 2024, 4320 enhanced publications from 93 Chinese-language STM journals were published in CNKI between 2021 and 2023.

The bilingual publication employs a side-by-side full-text format as its basic model. CNKI launched the Chinese Elite Academic Journals Bilingual Digital Publishing Project in 2015. This initiative has collaborated with over 400 academic journals to publish more than 50 000 bilingual papers. Beyond this, CNKI's bilingual publishing platform converts academic literature into academic news releases (dual-manuscript publishing), enabling China's latest research to reach three distinct readerships: international academia, domestic education sectors, and the public. It also extracts academic innovations and key knowledge points from papers to build a searchable database linked to digital publications, facilitating rapid comprehension and precise extraction of core insights.

Since 2022, CAST has implemented the Bilingual Communication Project for Scientific Journals for three consecutive years. This project selects Chinese-language scientific journals with strong academic standing, significant influence, and foundational internationalization capabilities. It supports their high-quality papers by generating and translating bilingual long abstracts to enhance global visibility of China's scientific achievements, to facilitate international academic exchange and collaboration, and to increase the international impact and dissemination capability of Chinese-language scientific journals. As of September 2024, the project's bilingual communication platform has showcased 5609 long abstracts in both languages from 317 selected journals and 4317 structured full-text papers from 429 selected journals.

2.1.2 Analysis of the Influence of Chinese-Language Scientific Journals

2.1.2.1 Sustained Growth in Domestic Influence

The frequency of citations to the articles in a journal reflects its overall academic impact. The *Impact Factors Annual Report* published the comprehensive citation situation, the composite total cited frequency of the source journals covered in the *Impact Factors Annual Report*, full-text doctoral/master's theses in CNKI, and conference papers in CNKI databases.

The composite total cited frequency measures the total citations received by all citable articles published by a journal since its inception during a given statistical year, indicating its broad influence across scientific research and talent development. Based on the 2022–2024 editions of the *Impact Factors Annual Report* (statistical years: 2021–2023), 3589 Chinese-language scientific journals were evaluated in 2023. Their composite total cited frequency reached 9 779 300, a 4.28% increase from 2022. The average composite total cited frequency per journal was 2726.31, a 3.03% increase from 2021 (figure 2.2). These data demonstrate that the overall influence of Chinese-language STM journals continues to grow, though the growth rate has slowed down, essentially remaining flat.

Based on the 2022–2024 editions of *the Impact Factors Annual Report* (statistical years: 2021–2023), the composite impact factor per journal for Chinese-language scientific journals in 2023 was 1.234, marking a 9.69% increase from 2021 and demonstrating an upward trend (figure 2.3). Mathematically, the impact factor represents the cited frequency per article, serving as an indicator of a journal's average quality. The consistent growth in

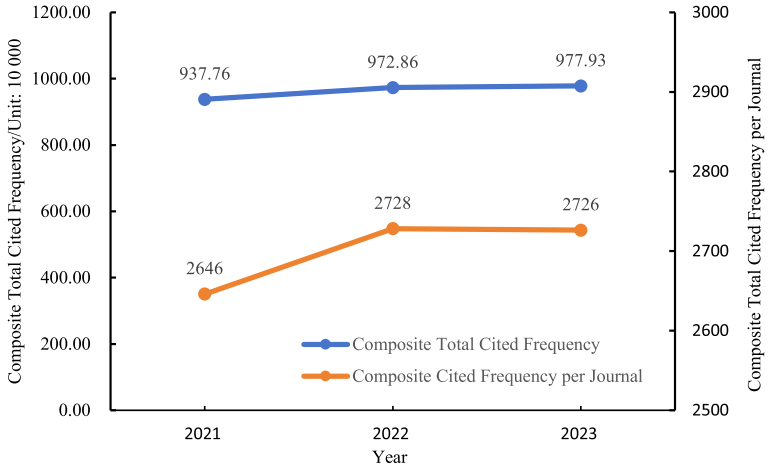


FIG. 2.2 – Composite total cited frequency of Chinese-language STM journals between 2021 and 2023.

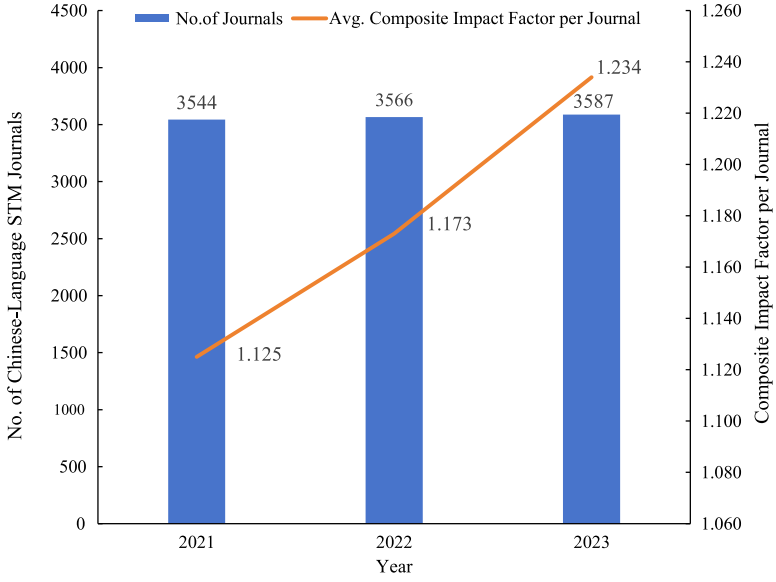


FIG. 2.3 – Composite impact factor per journal of Chinese-language STM journals from 2021 to 2023.

impact factors signifies continuous improvements in both the operational quality and academic influence of Chinese-language STM journals.

2.1.2.2 Sustained Increase of the International Influence

Based on data from the *Annual Report for International Citation of Chinese Academic Journals* 2021–2023 editions (statistical years: 2020–2022), Chinese-language scientific

journals were cited 890 400 times by international, non-self sources in 2022, a 46.93% increase from 2020. The average total times cited by international sources reached 261.05, marking a 29.53% increase from 2020. This growth rate was significantly higher than that of Chinese-language journals' domestic performance, demonstrating rapid expansion of the international influence of Chinese-language STM journals over the past three years, with an accelerated growth trajectory (figure 2.4).

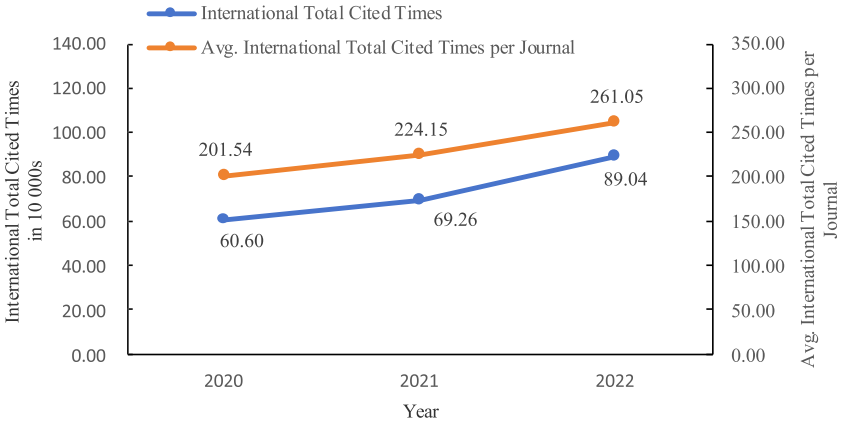


FIG. 2.4 – International total cited times of Chinese-language scientific journals from 2020 to 2022.

Based on data from the *Annual Report for International Citation of Chinese Academic Journals* 2021–2023 editions (statistical years: 2020–2022), the average international non-self-cited impact factor for Chinese-language STM journals in 2022 was 0.126, reflecting a sharp increase of 81.86% over 2020 and indicating a pronounced upward trend. This rapid growth in international non-self-cited impact factors was primarily attributable to the initially low baseline. Notably, the 2022 international metric remained 10 times lower than the domestic impact factor (1.233) (figure 2.5).

2.1.2.3 Analysis of Institutions and Journals Contributing Highly Cited Papers in Chinese-Language Scientific Journals

The Academic Essentials Database is an evaluation tool developed by CNKI's Assessment Center to support the selection of representative research papers and measure the influence of scholarly achievements. Based on statistical analysis of papers published over the past decade in CNKI-indexed sources, it identifies the top 1% of papers in terms of three metrics: PCSI index, non-self-cited frequency, and download count, collectively termed high-impact papers. Among these, highly cited papers are the top 1% of domestic journal and conference proceedings articles within the same publication year, discipline[3], and document type (research or review articles), ranked by total non-self-cited times. By

[3]The disciplinary system is based on the 168 disciplines from CNKI that are adopted by the CNKI Academic Essentials Database.

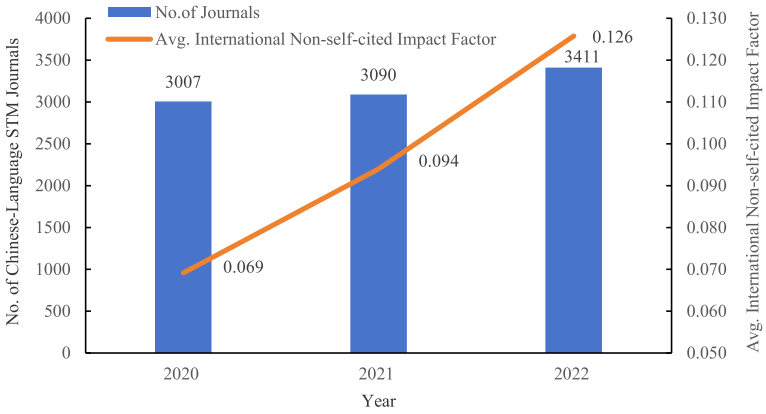


FIG. 2.5 – Average international non-self-cited impact factor of Chinese-language STM journals from 2020 to 2022.

analyzing the institutions producing these papers and the journals, this approach introduces new evaluation perspectives: assessing institutions by their high-impact papers and evaluating journals by their high-quality articles. This differs from impact factor-based evaluation, which measures a journal's average performance, whereas high-impact paper statistics quantify the volume of top-tier research a journal publishes.

1) Highly Cited Papers Predominantly Originate from Leading Universities and Research Institutions

According to the Academic Essentials Database (evaluation metrics statistics as of August 2024, with data updated in September 2024), Chinese-language scientific journals published 158 160 highly cited papers between 2014 and 2024. The top 20 institutions by volume of such papers consist primarily of universities and research institutes, with the Chinese Academy of Sciences (CAS) leading in output (6502 papers) and Tsinghua University achieving the highest number of citations per paper (88.63) (table 2.2).

TAB. 2.2 – Top 20 institutions by volume of highly cited papers between 2014 and 2024.

No.	Name of institution	No. of highly cited papers	Citations per paper
1	Chinese Academy of Sciences	6502	85.98
2	University of Chinese Academy of Sciences	2403	78.23
3	Tsinghua University	2249	88.63
4	TongJi University	1921	66.62
5	Chinese Academy of Agricultural Sciences	1815	71.93
6	Peking University	1478	79.68
7	Wuhan University	1342	73.74
8	Zhejiang University	1332	78.74
9	China Agricultural University	1326	69.45
10	Northwest A&F University	1270	66.86

Tab. 2.2 – (continued).

No.	Name of institution	No. of highly cited papers	Citations per paper
11	North China Electric Power University	1220	81.63
12	Southeast University	1184	70.95
13	China University of Mining and Technology	1183	72.19
14	Chongqing University	1181	67.02
15	Tianjin University	1098	75.20
16	Shanghai Jiao Tong University	1048	71.35
17	Xi'an Jiao Tong University	1039	56.54
18	Central South University	1038	58.58
19	South China University of Technology	1020	65.49
20	Huazhong University of Science and Technology	1018	68.83

2) Top 3 Chinese-Language Scientific Journals Publishing Highly Cited Papers by Discipline

Table 2.3 presents the top three Chinese-language scientific journals in each discipline ranked by the number of highly cited papers published between 2014 and 2024. Among these journals, *Acta Ecologica Sinica* published the highest volume of highly cited papers (1756 papers), while *Acta Geographica Sinica* achieved the highest average number of times cited per highly cited paper (146.72 citations).

Tab. 2.3 – Top 3 journals by highly cited paper count (2014–2024).

Discipline category	No.	Journal title	Highly cited paper count	Highest average times cited per highly cited paper
N General Natural Sciences	1	*China Population, Resources, and Environment*	614	121.57
	2	*Modern Educational Technology*	519	91.44
	3	*Journal of Natural Resources*	507	88.74
O Mathematics, Physics & Chemistry	1	*Chinese Journal of Rock Mechanics and Engineering*	895	72.91
	2	*Rock and Soil Mechanics*	871	61.21
	3	*Spectroscopy and Spectral Analysis*	293	42.80
P Astronomy & Earth Sciences	1	*Acta Geographica Sinica*	598	146.72
	2	*Geographical Research*	549	113.37
	3	*Scientia Geographica Sinica*	488	93.22

Tab. 2.3 – (continued).

Discipline category	No.	Journal title	Highly cited paper count	Highest average times cited per highly cited paper
Q Biological Sciences	1	*Acta Ecologica Sinica*	1756	78.09
	2	*Chinese Journal of Applied Ecology*	684	72.39
	3	*Chinese Journal of Ecology*	299	63.58
S Agriculture & Forestry, General Agricultural Sciences	1	*Transactions of the Chinese Society of Agricultural Engineering*	1466	72.68
	2	*Transactions of the Chinese Society for Agricultural Machinery*	854	65.07
	3	*Chinese Journal of Animal Nutrition*	657	43.18
T Industrial Technology	1	*Proceedings of the CSEE*	1473	128.50
	2	*Automation of Electric Power Systems*	1237	101.48
	3	*Food Science*	1183	49.47
U Transportation	1	*China Journal of Highway and Transport*	420	73.97
	2	*Journal of Transportation Systems Engineering and IT*	287	50.50
	3	*Automotive Engineering*	245	48.03
V Aviation and Aerospace	1	*Acta Aeronautica et Astronautica Sinica*	194	60.55
	2	*Aeronautical Manufacturing Technology*	126	60.41
	3	*Journal of System Simulation*	101	49.98
X Environmental Science and Safety Science	1	*Environmental Science*	524	82.61
	2	*China Environmental Science*	347	73.13
	3	*China Safety Science Journal*	266	49.42
R Medicine & Health	1	*Chinese Journal of Nursing*	1106	72.08
	2	*Chinese Journal of Gerontology*	1006	47.52
	3	*Chinese General Practice*	963	55.63

Note: Discipline classification follows journal CN numbers. Highly cited paper data is sourced from the Academic Essentials Database evaluation results.

2.2 Analysis of Papers Published in China's Scientific Journals Based on International Databases

Using the InCites database[4], this section objectively presents quantitative data on the disciplinary distribution, institutional distribution, international collaboration, and academic impact of papers published in SCI-indexed Chinese Scientific journals (hereinafter referred to as "Chinese SCI journals"). It documents and reveals the performance and international standing of these papers from a global perspective.

2.2.1 Disciplinary Analysis of Papers Published in Chinese SCI Journals

From a disciplinary perspective, statistical analysis was conducted on relevant data from 2023, including the number of papers, citation frequency, citation impact, and the proportion of internationally collaborated papers. The analysis covers global SCI publications, SCI papers by Chinese authors, papers published in Chinese SCI journals, and papers by Chinese authors published in Chinese SCI journals.

2.2.1.1 The Publication Volume of Chinese SCI Journals Remains Relatively Low, Contrasting Sharply with the Dominant Global Share of Papers by Chinese Authors

In terms of publication volume, Chinese authors published 728 707 SCI papers in 2023, representing 33.42% of the global total (2 180 463). Although this represents a decrease of 12 069 papers compared to the 740 776 published in 2022, China's share of global SCI papers remained largely stable amid an overall decline in global output (32.42% in 2022). During the same period, 240[5] Chinese SCI journals published 37 824 papers, constituting 1.73% of global SCI publications. This reflects an increase of 263 papers compared to the 37 561 papers (1.64% of global SCI output) published by 235 Chinese SCI journals in 2022. Papers by Chinese authors constitute the primary source of publications in Chinese SCI journals, totaling 33 439 papers and representing 88.41% of all papers in these journals—a slight increase from 87.64% in 2022. Over the past three years, despite steady growth in the number of Chinese SCI journals, their publication volume, and global share,

[4]The InCites database is a research performance and disciplinary analysis tool developed by Clarivate through the integration and analysis of authoritative citation data from the Web of Science (WoS) Core Collection. It combines various bibliometric indicators with international benchmark data across disciplines and years. The disciplinary classification in this section adopts the ESI classification model, which is a relatively broad classification system based on journals, comprising 22 disciplines in natural sciences and social sciences. Each journal is assigned to only one of the 22 ESI disciplines. The database was updated on July 26, 2024, with Web of Science data current up to July 31, 2024, and the retrieval date was August 18, 2024.

[5]A total of 295 journals from Chinese mainland (excluding Hong Kong SAR, Macao SAR, and Taiwan regions) were identified in the InCites database, among which 240 journals with CN numbers were included in the statistical scope.

their proportion remains relatively low compared to the global share of papers by Chinese authors (figure 2.6).

Over the decade from 2014 to 2023, the number of SCI papers published by Chinese authors showed continuous growth, with 2023 marking the first instance of a slight decline in publication volume. During the same period, the number of papers published in Chinese SCI journals has maintained steady growth since 2017. In 2023, the number of SCI papers by Chinese authors was 19.27 times that of papers published in Chinese SCI journals, indicating a widening gap compared to the 2014 ratio of 9.45 times (figure 2.7).

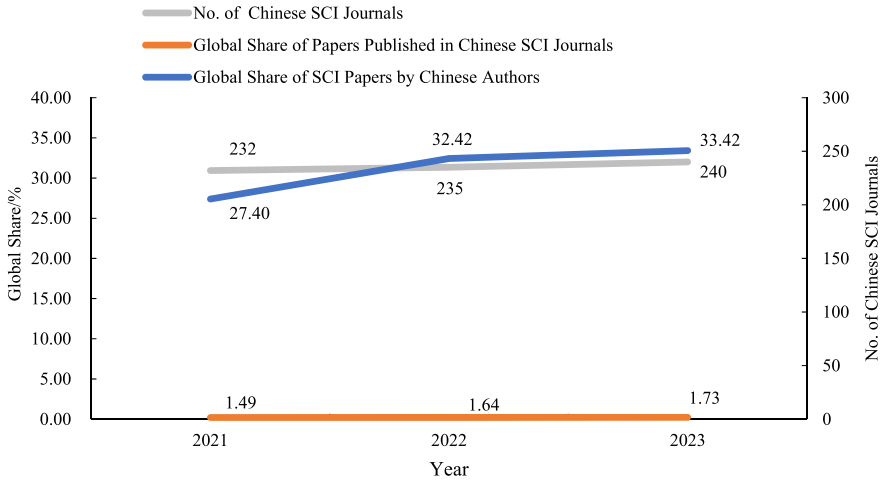


FIG. 2.6 – Number of Chinese SCI journals, global share of papers published in Chinese SCI journals, and global share of SCI papers by Chinese authors, 2021–2023.

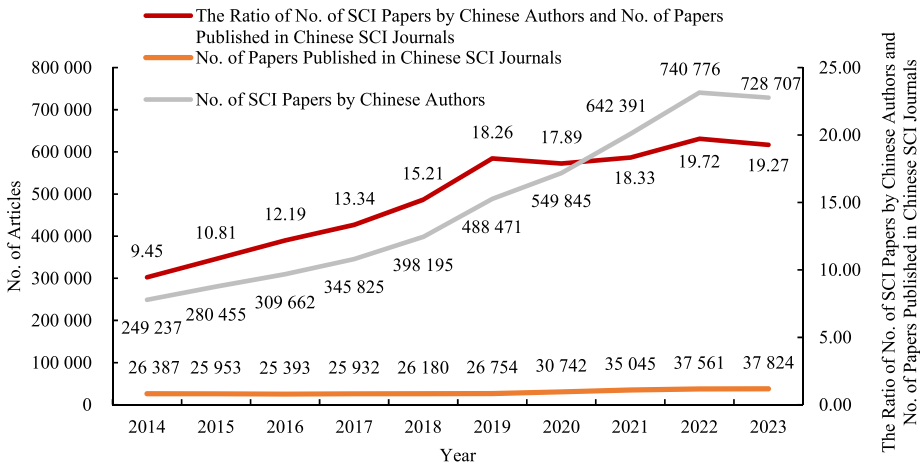


FIG. 2.7 – Number of SCI papers by Chinese authors, number of papers published in Chinese SCI journals, and their ratio, 2014–2023.

The proportion of papers authored by overseas authors in Chinese SCI journals reached its peak in 2020 at 19.76%, followed by a slight annual decline, reaching 17.49% in 2023. An analysis of the publication trends by overseas authors in Chinese journals from a disciplinary perspective reveals that the total publication volume across all disciplines remains relatively low. Only six disciplines exceeded 500 papers in 2023: Materials Science (1292 papers), Physics (844 papers), Engineering & Technology (794 papers), Chemistry (645 papers), Geosciences (576 papers), and Plant & Animal Science (541 papers). Among these, Materials Science, Agricultural Sciences, and Clinical Medicine saw a decline of over 50 papers by overseas authors in 2023 compared to the previous year (table 2.4).

As shown in table 2.5, in 2023, the discipline with the highest proportion of papers published in Chinese SCI journals relative to global SCI journals in the same field was Physics (5.24%). Meanwhile, the proportion of SCI papers by Chinese authors relative to global SCI journals in their respective disciplines exceeded 10% across all fields, with ten disciplines surpassing 30%. Notably, Chinese authors accounted for 51.70% of global SCI journals in Materials Science, while the proportions in Engineering & Technology, Computer Science, and Geosciences all exceeded 40%.

In 2023, Physics had the highest proportion of papers by Chinese authors published in Chinese SCI journals relative to their total SCI publications, at 12.89%. Other disciplines with proportions exceeding 5% were, in descending order: Geosciences (8.89%), Space Science (6.74%), Chemistry (6.71%), Materials Science (6.69%), Plant & Animal Science (5.48%), and Mathematics (5.12%).

Regarding the sources of papers published in Chinese SCI journals, Chinese authors serve as the primary contributing group. Among these, seven disciplines exhibit contribution rates exceeding 90% (two papers in the field of Social Sciences were excluded from statistical calculations due to the small number). Within these disciplines, Chemistry, Physics, and Geosciences demonstrate relatively high proportions in both the volume of papers published in Chinese SCI journals and the share of SCI papers by Chinese authors within global SCI publications. Computer Science, Pharmacology & Toxicology, and Biology & Biochemistry show a high proportion of SCI papers by Chinese authors globally, while the share of papers published in Chinese SCI journals remains relatively low. Microbiology displays relatively low proportions in both the volume of papers in Chinese SCI journals and the global share of SCI papers by Chinese authors. The discipline of Immunology records the lowest proportion of papers by Chinese authors in Chinese SCI journals, at 56.60%.

2.2.1.2 Papers in Chinese SCI Journals Demonstrate Outstanding Academic Impact

1) Proportion of Citations Received Exceeds Proportion of Publication Volume

In 2023, the total citations received by SCI papers authored by Chinese researchers (2 070 225 citations) accounted for 42.91% of the global citations received by all SCI papers (4 824 572 citations). The citations received by papers published in Chinese SCI journals totaled 152 121, representing 3.15% of the global total citations for SCI papers during the same period. This proportion is higher than the share of papers published by Chinese SCI journals in the global SCI publication volume (1.73%), as detailed in table 2.6.

The proportion of citations received by papers authored by Chinese researchers in Chinese SCI journals (87.41%) was slightly lower than the proportion of their published

Tab. 2.4 – No. of papers published by overseas authors in Chinese SCI journals by discipline, 2014–2023.

No.	Discipline	No. of papers published by overseas authors in Chinese SCI journals									
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	Agricultural Sciences	102	134	123	174	201	211	247	279	360	308
2	Biology & Biochemistry	108	74	81	89	94	87	92	102	114	112
3	Chemistry	231	259	257	282	360	389	563	701	577	645
4	Clinical Medicine	164	167	186	178	215	231	227	239	284	233
5	Computer Science	130	144	168	164	163	186	203	173	205	219
6	Economics & Business	0	0	0	0	1	0	0	0	0	0
7	Engineering	273	303	371	435	490	644	742	813	826	794
8	Environment/Ecology	165	172	206	260	266	272	304	347	376	334
9	Geosciences	278	358	371	398	482	475	540	573	589	576
10	Immunology	32	40	81	106	94	88	130	98	81	99
11	Materials Science	297	335	323	387	448	630	901	1179	1355	1292
12	Mathematics	150	148	138	163	184	163	186	157	143	153
13	Microbiology	0	7	5	19	13	18	25	16	8	19
14	Molecular Biology & Genetics	73	89	106	107	123	122	182	181	163	153
15	Multidisciplinary	0	2	0	1	2	1	4	5	4	8
16	Neuroscience & Behavior	43	56	46	70	80	89	116	102	106	117
17	Pharmacology & Toxicology	50	58	67	80	96	109	148	141	117	114
18	Physics	484	515	528	612	723	719	866	887	881	844
19	Plant & Animal Science	251	269	288	342	385	434	559	541	550	541
20	Psychiatry/Psychology	0	0	0	0	0	0	0	1	0	0
21	Social Sciences, general	0	0	0	0	1	1	0	1	1	1
22	Space Science	24	38	49	35	43	58	39	94	62	54
	Total	2855	3168	3394	3902	4464	4927	6074	6630	6802	6616

Note: Data from 2014 to 2022 are sourced from the *Blue Book on China's Scientific Journal Development (2023)*.

Data retrieval method—InCites database: select "Research Area"; Time period "2023"; the discipline classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; for domestic/international collaborative papers, select "International". Data on Chinese SCI journals and publications by international authors in Chinese SCI journals were sequentially collected. The ranking is ordered by discipline English names.

TAB. 2.5 – Number of global SCI Papers, papers in Chinese SCI journals, SCI papers by Chinese authors, and papers by Chinese authors in Chinese SCI journals by discipline, 2023.

No.	Discipline	No. of global SCI papers (A)	No. of papers in Chinese SCI journals (B)	% ($B/A \times 100\%$)	No. of SCI papers by Chinese authors (C)	% ($C/A \times 100\%$)	No. of papers by Chinese authors in Chinese SCI journals (D)	% ($D/C \times 100\%$)	% ($D/B \times 100\%$)
1	Agricultural Sciences	70 086	1331	1.90	25 628	36.57	1132	4.42	85.05
2	Biology & Biochemistry	85 885	878	1.02	24 695	28.75	823	3.33	93.74
3	Chemistry	228 034	6356	2.79	90 293	39.60	6057	6.71	95.30
4	Clinical Medicine	365 187	1721	0.47	76 965	21.08	1424	1.85	82.74
5	Computer Science	69 861	1087	1.56	31 899	45.66	1007	3.16	92.64
6	Economics & Business	42 688	0	0.00	10 142	23.76	0	0.00	—
7	Engineering	285 733	4251	1.49	138 175	48.36	3627	2.62	85.32
8	Environment/Ecology	106 942	1461	1.37	40 443	37.82	1200	2.97	82.14
9	Geosciences	69 951	3044	4.35	31 106	44.47	2764	8.89	90.80
10	Immunology	32 205	212	0.66	8491	26.37	120	1.41	56.60
11	Materials Science	165 910	6548	3.95	85 783	51.70	5738	6.69	87.63
12	Mathematics	56 328	983	1.75	16 831	29.88	862	5.12	87.69
13	Microbiology	30 987	98	0.32	8679	28.01	96	1.11	97.96
14	Molecular Biology & Genetics	45 638	761	1.67	16 416	35.97	682	4.15	89.62
15	Multidisciplinary	3406	13	0.38	798	23.43	11	1.38	84.62
16	Neuroscience & Behavior	52 568	612	1.16	10 970	20.87	435	3.97	71.08
17	Pharmacology & Toxicology	59 293	853	1.44	19 221	32.42	775	4.03	90.86
18	Physics	108 501	5684	5.24	40 297	37.14	5193	12.89	91.36
19	Plant & Animal Science	91 471	1645	1.80	23 013	25.16	1261	5.48	76.66
20	Psychiatry/Psychology	57 693	0	0.00	8582	14.88	0	0.00	—
21	Social Sciences, general	134 785	2	0.00	16 867	12.51	2	0.01	100.00
22	Space Science	17 311	284	1.64	3413	19.72	230	6.74	80.99
	Total	2 180 463	37 824	1.73	728 707	33.42	33 439	4.59	88.41

Note: Retrieval method — Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for Global, Chinese SCI journals, Chinese authors, and Chinese authors in Chinese SCI journals. The ranking is ordered by discipline English names.

TAB. 2.6 – Total cites of global SCI papers, papers in Chinese SCI journals, SCI papers by Chinese authors, and papers by Chinese authors in Chinese SCI journals by discipline, 2023.

No.	Discipline	Total Cites of Global SCI Papers (A)	Total Cites of Papers in Chinese SCI Journals (B)	% ($B/A \times 100\%$)	Total Cites of SCI Papers by Chinese Authors (C)	% ($C/A \times 100\%$)	Total Cites of Papers by Chinese Authors in Chinese SCI Journals (D)	% ($D/C \times 100\%$)	% ($D/B \times 100\%$)
1	Agricultural Sciences	145 799	4985	3.42	70 525	48.37	4278	6.07	85.82
2	Biology & Biochemistry	206 651	1944	0.94	63 751	30.85	1809	2.84	93.06
3	Chemistry	657 574	27 379	4.16	321 790	48.94	25 242	7.84	92.19
4	Clinical Medicine	627 490	3980	0.63	125 344	19.98	3088	2.46	77.59
5	Computer Science	152 676	2756	1.81	84 753	55.51	2515	2.97	91.26
6	Economics & Business	78 981	0	0.00	30 323	38.39	0	0.00	—
7	Engineering	742 355	16 175	2.18	418 802	56.42	13 672	3.26	84.53
8	Environment/Ecology	267 664	4222	1.58	125 162	46.76	3534	2.82	83.70
9	Geosciences	137 050	7795	5.69	72 169	52.66	6912	9.58	88.67
10	Immunology	76 146	949	1.25	19 627	25.78	437	2.23	46.05
11	Materials Science	597 380	42 921	7.18	377 549	63.20	37 518	9.94	87.41
12	Mathematics	50 480	664	1.32	18 205	36.06	592	3.25	89.16
13	Microbiology	66 209	261	0.39	18 909	28.56	240	1.27	91.95
14	Molecular Biology & Genetics	129 596	7590	5.86	45 391	35.03	6922	15.25	91.20
15	Multidisciplinary	7330	124	1.69	2648	36.13	120	4.53	96.77
16	Neuroscience & Behavior	102 338	2615	2.56	20 413	19.95	1868	9.15	71.43
17	Pharmacology & Toxicology	126 099	3617	2.87	43 862	34.78	3137	7.15	86.73
18	Physics	238 904	17 486	7.32	103 606	43.37	15 470	14.93	88.47
19	Plant & Animal Science	129 459	6057	4.68	44 634	34.48	5062	11.34	83.57
20	Psychiatry/Psychology	71 227	0	0.00	11 645	16.35	0	0.00	—
21	Social Sciences, general	155 267	11	0.01	39 411	25.38	11	0.03	100.00
22	Space Science	57 897	590	1.02	11 706	20.22	538	4.60	91.19
	Total	4 824 572	152 121	3.15	2 070 225	42.91	132 965	6.42	87.41

Note: Retrieval method — Select "research area" in InCites dataset; time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for global, Chinese SCI journals, Chinese authors, and Chinese authors in Chinese SCI journals.
The ranking is ordered by discipline English names. "Economics & Business" and "Psychiatry/Psychology" are excluded as Chinese SCI journals in these fields recorded no citations.

papers (88.41%). Specifically, 11 disciplines showed a lower proportion of citations compared to their proportion of published papers, with Immunology (212 published papers) exhibiting a difference exceeding 10 percentage points. Conversely, 8 disciplines had a higher proportion of citations than their proportion of published papers, with Multidisciplinary (13 published papers) and Space Science (284 published papers) showing differences exceeding 10 percentage points, and Plant & Animal Science (1645 published papers) showing a difference of 6.91 percentage points.

2) Both Citation Impact and Proportion of Cited Papers Exceed Global Averages

In 2023, the Citation Impact[6] of papers published in Chinese SCI journals was 4.02, and the Citation Impact of SCI papers authored by Chinese researchers was 2.84. Both figures exceeded the global average Citation Impact for SCI papers published during the same period (2.21). Since 2021, the Citation Impact of papers in Chinese SCI journals has surpassed that of SCI papers by Chinese authors, with the differences between the two being 0.52, 1.20, and 1.18 in 2021, 2022, and 2023, respectively (figure 2.8).

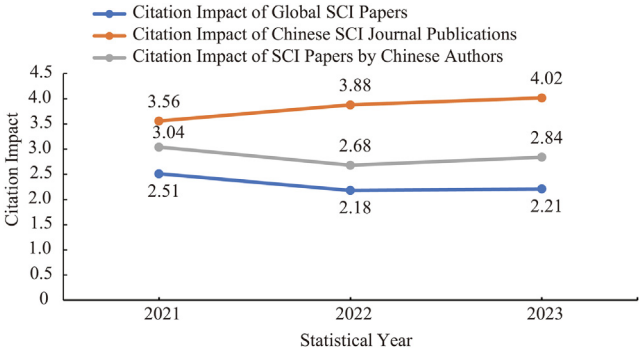


FIG. 2.8 – Citation impact of global SCI papers, Chinese SCI journals, and SCI papers by Chinese authors, 2021–2023. Data for 2021, 2022, and 2023 are sourced from the *Blue Book on China's Scientific Journal Development (2022)* and the *Blue Book on China's Scientific Journal Development* (2023), respectively. Data Retrieval Method: Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for global, Chinese SCI journals, and Chinese authors.

As shown in table 2.7, the citation impact of papers in Chinese SCI journals exceeds the global average in 17 disciplines, including: Multidisciplinary, Molecular Biology & Genetics, Social Sciences, Materials Science, Neuroscience & Behavior, Plant & Animal Science, Pharmacology & Toxicology, Immunology, Agricultural Sciences, Chemistry, Engineering & Technology, Physics, Geosciences, Clinical Medicine, Microbiology,

[6]Citation Impact is defined as the total number of citations received by a set of publications divided by the total number of publications, reflecting the average citation count per article within that set, *i.e.*, the average number of citations per paper.

Environment/Ecology, and Computer Science. Compared with 2022, 16 of these disciplines have maintained their leading position for two consecutive years, with only Microbiology lagging behind the global average in 2022. Regarding the citation impact of SCI papers by Chinese authors, 18 disciplines surpass their respective global averages: Social Sciences, Multidisciplinary, Economics & Business, Materials Science, Chemistry, Agricultural Sciences, Environment/Ecology, Plant & Animal Science, Computer Science, Engineering & Technology, Physics, Geosciences, Mathematics, Biology & Biochemistry, Pharmacology & Toxicology, Psychiatry/Psychology, Space Science, and Microbiology.

A comparative analysis reveals that 13 disciplines demonstrate superior citation impact in both Chinese SCI journals and papers by Chinese authors compared to global averages: Social Sciences, Multidisciplinary, Materials Science, Plant & Animal Science, Pharmacology & Toxicology, Agricultural Sciences, Chemistry, Engineering & Technology, Physics, Geosciences, Microbiology, Environment/Ecology, and Computer Science. Notably, in Molecular Biology & Genetics, Neuroscience & Behavior, Immunology, and Clinical Medicine, the citation impact of papers by Chinese authors falls below global averages, while Chinese SCl jounals in these fields maintain higher citation impact than their global counterparts. Conversely. in Biology & Biochemistry, Mathematics, Psychiatry/Psychology, Space Science, and Economics & Business, Chinese SCI journals show lower citation impact than global averages, while papers by Chinese authors in these fields exceed global standards. Particularly noteworthy is that papers in Chinese SCI journals from Psychiatry/Psychology and Economics & Business received no citations, resulting inunavailable citation impact metrics.

Chinese authors publishing in Chinese SCI journals in the following 15 disciplines demonstrated higher citation impact compared to their overall SCI publications: Multidisciplinary, Molecular Biology & Genetics, Social Sciences, Neuroscience & Behavior, Materials Science, Plant & Animal Science, Pharmacology & Toxicology, Immunology, Agricultural Sciences, Engineering & Technology, Chemistry, Clinical Medicine, Physics, Microbiology, and Geosciences. This indicates that Chinese SCI journals in these 15 disciplines have attracted higher-quality research from Chinese authors.

In 2023, the proportion of cited papers among Chinese SCI journal publications was 68.76%, while the proportion of cited SCI papers by Chinese authors was 65.72%, both exceeding the global average for SCI papers (60.25%). At the disciplinary level, Chinese SCI journals outperformed their global counterparts in the proportion of cited papers across 16 disciplines, while Chinese authors surpassed global averages in 20 disciplines.

3) Outstanding Performance in Category Normalized Citation Impact (CNCI)

In 2023, the CNCI[7] of Chinese SCI journal papers reached 1.49, and that of SCI papers by Chinese authors was 1.20. Compared to 2022, when Chinese SCI journals had a CNCI of 1.51 and Chinese authors' SCI papers had a CNCI of 1.16, the impact of Chinese SCI journals showed a slight decline in 2023.

[7]Category Normalized Citation Impact (CNCI) reflects the academic influence of a paper through the number of citations it receives in subsequent work. Since the rate at which citations accumulate over time varies across disciplines, the counts need to be "normalized" by subject category and publication year before being averaged. The global average consistently serves as the reference benchmark, set at 1.00.

TAB. 2.7 – Citation impact and proportion of cited papers for global SCI Papers, Chinese SCI journal papers, SCI papers by Chinese authors, and papers by Chinese authors in Chinese SCI journals by discipline, 2023.

No.	Discipline	Citation impact				% of cited papers			
		Global SCI papers	Chinese SCI Journal Papers	SCI Papers by Chinese Authors	Papers by Chinese Authors in Chinese SCI Journals	Global SCI papers	Chinese SCI Journal Papers	SCI Papers by Chinese Authors	Papers by Chinese Authors in Chinese SCI Journals
1	Agricultural Sciences	2.08	3.75	2.75	3.78	64.18	84.75	73.49	84.81
2	Biology & Biochemistry	2.41	2.21	2.58	2.20	66.12	60.02	66.87	59.05
3	Chemistry	2.88	4.31	3.56	4.17	68.95	68.66	72.17	67.79
4	Clinical Medicine	1.72	2.31	1.63	2.17	53.60	61.59	53.94	60.25
5	Computer Science	2.19	2.54	2.66	2.50	56.32	60.53	60.25	60.08
6	Economics & Business	1.85	0.00	2.99	0.00	53.12	0.00	61.03	0.00
7	Engineering	2.60	3.80	3.03	3.77	64.09	71.42	66.97	70.44
8	Environment/Ecology	2.50	2.89	3.09	2.95	66.83	70.70	71.49	71.42
9	Geosciences	1.96	2.56	2.32	2.50	61.07	61.53	64.37	60.35
10	Immunology	2.36	4.48	2.31	3.64	65.30	89.15	66.91	90.83
11	Materials Science	3.60	6.55	4.40	6.54	72.03	76.74	75.27	75.32
12	Mathematics	0.90	0.68	1.08	0.69	37.83	29.40	40.05	29.93
13	Microbiology	2.14	2.66	2.18	2.50	65.11	73.47	66.29	72.92
14	Molecular Biology & Genetics	2.84	9.97	2.77	10.15	65.00	89.75	65.05	89.44
15	Multidisciplinary	2.15	9.54	3.32	10.91	54.96	84.62	61.28	81.82
16	Neuroscience & Behavior	1.95	4.27	1.86	4.29	61.30	82.84	61.23	81.84
17	Pharmacology & Toxicology	2.13	4.24	2.28	4.05	63.51	76.79	65.42	75.74

Tab. 2.7 – (continued).

No.	Discipline	Citation impact				% of cited papers			
		Global SCI papers	Chinese SCI Journal Papers	SCI Papers by Chinese Authors	Papers by Chinese Authors in Chinese SCI Journals	Global SCI papers	Chinese SCI Journal Papers	SCI Papers by Chinese Authors	Papers by Chinese Authors in Chinese SCI Journals
18	Physics	2.20	3.08	2.57	2.98	60.70	61.44	62.72	59.97
19	Plant & Animal Science	1.42	3.68	1.94	4.01	53.77	76.90	63.28	79.86
20	Psychiatry/Psychology	1.23	0.00	1.36	0.00	49.85	0.00	52.98	0.00
21	Social Sciences, general	1.15	5.50	2.34	5.50	44.58	100.00	59.16	100.00
22	Space Science	3.34	2.08	3.43	2.34	71.34	48.59	71.17	47.83
	Total	2.21	4.02	2.84	3.98	60.25	68.76	65.72	67.73

Note: Retrieval method — Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for global, Chinese SCI journals, Chinese authors, and Chinese authors in Chinese SCI journals.

The citation impact data and proportion of cited papers for all disciplines are calculated as baseline values.

The ranking is ordered by discipline English names.

Regarding the CNCI of Chinese SCI journal papers, 17 disciplines demonstrated impact levels above the disciplinary average. For SCI papers by Chinese authors, 18 disciplines exceeded their respective disciplinary averages.

The CNCI of papers by Chinese authors published in Chinese SCI journals was relatively close to the overall CNCI of Chinese SCI journals, with minimal differences observed across 18 disciplines. In Immunology, the CNCI of papers by Chinese authors in Chinese SCI journals was 0.14 lower than the overall CNCI of Chinese SCI journals.

In seven disciplines—Multidisciplinary, Plant & Animal Science, Neuroscience & Behavior, Molecular Biology & Genetics, Agricultural Sciences, Materials Science, and Social Sciences—Chinese authors achieved higher citation impact when publishing in Chinese SCI journals. Additionally, the performance of Chinese SCI journals in these fields surpassed that of SCI papers by Chinese authors overall. The CNCI ranked in descending order (with the first being at least equal to the second): papers by Chinese authors in Chinese SCI journals, Chinese SCI journals overall, and SCI papers by Chinese authors overall (figure 2.9).

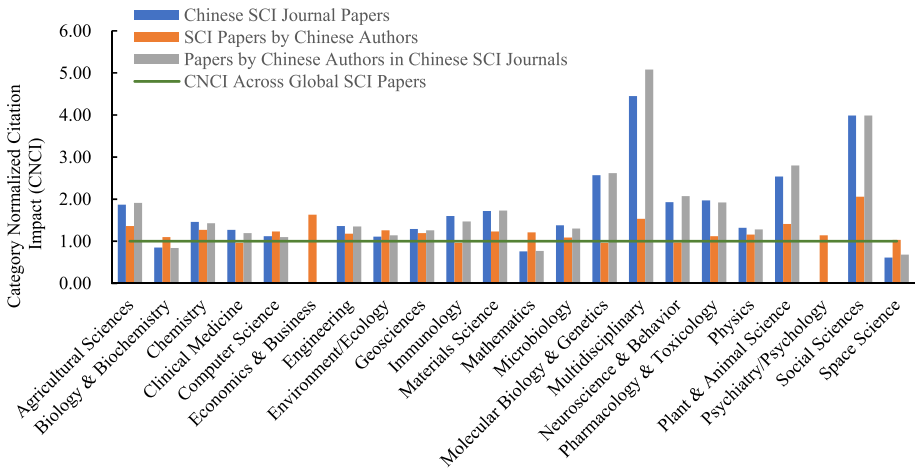


Fig. 2.9 – Comparison of Category Normalized Citation Impact (CNCI) across global SCI papers, Chinese SCI journal papers, SCI papers by Chinese authors, and papers by Chinese authors in Chinese SCI journals by discipline, 2023. Retrieval method: Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for global, Chinese SCI journals, Chinese authors, and Chinese authors in Chinese SCI journals. For the two disciplines "Economics & Business" and "Psychiatry/Psychology", no papers were published in Chinese SCI journals, resulting in a Category Normalized Citation Impact (CNCI) of 0 for both Chinese SCI journal publications and papers by Chinese authors in Chinese SCI journals.

4) Higher Proportion of Q1 Papers in Chinese SCI Journals

In 2023, Chinese SCI journals published 24 849 Q1 papers, representing 2.19% of the global total of Q1 papers (1 136 887). Chinese authors contributed 421 199 Q1 papers,

representing 37.05% of the global Q1 articles. Over the decade from 2014 to 2023, the number of Q1 papers in Chinese SCI journals showed a significant upward trend. The proportion of Q1 papers increased from 6.28% in 2014 to 65.70% in 2023, indicating that over 60% of papers in Chinese SCI journals are now in the first quartile. This demonstrates a notable improvement in the academic quality of Chinese SCI journals over the past ten years (figure 2.10).

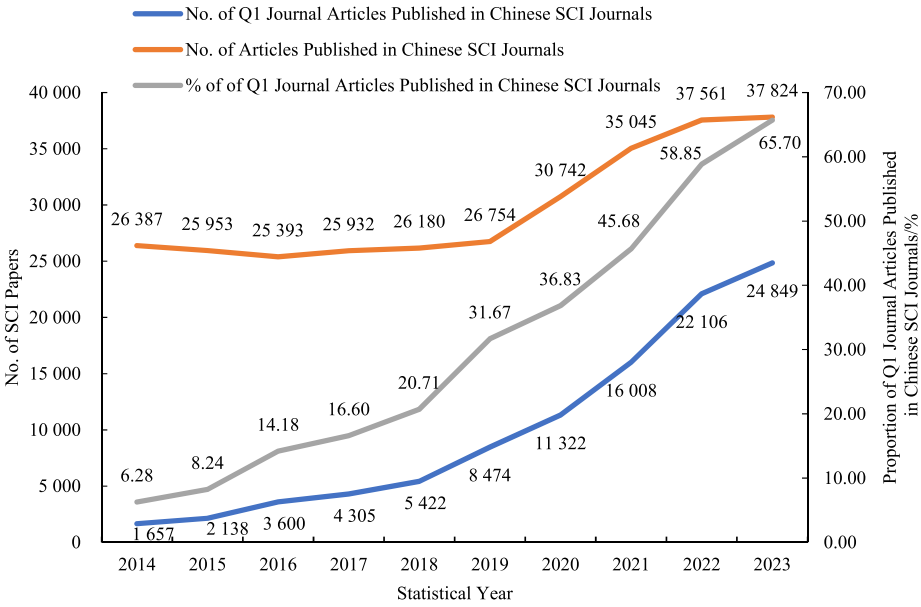


FIG. 2.10 – Number of Q1 Papers in Chinese SCI Journals, 2014–2023. Data for 2014–2022 are sourced from the *Blue Book on China's Scientific Journal Development (2020), Blue Book on China's Scientific Journal Development (2021), Blue Book on China's Scientific Journal Development (2022), and Blue Book on China's Scientific Journal Development (2023)*. Data for 2023 are retrieved from the InCites database using the following criteria: Research Area, Publication Window: 2023, Subject Category Scheme: ESI, Document Types: Article and Review. Process: Publications from Chinese SCI journals were sequentially collected based on the above filters.

In 2023, 160 Chinese SCI journals (66.67%) were ranked as Q1 journals, constituting 3.45% of the global total of Q1 journals (4088). As shown in table 2.8, nine disciplines had Chinese SCI journals with a global share of Q1 papers greater than or equal to 2%, listed in descending order as: Physics (7.57%), Materials Science (4.92%), Geosciences (4.72%), Molecular Biology & Genetics (3.20%), Plant & Animal Science (2.91%), Chemistry (2.78%), Agricultural Sciences (2.72%), Neuroscience & Behavior (2.61%), and Engineering & Technology (2.00%). Regarding the contribution to Q1 papers in Chinese SCI journals, Chinese authors had a higher proportion of papers published in Chinese Q1 journals. Excluding two disciplines without any Q1 papers, Chinese authors contributed over 50% of the papers in the remaining 20 disciplines.

TAB. 2.8 – No. of papers published in global Q1 SCI journals, Chinese Q1 SCI journals, q1 SCI journal papers by Chinese authors, and papers by Chinese authors in Chinese Q1 SCI journals by discipline, 2023.

No.	Discipline	No. of Papers Published in Global Q1 SCI Journals (A)	No. of Papers Published in Chinese Q1 SCI Journals (B)	% ($B/A \times 100\%$)	No. of Q1 SCI Journal Papers by Chinese Authors (C)	% ($C/A \times 100\%$)	Ratio (C/B)	No. of Papers by Chinese Authors in Chinese Q1 SCI Journals (D)	% ($D/B \times 100\%$)
1	Agricultural Sciences	46 922	1278	2.72	21 111	44.99	16.52	1083	84.74
2	Biology & Biochemistry	44 800	577	1.29	13 604	30.37	23.58	532	92.20
3	Chemistry	108 123	3001	2.78	47 170	43.63	15.72	2784	92.77
4	Clinical Medicine	172 482	1150	0.67	30 776	17.84	26.76	941	81.83
5	Computer Science	37 129	598	1.61	19 237	51.81	32.17	541	90.47
6	Economics & Business	26 595	0	0.00	7002	26.33	—	0	—
7	Engineering	166 036	3321	2.00	91 311	54.99	27.50	2811	84.64
8	Environment/Ecology	47 721	773	1.62	20 753	43.49	26.85	640	82.79
9	Geosciences	39 482	1863	4.72	20 355	51.56	10.93	1622	87.06
10	Immunology	18 840	212	1.13	4421	23.47	20.85	120	56.60
11	Materials Science	102 203	5033	4.92	59 855	58.56	11.89	4309	85.61
12	Mathematics	28 199	498	1.77	9595	34.03	19.27	448	89.96
13	Microbiology	9129	14	0.15	2599	28.47	185.64	13	92.86
14	Molecular Biology & Genetics	22 248	713	3.20	7531	33.85	10.56	648	90.88
15	Multidisciplinary	2844	13	0.46	699	24.58	53.77	11	84.62
16	Neuroscience & Behavior	23 412	612	2.61	3849	16.44	6.29	435	71.08
17	Pharmacology & Toxicology	35 916	711	1.98	12 696	35.35	17.86	638	89.73
18	Physics	39 163	2965	7.57	15 016	38.34	5.06	2589	87.32
19	Plant & Animal Science	51 946	1512	2.91	17 819	34.30	11.79	1171	77.45
20	Psychiatry/Psychology	27 134	0	0.00	3567	13.15	—	0	—
21	Social Sciences, general	72 674	2	0.00	9537	13.12	4768.50	2	100.00
22	Space Science	13 889	3	0.02	2696	19.41	898.67	3	100.00
	Total	1 136 887	24 849	2.19	421 199	37.05	16.95	21 341	85.88

Note: Retrieval method — Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for global, Chinese SCI journals, Chinese authors, and Chinese authors in Chinese SCI journals.
The ranking is ordered by discipline English names. Economics & Business and Psychiatry/Psychology are excluded as no papers were published in Chinese Q1 SCI journals in these fields.

The proportion of Q1 journal papers published by Chinese authors relative to the global total significantly exceeds the corresponding proportion for Chinese SCI-indexed journals in all disciplines. Among these, four disciplines have surpassed the 50% mark: Materials Science (58.56%), Engineering & Technology (54.99%), Computer Science (51.81%), and Geoscience (51.56%). Within these four disciplines, Chinese SCI-indexed journals in Materials Science and Geoscience account for a relatively high share of global Q1 publications, whereas those in Engineering & Technology and Computer Science still demonstrate comparatively weaker international presence.

2.2.1.3 Internationally Collaborative Papers in Chinese SCI Journals

In 2023, the proportion of internationally collaborative papers published in Chinese SCI journals was 17.49%, which was 8.66 percentage points lower than the global average for internationally collaborative papers (26.15%). During the same period, the percentage of internationally collaborative papers by Chinese authors was 19.41%, falling 6.74 percentage points below the global level.

As shown in table 2.9, the proportion of internationally collaborative papers in Chinese SCI journals exceeded the global average for their respective disciplines in four fields: Multidisciplinary, Social Sciences, Immunology, and Plant & Animal Science. A comparative analysis across disciplines reveals that the proportion of internationally collaborative papers by Chinese authors published in Chinese SCI journals is generally consistent with the overall proportion of internationally collaborative papers in Chinese SCI journals.

When comprehensively considering both publication volume and the proportion of internationally collaborative papers, Chinese SCI journals in Immunology and Plant & Animal Science demonstrate more prominent international collaboration, with their proportions of internationally collaborative papers exceeding both the global average and the proportion of internationally collaborative SCI papers by Chinese authors.

2.2.2 International Comparison of the Academic Impact of Papers Published in Chinese SCI Journals

A comparative analysis was conducted on the publication performance of domestic journals from the top 15 countries/regions by SCI paper output, aiming to objectively present the international competitiveness of Chinese SCI journals across different dimensions.

2.2.2.1 Comparative Analysis of Academic Impact of Journals from Top 15 SCI Paper-Producing Countries

Table 2.10 compares the number of SCI journals, published papers, total cites, citation impact, proportion of cited papers, and CNCI among the top 15 SCI paper-producing countries. Chinese authors ranked first in the number of published papers, while Chinese SCI journals ranked 6th in quantity, 5th in published papers, and 1st in both citation impact and CNCI. U.S. authors ranked 2nd in published papers, with U.S. SCI journals leading in both journal count and published papers, while ranking 5th in citation impact

TAB. 2.9 – Proportion of internationally collaborative papers in global SCI journals, Chinese SCI journals, SCI papers by Chinese authors, and papers by Chinese authors in Chinese SCI journals by discipline, 2023.

No.	Discipline	% of Int'l. collaborative papers in global SCI journals (*A*)	% of Int'l. collaborative papers in Chinese SCI journals (*B*)	*D*-Value % (*B*–*A*)	% of Int'l. collaborative SCI papers by Chinese authors (*C*)	*D*-Value % (*C*–*A*)	% of Int'l. collaborative SCI papers by Chinese authors in Chinese SCI journals (*D*)	*D*-Value % (*D*–*B*)
1	Agricultural Sciences	24.23	23.14	–1.09	19.32	–4.91	20.41	–2.73
2	Biology & Biochemistry	26.61	12.76	–13.85	17.58	–9.03	11.54	–1.22
3	Chemistry	22.29	10.15	–12.14	14.70	–7.59	9.00	–1.15
4	Clinical Medicine	22.77	13.54	–9.23	12.23	–10.54	10.32	–3.22
5	Computer Science	29.97	20.15	–9.82	28.90	–1.07	18.17	–1.98
6	Economics & Business	37.91	0.00	–37.91	36.69	–1.22	0.00	0.00
7	Engineering	24.31	18.68	–5.63	19.92	–4.39	17.18	–1.50
8	Environment/Ecology	31.35	22.86	–8.49	23.79	–7.56	20.25	–2.61
9	Geosciences	32.95	18.92	–14.03	25.63	–7.32	17.58	–1.34
10	Immunology	28.03	46.70	18.67	13.93	–14.10	40.00	–6.70
11	Materials Science	23.63	19.73	–3.90	17.85	–5.78	17.48	–2.25
12	Mathematics	30.86	15.56	–15.30	22.38	–8.48	14.73	–0.83
13	Microbiology	28.12	19.39	–8.73	18.31	–9.81	18.75	–0.64
14	Molecular Biology & Genetics	27.02	20.11	–6.91	16.27	–10.75	19.21	–0.90
15	Multidisciplinary	31.97	61.54	29.57	23.31	–8.66	63.64	2.10
16	Neuroscience & Behavior	28.19	19.12	–9.07	18.55	–9.64	16.32	–2.80
17	Pharmacology & Toxicology	23.38	13.36	–10.02	10.58	–12.80	11.74	–1.62
18	Physics	28.32	14.85	–13.47	20.87	–7.45	13.38	–1.47
19	Plant & Animal Science	30.05	32.89	2.84	21.74	–8.31	29.42	–3.47
20	Psychiatry/Psychology	28.11	0.00	–28.11	26.84	–1.27	0.00	0.00
21	Social Sciences, general	24.06	50.00	25.94	30.25	6.19	50.00	0.00
22	Space Science	57.47	19.01	–38.46	52.24	–5.23	17.39	–1.62
	Total	26.15	17.49	–8.66	19.41	–6.74	15.42	–2.07

Note: Retrieval method — Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for global, Chinese SCI journals, Chinese authors, and Chinese authors in Chinese SCI journals.
The ranking is ordered by discipline English names.

TAB. 2.10 – Impact of published papers from Top 15 SCI paper-producing countries in 2023.

No.	Country	No. of SCI papers by country's authors (A)	No. of SCI journals	No. of papers in SCI journals (B)	Ratio (B/A)	Total cites of SCI journals	Citation impact	% of cited papers	CNCI
1	China	728 707	240	37 824	0.05	152 121	4.02	68.76	1.49
2	US	416 920	4161	653 872	1.57	1 498 266	2.29	60.21	1.09
3	India	123 519	96	12 084	0.10	7613	0.63	32.12	0.30
4	Germany	123 374	767	118 910	0.96	299 590	2.52	59.36	0.96
5	UK	122 594	3017	514 862	4.20	1 253 250	2.43	63.05	1.12
6	Italy	92 822	119	16 034	0.17	25 671	1.60	49.89	0.85
7	Japan	84 948	252	20 423	0.24	20 395	1.00	44.22	0.50
8	Canada	80 125	120	8815	0.11	10 447	1.19	47.99	0.70
9	France	77 701	190	20 197	0.26	37 539	1.86	56.31	0.82
10	Australia	76 039	155	10 147	0.13	14 824	1.46	50.25	0.82
11	Spain	74 967	127	6003	0.08	5981	1.00	36.05	0.64
12	Republic of Korea	74 778	148	14 806	0.20	23 994	1.62	54.22	0.69
13	Brazil	53 615	118	14 261	0.27	18 812	1.32	44.06	0.52
14	Turkey	48 268	56	4442	0.09	3006	0.68	32.82	0.38
15	Netherlands	47 371	973	222 985	4.71	666 695	2.99	70.57	1.14

Note: Retrieval method — Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for authors from each country and SCI journals from each country.
Arranged in descending order by the number of papers published by authors from each country.

and 4th in CNCI. Indian authors ranked 3rd in published papers, but with fewer than 100 SCI journals, India has yet to establish a significant influence. German authors ranked 4th in the number of published papers, SCI journals, and SCI papers, while ranking 3rd in citation impact and 5th in CNCI. British authors ranked 5th in published papers, with British SCI journals ranking 2nd in both journal count and published papers, 3rd in CNCI, and 4th in citation impact. Dutch authors published fewer than 50 000 papers, yet Dutch SCI journals ranked 3rd in both journal count and published papers, and 2nd in both citation impact and CNCI.

Regarding the ratio of papers published in domestic SCI journals to papers published by domestic authors: Three countries had more papers published in their domestic journals than by their authors: the Netherlands (4.71), the UK (4.20), and the U.S. (1.57). Seven countries had domestic journal papers representing less than 20% of their authors' papers: China (0.05), Spain (0.08), Turkey (0.09), India (0.10), Canada (0.11), Australia (0.13), and Italy (0.17).

Key findings:

① The top three countries by citation impact were China (4.02), the Netherlands (2.99), and Germany (2.52).
② The top three countries by the proportion of cited papers were the Netherlands (70.57%), China (68.76%), and the UK (63.05%).
③ Four countries had a CNCI greater than 1 (exceeding the disciplinary average): China (1.49), the Netherlands (1.14), the UK (1.12), and the U.S. (1.09).

In 2023, Chinese authors published over 10 000 highly cited papers, significantly outperforming the second-ranked U.S. (6125 papers). The top five countries with over 1000 highly cited papers published in their domestic SCI journals were the U.S. (7444), the UK (6289), the Netherlands (2298), Germany (1309), and China (1031). The number of highly cited papers published in SCI journals from the U.S., UK, and the Netherlands exceeded the number of highly cited papers published by their domestic authors (table 2.11).

2.2.2.2 High-Impact Papers Published in Chinese SCI Journals in 2023

In 2023, among the 240 Chinese SCI journals, 141 (58.75%) published highly cited papers, while 54 (22.50%) published hot papers.

Thirteen English-language Chinese SCI journals published 20 or more highly cited papers each. Among these, the journals with the highest proportions of highly cited papers were *Molecular Plant* (28.00%), *Nano-Micro Letters* (25.11%), *Green Energy & Environment* (21.54%), and *Signal Transduction and Targeted Therapy* (20.74%). Additionally, journals with high publication volumes included *Nano Research*, *Chinese Chemical Letters*, *Journal of Materials Science & Technology*, and *Journal of Energy Chemistry* (table 2.12).

2.2.2.3 Status of Internationally Collaborative Papers in Chinese SCI Journals

1) Collaboration with the Top 14 SCI Paper-Producing Countries

In 2023, 237 of 240 Chinese SCI journals published internationally collaborative papers with major SCI paper-producing countries. In terms of the number of journals involved in

Tab. 2.11 – No. of highly cited papers published by authors and journals from the Top 15 SCI Paper-producing countries in 2023.

No.	Country	Highly-cited papers by country's authors		Journal country's highly cited papers		Ratio (*B*/*A*)
		No. of papers (*A*)	Rank	No. of papers (*B*)	Rank	
1	China	10 611	1	1031	5	0.1
2	US	6125	2	7444	1	1.22
3	UK	2557	3	6289	2	2.46
4	Germany	1997	4	1309	4	0.66
5	Australia	1761	5	87	8	0.05
6	Italy	1532	6	230	7	0.08
7	Canada	1423	7	30	11	0.02
8	India	1351	8	6	14	0
9	France	1308	9	133	6	0.1
10	Spain	1234	10	43	10	0.03
11	Netherlands	967	11	2298	3	2.38
12	Republic of Korea	923	12	81	9	0.09
13	Japan	889	13	30	12	0.03
14	Turkey	664	14	4	15	0.01
15	Brazil	410	15	29	13	0.07

Note: Retrieval method — Select "research area" in InCites dataset; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data for authors from each country and SCI journals from each country.
Arranged in descending order by the number of highly cited papers published by authors from each country.

such collaborations, 215 Chinese SCI journals published papers with the United States. Other countries with significant collaborative output, in descending order, were the UK, Australia, Germany, Canada, and Japan. In terms of citation impact, internationally collaborative papers from these countries all represent a higher share of total citations than the average for Chinese SCI-indexed journals (68.76%). Furthermore, the CNCI of these internationally collaborative papers was consistently greater than 1, indicating that the impact of internationally collaborative papers published in Chinese SCI journals generally surpassed the disciplinary average (table 2.13).

2) Comprehensive Performance of Internationally Collaborative Papers in Chinese SCI Journals

In 2023, 240 Chinese SCI journals published a total of 6616 internationally collaborative papers, with the number of such papers per journal ranging from 1 to 208. The top 10 Chinese SCI journals by the number of internationally collaborative papers are listed in table 2.14. Notably, the following journals had internationally collaborative papers representing over 50% of their total publications: *Fungal Diversity* (77.78%), *Marine Life*

Tab. 2.12 – Chinese SCI journals publishing 20 or more highly cited papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	No. of highly-cited papers	No. of papers	% of highly-cited papers
1	*Bioactive Materials*	生物活性材料 (英文)	73	426	17.14
2	*Nano-Micro Letters*	纳微快报 (英文)	59	235	25.11
3	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	56	270	20.74
4	*Journal of Energy Chemistry*	能源化学 (英文版)	49	711	6.89
5	*Nano Research*	纳米研究 (英文版)	48	1128	4.26
6	*National Science Review*	国家科学评论 (英文)	30	251	11.95
7	*Acta Pharmaceutica Sinica B*	药学学报 (英文)	29	300	9.67
8	*Green Energy & Environment*	绿色能源与环境 (英文)	28	130	21.54
9	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	28	820	3.41
10	*Molecular Plant*	分子植物 (英文)	28	100	28.00
11	*Chinese Chemical Letters*	中国化学快报 (英文版)	27	1050	2.57
12	*Light: Science & Applications*	光: 科学与应用 (英文)	24	213	11.27
13	*Plant Communications*	植物通讯 (英文)	21	121	17.36

Note: Arranged in descending order by the number of highly cited papers.

Science & Technology (74.07%), *Infectious Diseases of Poverty* (61.68%), *Propulsion and Power Research* (55.56%), and *Journal of Systematics and Evolution* (54.41%) (table 2.15).

Among the top 10 journals with the highest citation impact for internationally collaborative papers, eight journals demonstrated a higher citation impact for their internationally collaborative papers compared to their overall journal performance. A significant example is *Frontiers of Mechanical Engineering*, where the difference reached 26.94. In contrast, *Nano-Micro Letters* and *Signal Transduction and Targeted Therapy* exhibited lower citation impacts for their internationally collaborative papers compared to their overall journal performance (table 2.16).

A total of 143 Chinese SCI journals demonstrated a CNCI greater than 1 for their internationally collaborative papers, indicating that the citation performance of these papers surpassed the global average of their respective disciplines. Among the top 10 journals publishing internationally collaborative papers ranked by the CNCI, seven journals showed a higher CNCI for these collaborative papers than their overall journal performance. In contast, *Molecular Plan*, *Nano-Micro Lelters*, and *Green Energy & Environment* exhibited a lower CNCI for their intemnationally collaborative papers relative to their overall journal performance (table 2.17).

Tab. 2.13 – Status of collaborative SCI papers between China and other Top 14 SCI paper-producing countries in 2023.

No.	Country	No. of Chinese SCI journals involved in international collaboration	No. of Int'l. collaborative papers from Chinese SCI journals	Total cites of Int'l. collaborative papers from Chinese SCI journals	% of total cites contributed by int'l collaborative papers in Chinese SCI journals	CNCI of Int'l collaborative papers in Chinese SCI journals
1	US	215	1946	11 855	80.06	2.27
2	UK	180	743	4228	82.77	2.12
3	Australia	168	692	5433	84.10	2.70
4	Germany	164	661	3953	81.54	2.23
5	Canada	160	474	2757	78.48	2.08
6	Japan	154	415	2145	81.20	1.81
7	France	128	334	1536	79.64	1.91
8	Republic of Korea	125	375	2480	84.00	2.13
9	Italy	113	245	1495	80.82	2.51
10	Spain	110	236	1479	86.44	2.63
11	India	97	248	2270	86.29	3.04
12	Netherlands	78	158	838	85.44	1.86
13	Turkey	58	98	781	82.65	3.23
14	Brazil	46	74	291	93.24	1.71

Note: Retrieval method — InCites database selection of "Publication"; Time period "2023"; disciplinary classification system "Essential Science Indicators (ESI)"; document types "research papers" and "review articles"; sequential collection of data on internationally collaborative Chinese SCI journals from each country.
Arranged in descending order by the number of Chinese SCI journals participating in international collaboration.

Tab. 2.14 – Top 10 Chinese SCI journals by No. of internationally collaborative papers published in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	No. of Int'l. collaborative papers
1	*Nano Research*	纳米研究 (英文版)	English	208
2	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	English	192
3	*Journal of Energy Chemistry*	能源化学 (英文版)	English	171
4	*Bioactive Materials*	生物活性材料 (英文)	English	131
5	*Journal of Magnesium and Alloys*	镁合金学报 (英文)	English	115
6	*Chinese Chemical Letters*	中国化学快报 (英文版)	English	102
7	*National Science Review*	国家科学评论 (英文)	English	100
8	*Rare Metals*	稀有金属 (英文版)	English	95
9	*Light: Science & Applications*	光: 科学与应用 (英文)	English	91
10	*NPJ Computational Materials*	计算材料学 (英文)	English	82

Note: Arranged in descending order by the number of internationally collaborative papers.

Tab. 2.15 – Top 10 Chinese SCI journals by percentage of internationally collaborative papers to total journal publications in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	% of Int'l. collaborative papers
1	*Fungal Diversity*	真菌多样性 (英文)	English	77.78
2	*Marine Life Science & Technology*	海洋生命科学与技术 (英文)	English	74.07
3	*Infectious Diseases of Poverty*	贫困所致传染病 (英文)	English	61.68
4	*Propulsion and Power Research*	推进与动力 (英文)	English	55.56
5	*Journal of Systematics and Evolution*	植物分类学报	English	54.41
6	*Geoscience Frontiers*	地学前缘 (英文版)	English	47.69
7	*Environmental Science and Ecotechnology*	环境科学与生态技术 (英文)	English	47.50
8	*Journal of Ocean Engineering and Science*	海洋工程与科学 (英文)	English	44.00
9	*Pedosphere*	土壤圈 (英文)	English	44.00
10	*Journal of Sport and Health Science*	运动与健康科学 (英文)	English	43.94

Note: Arranged in descending order by the proportion of internationally collaborative papers.

TAB. 2.16 – Top 10 Chinese SCI journals by citation impact of internationally collaborative papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	Citation impact of Int'l. collaborative papers	Citation impact
1	*Frontiers of Mechanical Engineering*	高等学校学术文摘·机械工程前沿 (英文)	English	33.13	6.19
2	*Electrochemical Energy Reviews*	电化学能源评论 (英文)	English	24.67	22.56
3	*Nano-Micro Letters*	纳微快报 (英文)	English	23.43	24.59
4	*Green Energy & Environment*	绿色能源与环境 (英文)	English	21.46	17.07
5	*Bioactive Materials*	生物活性材料 (英文)	English	20.09	18.37
6	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	English	17.05	18.85
7	*Acta Physico-Chimica Sinica*	物理化学学报	Chinese	14.36	10.97
8	*Opto-Electronic Advances*	光电进展 (英文)	English	12.50	10.90
9	*Military Medical Research*	军事医学研究 (英文)	English	12.21	9.45
10	*Chinese Journal of Catalysis*	催化学报	English	12.11	9.09

Note: Arranged in descending order by the citation impact of internationally collaborative papers.

TAB. 2.17 – Top 10 Chinese SCI journals by Category Normalized Citation Impact (CNCI) publishing internationally collaborative papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	Citation impact of Int'l. collaborative papers	CNCI
1	*Frontiers of Mechanical Engineering*	高等学校学术文摘·机械工程前沿 (英文)	English	10.92	2.03
2	*Fungal Diversity*	真菌多样性 (英文)	English	7.72	6.65
3	*Molecular Plant*	分子植物 (英文)	English	7.50	8.03
4	*Nano-Micro Letters*	纳微快报 (英文)	English	5.64	5.87
5	*Opto-Electronic Advances*	光电进展 (英文)	English	5.55	4.99
6	*International Journal of Mining Science and Technology*	矿业科学技术学报 (英文)	English	5.52	4.29

Tab. 2.17 – (continued).

No.	Journal title (ENG)	Journal title (CHN)	Language	Citation impact of Int'l. collaborative papers	CNCI
7	*Bioactive Materials*	生物活性材料 (英文)	English	5.11	4.82
8	*Green Energy & Environment*	绿色能源与环境 (英文)	English	5.10	5.44
9	*Military Medical Research*	军事医学研究 (英文)	English	5.01	4.20
10	*Acta Physico-Chimica Sinica*	物理化学学报	Chinese	4.98	3.34

Note: Arranged in descending order by the Category Normalized Citation Impact (CNCI) of internationally collaborative papers.

2.2.2.4 Publication Status of Chinese SCI Journals in 2023

In 2023, 240 Chinese SCI journals collectively published 37 824 papers, with the number of articles per journal ranging from 18 to 1128. The top 10 Chinese SCI journals in terms of publication volume, total cites, citation impact, and CNCI are presented in tables 2.18–2.21.

Tab. 2.18 – Top 10 Chinese SCI journals by number of published papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	No. of papers
1	*Nano Research*	纳米研究 (英文版)	English	1128
2	*Chinese Chemical Letters*	中国化学快报 (英文版)	English	1050
3	*Chinese Physics B*	中国物理B (英文)	English	1050
4	*Acta Physica Sinica*	物理学报	Chinese	834
5	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	English	820
6	*Journal of Energy Chemistry*	能源化学 (英文版)	English	711
7	*Spectroscopy and Spectral Analysis*	光谱学与光谱分析	Chinese	556
8	*Rare Metal Materials and Engineering*	稀有金属材料与工程	Chinese	474
9	*Bioactive Materials*	生物活性材料 (英文)	English	426
10	*Rare Metals*	稀有金属 (英文版)	English	413

Note: Arranged in descending order by the number of papers; journals with the same number of papers are listed alphabetically.

TAB. 2.19 – Top 10 Chinese SCI journals by total cites of published papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	Total cites
1	*Bioactive Materials*	生物活性材料 (英文)	English	7827
2	*Journal of Energy Chemistry*	能源化学 (英文版)	English	6916
3	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	English	6851
4	*Chinese Chemical Letters*	中国化学快报 (英文版)	English	6709
5	*Nano Research*	纳米研究 (英文版)	English	6520
6	*Nano-Micro Letters*	纳微快报 (英文)	English	5778
7	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	English	5090
8	*Journal of Magnesium and Alloys*	镁合金学报 (英文)	English	2812
9	*National Science Review*	国家科学评论 (英文)	English	2531
10	*Green Energy & Environment*	绿色能源与环境 (英文)	English	2219

Note: Arranged in descending order by total citation frequency.

TAB. 2.20 – Top 10 Chinese SCI journals by citation impact of published papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	Citation impact
1	*Nano-Micro Letters*	纳微快报 (英文)	English	24.59
2	*Electrochemical Energy Reviews*	电化学能源评论 (英文)	English	22.56
3	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	English	18.85
4	*Bioactive Materials*	生物活性材料 (英文)	English	18.37
5	*Green Energy & Environment*	绿色能源与环境 (英文)	English	17.07
6	*Molecular Plant*	分子植物 (英文)	English	12.14
7	*Carbon Energy*	碳能源 (英文)	English	11.38
8	*Advanced Fiber Materials*	先进纤维材料 (英文)	English	11.10
9	*Acta Physico-Chimica Sinica*	物理化学学报	Chinese	10.97
10	*Opto-Electronic Advances*	光电进展 (英文)	English	10.90

Note: Arranged in descending order by citation impact.

TAB. 2.21 – Top 10 Chinese SCI journals by CNCI of published papers in 2023.

No.	Journal title (ENG)	Journal title (CHN)	Language	CNCI
1	*Molecular Plant*	分子植物 (英文)	English	8.03
2	*Fungal Diversity*	真菌多样性 (英文)	English	6.65
3	*Nano-Micro Letters*	纳微快报 (英文)	English	5.87
4	*Green Energy & Environment*	绿色能源与环境 (英文)	English	5.44
5	*Opto-Electronic Advances*	光电进展 (英文)	English	4.99
6	*Bioactive Materials*	生物活性材料 (英文)	English	4.82
7	*Plant Communications*	植物通讯 (英文)	English	4.34
8	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	English	4.31
9	*Light: Science & Applications*	光: 科学与应用 (英文)	English	4.30
10	*International Journal of Mining Science and Technology*	矿业科学技术学报 (英文)	English	4.29

Note: Arranged in descending order by CNCI.

Reference

[1] 肖宏, 赵岩. 刊网融合助力学术期刊传播: 以中国知网为例[J]. 中国科技期刊研究, 2023, 34(5): 593-600.

Chapter 3

Open Publishing in Chinese Scientific Journals

Yanhong HUANG, Xiaomin LIU, Tao ZHANG and Na MA

Abstract

Chinese researchers have actively joined the global open science movement, and Chinese scientific journals in the Chinese language have likewise made substantial progress in exploring open publishing. Progress has been made in open publishing models, copyright management mechanisms, and scientific data publishing, leading to a deepened understanding and practical experimentation. Under the broader open science agenda, national authorities, government agencies, research funding organizations, and international bodies have promoted open publishing by updating open-access policies and building open-access infrastructure. International publishers have expanded open publishing through the launch of OA journals, support for OA transition, and the formulation of open science practice policies, while also collaborating with funding agencies and academic institutions worldwide to facilitate OA transformation. Both international and domestic open publishing platforms have diversified and expanded in scale, increasingly shaping scholarly communication. As Chinese scientific journals face the transformation toward open access, the sector requires a more comprehensive policy and regulatory framework, effective utilization of open publishing platforms, and coordinated mechanisms to support sustainable open publishing development.

3.1 Current Status of Open Publishing in Chinese Scientific Journals

3.1.1 Active Participation of Chinese Researchers in the Global Open Science Movement

Over the past three years, nearly 50% of global scientific papers authored by Chinese researchers were published as OA, demonstrating China's active engagement in the open

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publishing movement. Chinese scholars published more than 4.7 million papers[1] between 2013 and 2023, including over 1.84 million OA papers, representing 39.23% of the total output. In 2023 alone, more than 290 000 OA papers were published, accounting for 43.24% of all publications. The OA share has shown a clear upward trend over the decade, peaking in 2022 (46.41%) before slightly declining in 2023, returning to a level similar to that of 2021 (figure 3.1).

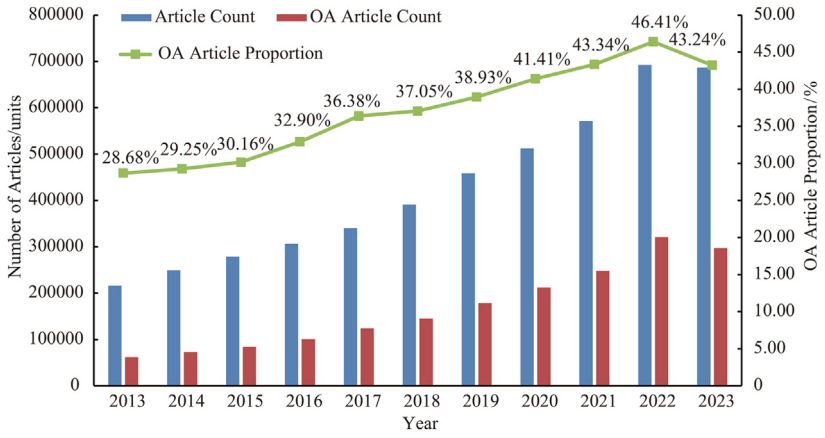


Fig. 3.1 – Number and proportion of OA articles from China, 2013–2023.

Scientific data—an increasingly important strategic resource—has also drawn growing attention from the global research community. Chinese scholars' engagement in data paper publishing is still in an early stage. From 2013 to 2023, 5491 scientific data papers were published globally, of which Chinese researchers authored 1218 papers (22.18%), slightly lower than China's overall share of global scientific publications[2] (25.27%). The number of data papers authored by Chinese scholars increased steadily each year, and China's share of global data papers rose correspondingly. In 2023, Chinese researchers published 348 scientific data papers, accounting for 30.21% of the global output (figure 3.2). These trends indicate a growing awareness and practice of scientific data sharing and publishing among Chinese researchers.

3.1.2 Analysis of Open Publishing Models in Chinese Scientific Journals

As the open science movement accelerates, an increasing number of scientific journals have adopted open publishing approaches. Journals that initially experimented with the bronze

[1]The SCIE and SSCI databases within the WoS Core Collection were used as the data source. Only articles of the document type "Article" were included. OA papers were identified based on the database's designated labels.

[2]Papers indexed in the SCIE and SSCI databases within the WoS Core Collection, with the document type restricted to "Article".

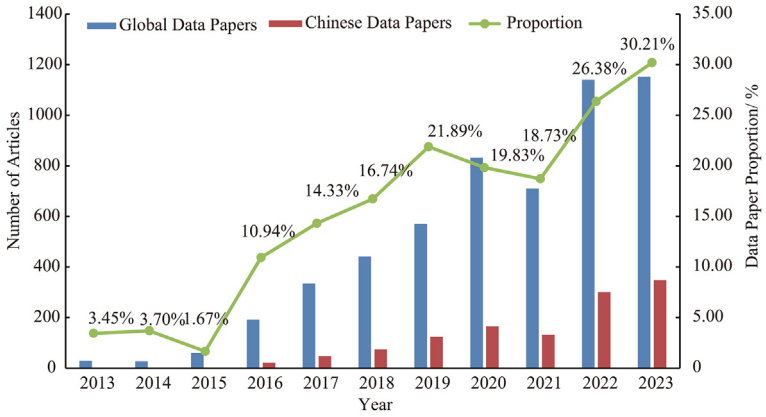


FIG. 3.2 – Number and proportion of Chinese data papers, 2013–2023.

OA model have begun transitioning toward gold OA in accordance with Creative Commons licensing standards. Based on data from the Chinese Science Citation Database (CSCD), this section provides an objective overview of open publishing in Chinese scientific journals, including the scale of OA journals, publishing models, and disciplinary characteristics.

CSCD-indexed journals place a relatively high emphasis on OA publishing practices. A total of 1163 CSCD-indexed journals engage in open publishing to varying degrees, representing 86.73% of all 1341 source journals. Among them are 314 English-language journals (99.05% OA) and 849 Chinese-language journals (82.91% OA). OA adoption is notably higher among English-language journals. This section focuses on the 849 Chinese-language OA journals.

Chinese scientific journals mainly adopt two OA publishing models: gold OA and bronze OA. Bronze OA is currently the dominant model among Chinese scientific journals, wherein full-text free access is provided by the editorial office after publication. A total of 672 journals adopt this model, representing 79.15% of all Chinese OA journals. In comparison, gold OA accounts for 177 journals, or 20.85% of the total.

OA publishing practices vary across disciplines. The number, proportion, and applied publishing models of OA journals differ by discipline (table 3.1). In all disciplines, the proportion of OA journals exceeds 72%. Among them, "Mathematics, Physics, and Chemistry" has the highest proportion of OA journals, reaching 92.06%, while "Transportation" shows the lowest proportion at 72.00%. A total of six disciplines have proportions higher than the average value of 82.91%, namely "Mathematics, Physics, and Chemistry", "Biological Sciences", "Agricultural Sciences", "Environmental Science and Safety Science", "Astronomy and Earth Sciences", and "Comprehensive Journals". Five disciplines have proportions lower than the average value, namely "Social Sciences", "Industrial Technology", "Medicine and Health", "Aeronautics and Astronautics", and "Transportation". In each discipline, more than half of the OA journals have adopted the bronze OA model.

Tab. 3.1 – OA publishing models of Chinese journals in the 2024 CSCD database by discipline.

Discipline	Number of journals	OA Journals			
		Gold OA	Bronze OA	Total	Proportion/%
Mathematics, Physics, and Chemistry	63	6	52	58	92.06
Biological Sciences	45	5	34	39	86.67
Agricultural Sciences	102	21	71	92	90.20
Environmental Science, Safety Science	28	5	20	25	89.29
Astronomy, Earth Sciences	103	29	61	90	87.38
Multidisciplinary Journals	61	6	46	52	85.25
Social Sciences	19	2	13	15	78.95
Industrial Technology	299	65	178	243	81.27
Medicine, Health	248	27	167	194	78.23
Aeronautics, Astronautics	31	7	16	23	74.19
Transportation	25	4	14	18	72.00
Total	1024	177	672	849	82.91

Note: Sorted in descending order by the proportion of OA journals.

Under the mainstream bronze OA publishing model of Chinese scientific journals, 169 journals have adopted the international Creative Commons 4.0 licensing agreement, accounting for 19.91% of all OA journals. This represents a significant increase compared with 2023 (5.29%), indicating a progressive strengthening of copyright governance awareness among Chinese journals. The remaining 680 OA journals require authors to sign copyright transfer agreements, through which rights of compilation (partial or full), translation, reproduction of printed and electronic versions, distribution, and dissemination *via* online platforms are transferred to the editorial office.

CC BY and CC BY-NC-ND are the two most adopted Creative Commons licenses among Chinese scientific journals. CC BY permits users to reproduce, distribute, exhibit, perform, screen, broadcast, or disseminate the work through information networks, including for commercial purposes, provided that proper attribution to the original author is retained. CC BY-NC-ND allows users to reproduce, distribute, exhibit, perform, project, broadcast, or communicate the articles published in the journal in question to the public *via* information networks for non-commercial purposes. However, the author's attribution must be retained, use for commercial purposes is prohibited, and derivative works may not be created. Most journals offer a variety of Creative Commons licenses (CC licenses) for authors to choose from. Only a few journals adopt the CC BY-SA, CC BY-ND, and CC BY-NC-SA licenses (table 3.2).

Unlike international OA journals that charge APCs, Chinese OA journals, whether gold OA or bronze OA, still primarily operate under the model of either charging page fees or being free of charge. Although some journals explicitly charge fees under the name of APCs, the calculation standards and specific coverage of these charges remain unclear. Based on publicly available per-article prices, APCs in China are generally comparable to traditional page fees. For example, *Journal of Radars* charges an APC of 300 RMB per page, while *Journal of Mining Science and Technology* charges a publishing fee of 1200 RMB per article.

TAB. 3.2 – Licensing agreements followed by Chinese OA journals.

License	Journal type	Number of journals	Key element abbreviations and meanings
CC BY	Chinese	22	BY: Attribution
CC BY-SA	Chinese	0	BY: Attribution, SA: ShareAlike
CC BY-ND	Chinese	1	BY: Attribution, ND: NoDerivatives
CC BY-NC	Chinese	17	BY: Attribution, NC: NonCommercial
CC BY-NC-SA	Chinese	0	BY: Attribution, NC: NonCommercial, SA: ShareAlike
CC BY-NC-ND	Chinese	114	BY: Attribution, NC: NonCommercial, ND: NoDerivatives
Publisher's Own License	Chinese	680	Copyright transfer agreements customized by the editorial office

To gain a more comprehensive understanding of the service capacities of self-built platforms under the OA publishing model of scientific journals in the Chinese language, statistical data from the *Directory of Chinese Open Access Scientific Journals* were used to analyze 1380 Chinese journals in terms of full-text browsing, download availability, DOI registration, and publication ethics policies.

Most Chinese OA journals included in the Directory support online browsing and full-text access on their self-built platforms. Among the 1380 journals analyzed, 834 journals (60.43%) enable full-text online browsing, accounting for more than half of the total. Furthermore, 99% of journals (1367 in total) support full-text download, and only 13 journals do not provide direct online access to full text.

Chinese scientific journals demonstrate insufficient emphasis on CC licensing. Only 228 journals have posted statements on their websites indicating they follow CC licenses, accounting for merely 16.52%. This proportion is generally consistent with the CSCD survey results (19.91%), indicating that awareness of international Creative Commons licensing among Chinese journals still needs improvement.

The DOI serves as a unique identifier for digital objects, facilitating the long-term preservation, reliable citation, and identity recognition of digital resources, and plays an important role within the OA publishing model. Over the past decade, journals have paid considerable attention to DOI registration. Nevertheless, due to various factors, the complete registration of DOIs for all articles published under the OA model since its adoption remains less than satisfactory. Among the 1380 Chinese journals surveyed, 394 journals have relatively complete DOI registration, 842 journals[3] have carried out partial registration, and 144 journals have not yet performed DOI registration, accounting for

[3]For each journal included in the survey, the DOI registration status was assessed by examining three specific articles: ① the first article of the first issue published in 2023, ② the first article of the last issue published in 2023, and ③ the first article of the earliest open-access issue. Journals were then categorized as follows: "Journals with registered DOIs" if all three articles had a DOI, "Journals without registered DOIs" if none of the three articles had a DOI, and "Journals with partially registered DOIs" if at least one but not all three articles had a DOI.

28.55%, 61.01%, and 10.43% of the total journals, respectively. Overall, approximately 90% of journals demonstrate awareness of DOI registration and possess the capacity for DOI implementation.

Regarding publication ethics policies, journals generally demonstrate insufficient emphasis in this area. Only 576 journals explicitly provide ethical policy statements, accounting for 41.74%, which is less than half. In comparison, 68% of English-language journals have publication ethics policies, significantly more than those of Chinese-language journals.

3.1.3 Status of Data Submission Associated with Articles Published in Chinese Scientific Journals

In 2022, CAST and the General Office of CAS jointly issued the Implementation Plan for the Submission of Data Associated with Scientific Journal Articles, initiating the work of collecting article-related data from journals. Through the "Innovation China" Scientific Data Repository and Service Platform, online submission, data review, and open-sharing services for article-associated datasets are provided. The platform is built upon ScienceDB —a scientific data repository jointly supported and guided by CAS and CAST—and shares unified user registration and data access permissions. As of August 2024, the CAST Scientific Data Repository and Service Platform had stored 1505 datasets and 309 288 data files, with a total data volume reaching 86 TB and cumulative visits exceeding 6.5 million.

Chinese scientific journals still need to strengthen research and formulation of policies regarding the sharing of data associated with published articles. A survey of article-related data-sharing policies among 1024 Chinese journals indexed in the CSCD, based on policy descriptions provided on journal websites and existing research[1], categorizes them into four types: "Encouraged", "Strongly Recommended", "Mandatory/Specific Requirements", and "No Data Policy". The overall rate of policy adoption remains low, with only 90 journals clearly specifying their requirements concerning data sharing, accounting for 8.79%. Among them, 64 journals encourage data sharing, 16 strongly recommend open and shared data, and 10 impose mandatory or specific requirements regarding data deposition, while 934 journals do not provide any data-sharing policy statements (table 3.3). Among the 90 journals that have issued data-sharing statements, 57 titles (63.33%) are supervised by CAS, 8 (8.89%) by CAST, and 4 (4.44%) by the Ministry of Education, with the remaining journals distributed among departments and ministries, provincial research institutions, universities, enterprises, and other organizations.

Tab. 3.3 – Research data sharing models in CSCD Chinese source journals.

Chinese journal count	Research data sharing model				Percentage of journals with data policies/%
	Encouraged (No. of journals)	Strongly recommended (No. of journals)	Mandatory/Specific requirement (No. of journals)	No data policy (No. of journals)	
1024	64	16	10	934	8.79

In addition to the storage and sharing of article-associated datasets, data papers have explored new approaches to open scientific data from a publishing perspective. Currently, few journals that have been approved to obtain a China Standard Serial Number (CN) publish data papers. Presently, *China Scientific Data* (Chinese and English Online Edition) and *Journal of Global Change Data & Discovery* (Chinese and English) focus specifically on publishing scientific data papers, while *Big Earth Data* and *Journal of Agricultural Big Data* treat data papers as a key component of their publications. With the continuous advancement of scientific data sharing, several academic journals have also established dedicated sections for data papers, such as *Biodiversity Science*, *Journal of Plant Ecology*, and *Journal of Image and Graphics*. This indicates that the publication of data papers has preliminarily expanded across various disciplines.

3.2 Current Status of Open Publishing Platform Development in China

3.2.1 Overview of China's Open Publishing Platforms

Based on their functional positioning, China's open access academic exchange and publishing platforms can be categorized into the following types: OA journal aggregation platforms, institutional repositories, open resource integration platforms, open publishing and dissemination platforms, preprint platforms, and scientific data repositories.

3.2.1.1 OA Journal Aggregation Platforms

The primary OA journal aggregation platforms in China include the National Science and Technology Journal Platform and the China Open Access Journals (COAJ) database, as detailed in table 3.4.

China's Science and Technology Journal Platform (opaj.napstic.cn/) was established in 2022 by the Institute of Scientific and Technical Information of China (ISTIC). It provides a professional dissemination platform for high-quality OA journals in China, promoting the public-interest use and open sharing of academic resources. Most of the journals indexed on the platform are Chinese-language journals, with cooperation established by signing the *National Science and Technology Journal Works Open Access and China First Release Agreement* with legitimate, science and technology-oriented domestic journals.

COAJ (www.coaj.cn/) was initiated by Science Press in 2010 and underwent a comprehensive upgrade in 2024. The platform's submission guidelines clearly outline its inclusion criteria, which primarily focus on OA journals published in China, with the aim of disseminating high-quality academic resources under an open-sharing model. Joining COAJ helps journals refine their OA publishing policies, implement various publishing systems, and align with international OA publishing standards. Up to November 2024, the platform has indexed 34 Chinese-language journals and 7 Chinese-English bilingual journals.

Tab. 3.4 – Case studies of OA journal aggregation platforms in China.

Name	Coverage scope	Inclusion criteria	Inclusion mechanism	Data submission	Data volume
National Science and Technology Journal Platform	China	Journal qualification Collaboration content Copyright usage license License fees and payment Responsibilities and obligations Agreement duration and termination Dispute resolution Other	Bilateral agreement signing	Complete data from the journal's inception, including metadata and full texts	1379 journals 10.53 million articles
COAJ	Global	Formal journal requirements Editorial board Journal policies Publication ethics statement Open access statement Copyright policy Open access Journal website Publication timeline	Active selection Journal application	Self-submission of metadata or full texts	243 journals 31 000 articles

Note: Data statistics are current as of August 2024.

3.2.1.2 Institutional Repositories

As of August 2024, OpenDOAR includes 65 institutional repositories from China, accounting for 1.07%[4] of the total. China primarily features two major institutional repository alliances: the CAS Institutional Repository Grid (CAS IR GRID), which covers 114 institutional repositories, and the China Academic Institutional Repository Alliance (CHAIR), comprising repositories from 21 member institutions. The National Natural Science Foundation Basic Research Knowledge Base (NSFC-OR) stores research outputs funded by the National Natural Science Foundation of China. The National Knowledge Repository, developed by ISTIC, primarily stores knowledge outputs generated from various levels of public funding in China (see table 3.5).

Tab. 3.5 – Representative cases of institutional repositories in China.

Name	URL	Year launched	Coverage scope	Data volume (in 10 000 entries)
CAS IR GRID	www.irgrid.ac.cn	2009	CAS	>142.00
CHAIR	chair.calis.edu.cn	2016	Chinese Universities	286.84
NSFC-OR	kd.nsfc.cn	2015	Projects funded by NSFC	112.14
National Knowledge Repository	pubnr.napstic.cn	2022	Publicly Funded Projects	>101.00

Note: Data statistics are current as of August 2024.

3.2.1.3 Open Resource Integration Platforms

The main open resource integration platforms include the PubScholar Public Service Academic Platform, the GoOA Platform, and the China Open Research Knowledge Cloud (CORC), all developed by the National Science Library of the CAS (NSLC), as well as Socolar, operated by China Educational Publications Import & Export Corporation Ltd. CORC aggregates knowledge repositories from multiple research and educational institutions, while the other three platforms primarily focus on gathering global OA academic resources (see table 3.6).

3.2.1.4 Open Publishing and Dissemination Platforms

1) Platforms Supported by the Action Plan for Excellence in Chinese Scientific Journals

Supported by the Action Plan for Excellence in Chinese Scientific Journals, five cluster pilot projects and one international digital publishing service platform sub-project have progressively launched or upgraded their journal publishing and dissemination platforms, contributing to the development of open publishing platforms in China. These platforms include SciEngine by Science Press, Researching by the Chinese Laser Press, Frontiers

[4] v2.sherpa.ac.uk/view/repository_by_country/, accessed on August 23, 2024.

Tab. 3.6 – Representative cases of open resource integration platforms in China.

Name	URL	Year launched	Resource type	Data volume
PubScholar	pubscholar.cn/	2023	Non-profit Academic Resources	180 million metadata entries 23.38 million freely accessible articles
GoOA	gooa.las.ac.cn/	2013	OA Journals	27 583 journals 16.55 million articles
Socolar	www.socolar.com/	2006	Academic Journals	29 645 journals 11 430 OA journals 410 000 OA articles
CORC	www.corc.org.cn	2017	Institutional Repository Resources	284 repositories 6.46 million documents

Note: Data statistics are current as of August 2024.

Journal by Higher Education Press, Youke Youshu and Web of Tech by Youke Publishing, MedNexus by the Chinese Medical Association Publishing House, and SciOpen by Tsinghua University Press (see table 3.7).

2) Regional Journal Cluster Platforms

Key regional journal cluster platforms include the "YuPublish" Journal Cluster Platform and the Chutian Science and Technology Journal Online Open Platform, both of which aim to promote the high-quality development of journals by integrating the strengths and resources of regional publications.

The Chongqing University Journals Association initiated the development of the "YuPublish" Journal Cluster Platform (www.yuchuban.com/) in 2020. Initially, it established four vertical clusters covering fields such as humanities and social sciences, medicine, and health. As of August 2024, the platform hosts 33 journals, including 28 Chinese-language journals.

In 2021, the Hubei Association for Science and Technology, in collaboration with five other institutions, launched the "Hubei Science and Technology Journals Chutian Excellence Action Plan", which proposed the construction of the Chutian Science and Technology Journal Online Open Platform (journal.hustp.com/). By August 2024, the platform has aggregated 103 journals, with 92 of them in Chinese-language.

3.2.1.5 Preprint Platforms

The main preprint publishing platforms in China include the "First Release Papers" section of China Sciencepaper Online, hosted by the Ministry of Education's Science and Technology Development Center; the CAS Scientific Paper Preprint Platform (ChinaXiv), operated by NSLC; the Biomedical Science Paper Preprint System (biomedRxiv), managed by the Institute of Medical Information at the Chinese Academy of Medical Sciences; and the National Preprint Platform, established by ISTIC (see table 3.8).

Tab. 3.7 – Open publishing platforms supported by the Action Plan for Excellence in Chinese Scientific Journals.

Name	URL	Year launched	Total journals (A)	Chinese journals (B)	Proportion of Chinese journals ($B/A \times 100\%$)	OA journals (C)	Chinese OA journals (D)	Proportion of Chinese OA journals ($D/C \times 100\%$)
SciEngine	www.sciengine.com	2016	537	221	41.15	291	65	22.34
YouKe YouShu	www.ukus.com.cn	2024	230	118	51.30	87	45	51.72
Web of Tech	www.weboftech.com	2024	166	55	33.13	63	21	33.33
SciOpen	www.sciopen.com	2022	112	7	6.25	100	3	3.00
Researching	www.researching.cn	2021	82	54	65.85	79	54	68.35
Frontiers Journal	journal.hep.com.cn	2006	53	2	3.77	13	0	0.00
MedNexus	mednexus.org	2021	24	0	0.00	24	0	0.00

Note: Data statistics are current as of September 2024.
Platforms are listed in descending order by total number of journals.

Tab. 3.8 – Representative cases of preprint platforms in China.

Name	URL	Year launched	Data volume (articles)	Coverage scope
China Sciencepaper Online	www.paper.edu.cn/releasepaper/	2003	110 000	Multidisciplinary
ChinaXiv	chinaxiv.org/home	2016	40 000	Multidisciplinary
biomedRxiv	www.biomedrxiv.org.cn	2020	936	Biomedical
National Preprint Platform	sinoxiv.napstic.cn	2022	162	Multidisciplinary

Note: Data statistics are current as of September 2024.

3.2.1.6 Scientific Data Repository Platforms

A total of 83 Chinese data repository platforms are registered in Re3data, accounting for 2.6%[5] of the total. Notable general-purpose data repository platforms in China include ScienceDB and the Peking University Open Data Research Platform. ScienceDB (www.scidb.cn), developed by the Computer Network Information Center of CAS, is recognized by publishers such as Springer Nature and Elsevier. It is integrated with submission systems from SciEngine, Founder, and Renhe, providing paper-associated data storage and publication services for 2500 journals worldwide. As of August 2024, the platform hosts 10.32 million datasets and is associated with approximately 11 000 research papers.

3.2.2 Development Trends of Open Publishing Platforms in China

3.2.2.1 Policies Driving the Sustained Development of Open Publishing Platforms

In May 2004, CAS and NSFC signed the Berlin Declaration[2], marking the beginning of OA policy formulation in China. In May 2014, the *Policy Statement of the CAS on Open Access to Publications from Publicly Funded Research Projects* and the *Policy Statement of the National Natural Science Foundation of China on Open Access to Research Papers from Funded Projects* were issued. Both policies endorse green OA, requiring that publicly funded research papers be deposited in their respective institutional repositories. China's OA policies have evolved to become more targeted and actionable, facilitating the establishment of institutional repositories such as CAS IR GRID and NSFC-OR, which have played an active role in promoting the dissemination and exchange of OA academic resources.

In March 2018, the General Office of the State Council issued the *Measures for the Management of Scientific Data*, which mandates that scientific data funded by government budget funds should be "deposited in relevant scientific data centers" and calls for "advancing the construction and development of national scientific data centers". In 2019, the Ministry of Science and Technology and the Ministry of Finance jointly announced the

[5] www.re3data.org/browse/by-country/, accessed on August 27, 2024.

establishment of 20 National Scientific Data Centers[3], which serve as critical platforms for implementing data management and open sharing. In 2021, CAS established the CAS scientific data center system comprising "one general center, 18 discipline-specific centers, and 13 institutional-level centers"[4]. This system has significantly enhanced the open sharing, dissemination, and utilization of scientific data across multiple disciplines in China. The repository ScienceDB, developed by the general center, has obtained certification from multiple publishers, offering researchers a self-controlled solution for depositing paper-associated data into publisher-designated repositories while also aggregating scientific data resources from various countries and regions worldwide.

In August 2019, four government departments jointly issued the *Guidelines on Deepening Reform and Cultivating World-Class Scientific Journals*. In September of the same year, seven departments, including CAST, jointly launched the Action Plan for Excellence in Chinese Scientific Journals, which remains the most substantial and wide-ranging major support initiative in the field of scientific journals in China. With the backing of this plan, the number of top-tier journals in various disciplines across China has multiplied. Journals ranked among the top three in their disciplines increased from 9 to 43, while those ranked within the top 5% grew from 8 to 55, fostering the development of a group of high-level OA journals. Several cluster-based platforms and digital publishing service platforms have been launched, achieving clustered management of journal publishing, and construction of international dissemination, and knowledge services. Initial progress has also been made in independently managed journals and the repatriation of overseas English-language journals. These efforts have laid a platform foundation for building a national digital publishing infrastructure and fostering an open publishing ecosystem.

The Proposal of the Central Committee of the Communist Party of China on Formulating the 14th Five-Year Plan for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 identifies "building a high-level exchange platform for national scientific research papers and technological information" as one of the key measures to "strengthen national strategic scientific and technological capabilities", setting a strategic goal for the development of academic journals and academic exchange platforms in China in the new development stage. The *Opinions on Promoting the Prosperity and Development of Academic Journals* highlights that "strengthening the development of academic journals plays a significant role in enhancing the nation's technological competitiveness and cultural soft power, as well as in shaping the Chinese spirit, values, and strength". It encourages "advancing digital transformation" and "promoting the construction of integrated development platforms", while also proposing a series of specific measures for building digital knowledge service publishing platforms for journals. The frequent introduction of such policies has charted a clear direction for the development of open publishing in China, consistently driving forward the advancement of open science.

3.2.2.2 The Breadth and Depth of Open Publishing Platform Development Remain Insufficient

In recent years, China has seen a diversification of open publishing platform types, with active participation from stakeholders such as research and educational institutions, funding bodies, and publishing organizations. The number of platforms continues to rise, and the growing availability of OA resources reflects the increasing acceptance and

emphasis placed on open publishing across various sectors in China, aligning with global open science initiatives. Sharing research outputs and scientific data not only provides researchers with broader access to knowledge and lower costs of accessing research results but also offers the public more convenient pathways to engage with scientific achievements, thereby further promoting the dissemination and innovation of knowledge.

Currently, open publishing platforms in China predominantly focus on single-form publishing practices. Greater collaboration and integration among journal publishers and other relevant stakeholders in open science practices are needed. The advancement and application of information technology can support data interconnectivity and workflow alignment across platforms. By integrating diverse publishing formats and leveraging the strengths of each platform, academic exchange can be further enriched, helping academic journals achieve high-quality digital and international development. There is an urgent need for mechanisms to connect these isolated information systems, enabling cross-regional, cross-institutional, and cross-platform one-stop open access practices. This would facilitate integrated search functionalities, unified metadata standards, consolidated open access to content, and the development of additional knowledge services such as repositories and data mining. Such integration would create a competitive advantage for China's open publishing platforms on a global scale.

Open science advocates for global knowledge sharing, and the development of open publishing platforms is a crucial pathway to achieving this goal. As open science gains broader consensus, institutional repositories, OA journal platforms, preprint platforms, and scientific data repositories—key components of China's open science infrastructure—will continue to mature. However, due to differences in policy formulation, support, and implementation across platforms, significant disparities remain in their development levels and progress. While journal digital publishing and cluster platforms, as well as open data platforms supported by national policies, have grown rapidly, OA initiatives backed by institutional policies often face challenges due to the lack of mandates. There is still room for improvement in enhancing deposit efficiency, increasing openness, and expanding the integration and utilization of resources. Other open publishing platforms, such as preprint platforms without policy guidance, remain in a phase of independent exploration and urgently require macro-level strategic planning to strengthen their development.

3.3 Issues and Challenges in Open Publishing for Chinese Scientific Journals

3.3.1 Policy Framework for Open Publishing Requires Further Improvement

The development of OA relies on the efforts of multiple stakeholders and requires institutional safeguards such as national laws, regulations, and policies. Developed countries in Europe and North America began their OA practices early and have continuously refined relevant policies to ensure public access to publicly funded academic achievements. For example, the UK Research and Innovation (UKRI) mandates that funded researchers must

make their published academic papers immediately OA under the CC BY license or other licenses permitted by UKRI. Similarly, the U.S. Office of Science and Technology Policy (OSTP) requires public access to be provided immediately upon publication. Major international research funding agencies have incorporated OA as a critical component into their management systems and have issued corresponding policies to facilitate data storage and content sharing, ensuring the effective implementation of OA. According to Sherpa/Juliet, over 65% of the funding agencies it tracks have mandatory open access policies, approximately 22% have encouraging policies, and only a small portion (around 13%) have no relevant policies[6].

In line with the goals and original intent of OA, it is inevitable that Chinese scientific journals will better and more widely serve scholars by making Chinese research outcomes accessible without barriers. In 2014, NSFC and CAS issued OA policies, encouraging scholars to deposit their papers into institutional repositories after the embargo period ends. However, these policies did not set specific development goals for OA journals from the perspective of journal publishing. Addressing the urgent need for China's open science policies requires multi-ministerial collaboration that considers the current management models of journals, the operational characteristics of journal publishing, and factors such as the advancement of credible research by journals. Formulating such policies to guide journal publishing remains a critical challenge to be resolved.

3.3.2 Initial Infrastructure for OA in Chinese Scientific Journals has Taken Shape

In recent years, China has made notable progress in developing OA dissemination platforms for Chinese-language journals. The steady launch of platforms such as the National Science and Technology Journal Platform and COAJ, which provide free full-text access to academic journals, reflects the national emphasis on and promotion of OA for Chinese journals. Compared to publishing platforms operated by international publishers, China's self-developed platforms are better positioned to deeply understand the developmental needs of Chinese journals and provide localized services, demonstrating strong potential to advance open publishing for Chinese journals. The continuous upgrading and optimization of these independent digital publishing platforms not only facilitate the participation of other academic platforms in the publishing chain but also strengthen the construction of an open publishing ecosystem. For instance, the SciEngine platform has collaborated with services such as CSTR, ChinaXiv, and ScienceDB to enhance and integrate relevant capabilities, enabling seamless data and service interoperability across platforms. This interaction between traditional journal publishing and open academic communication models supports a smoother transition toward open publishing for journals.

However, the scope and depth of OA infrastructure are extensive, requiring robust policy support and national-level implementation planning. China's OA infrastructure system remains incomplete. To achieve optimized resource allocation and efficient utilization, open publishing platforms across relevant domains in China must enhance

[6]Originally sourced from Sherpa/Juliet (beta.sherpa.ac.uk), which has since been updated and migrated to Jisc's Open Library Finder. https://openpolicyfinder.jisc.ac.uk.

cross-platform sharing of resources and data, avoid information silos and redundant development, and foster a more inclusive and collaborative open publishing environment. This will help optimize the layout and development model of OA infrastructure.

3.3.3 Development of Open Publishing Mechanisms for Chinese Scientific Journals

3.3.3.1 Advancing the Improvement of Copyright Policies

Chinese OA journals are characterized by a dominance of bronze OA, which typically involves incomplete OA policies and offers free or partially free access to full texts. These journals achieve OA publishing by providing full texts of current and back issues on their official websites, yet they often lack publicly disclosed OA policies or clear licensing agreements. Additionally, the use of paid services on third-party platforms has led to ambiguity regarding the essence and rights of OA. According to statistics, bronze OA journals account for approximately 37% of all OA journals in China, of which 91% are Chinese-language journals[5]. OA requires authors to retain the copyright of their papers, while authorizing journals to publish and distribute them. Authors are expected to select a licensing agreement that specifies how others may use the published paper, and journals then release the paper under the chosen license. Journals often offset losses in copyright management by charging APCs. In contrast, well-established and influential OA journals typically implement comprehensive and refined OA policies, with standardized norms and safeguards ensuring journal quality. The weakness of Chinese bronze OA journals lies in the development and implementation of open access policies, particularly in areas such as copyright ownership, licensing agreements, and the transparency of APC charges. These factors also significantly influence scholars' willingness to participate in open access initiatives.

The Directory of Open Access Journals (DOAJ), as the world's largest OA journal database, has established its inclusion criteria as a gold standard for open publishing. DOAJ recommends the use of CC licenses or similar agreements. Among these, the CC BY license is the most commonly adopted by DOAJ-indexed journals, with 10 608 journals offering this option to authors, accounting for 51%[7] of the total. Most Chinese journals operate under the supervision of administrative and sponsoring institutions, necessitating the improvement of OA policies in line with their specific contexts. Journal publishers' understanding and application of relevant legal agreements and regulations require continuous practice and staying updated with the latest developments. With technological advancements and evolving information environments, copyright issues have garnered increasing attention—not only concerning full-text services but also extending to datasets, open-source software and code, as well as applications in data mining, deep learning, artificial intelligence models, and related fields. How journals can integrate into technological developments while safeguarding copyright remains an ongoing challenge.

[7] doaj.org/search/journals, accessed on August 27, 2024.

3.3.3.2 Standardizing the Journal Fee System

Most Chinese-language journals in China still adhere to the traditional page fee model, with generally low charges. The average fee for Chinese-language journals indexed in COAJ is 7340 RMB per article[8], which is lower than the APCs set by international publishers, typically ranging from $2000–$3000 per article and even exceeding $10 000 in some cases. The development of the majority of Chinese-language journals primarily relies on fiscal allocations and funding from sponsoring institutions, and a business model centered on APC profitability has not yet been established. With support from relevant authorities, English-language journals in China have gradually aligned with international open publishing standards—including open publishing policies, licensing agreements, and APC compliance—through collaborations with international publishing organizations. Chinese-language journals, however, must base their efforts on practical realities, establishing open access policies that align with international norms while adapting to China's journal management system. They should also strengthen price controls and develop an independent OA development model.

Journals serve scientific research and academic exchange, and their fee systems should prioritize the needs of authors while fully considering the current policy and research environment. In June 2024, cOAlition S updated its Price Transparency Framework, stipulating that only publishers using the *Plan S Price and Transparency Framework* are eligible to receive OA publishing funds from its members[6]. This framework covers the entire publishing chain, enabling a clear understanding of the cost breakdown per article and providing a basis for standardizing APCs. Journal management bodies can establish a publishing cost-profit analysis framework to clarify operational conditions and guide APC pricing. For stakeholders in the OA publishing chain—including authors, readers, funding agencies, and libraries—a reasonable and transparent pricing system helps clarify the allocation of funds, thereby enhancing trust in journals and safeguarding their publishing reputation.

3.3.3.3 Strengthening Quality Control

The transition to OA publishing represents a significant turning point in journal publishing models. First, from a medium perspective, OA publishing has largely moved away from print-based formats, necessitating a standardization of management models. Currently, China's journal management system primarily targets print publications, with publishing standards and review processes still centered on print versions. There is an urgent need to improve regulations governing online publications. Second, OA publishing is more than a simple shift of print content to digital platforms. It encompasses services tailored to the characteristics of the internet, requiring adherence to established internet standards. These standards are already well-developed and do not need to be reinvented. Finally, the emergence of new forms of scholarly output—such as data papers, software papers, and hardware papers—has expanded the scope of journal content beyond traditional text to include a wider range of research outputs. Concurrently, the rise and development of

[8] www.coaj.cn/, accessed on September 10, 2024.

generative artificial intelligence have elevated the importance of content quality management to a new level. Editors now require enhanced information literacy and proficiency with a broader array of information tools. They must develop high-quality, dynamically updated quality control methods to ensure that journals continue to play their unique role in the scientific research ecosystem.

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Chapter 4

Practices and Progress in New Evaluation Mechanisms for Chinese Scientific Journals

Daiqing YANG, Junhong WU and Xinyu ZHENG

Abstract

Currently, the influential evaluation systems for scientific journal in China mainly include the *China Scientific and Technical Journal Citation Reports (Core Edition)* compiled by ISTIC, the *Chinese Science Citation Database* maintained by NSLC and *A Guide to the Core Journals of China* compiled by Peking University Library (PKU Library). These three products have a long history, each with its own unique characteristics, and play a significant role in the academic community. In recent years, driven by the policy orientation of breaking away from the "SCI-only" and "Impact Factor-only" approaches in the evaluation of scientific journals, multiple departments and institutions have made important exploration and attempts at the practical level. A notable focus has been placed on establishing the "homogeneous equivalence" of Chinese and international journals and the evaluation of representative papers, yielding encouraging outcomes. Among these efforts, the *Categorized Directory of High-Quality Science and Technology Journals* and the *World Journal Clout Index Report* (hereinafter referred to as the WJCI Report), both supported by CAST, have become representative tools for homogeneous equivalence evaluation of journals, while the *Essential Academic Database* of CNKI and the *"Frontrunner 5000 (F5000) – Top Academic Papers in China's Outstanding Scientific Journals",* published annually by ISTIC, have become prominent examples for identifying high-quality papers.

The evaluation of science and technology acts as a critical "guiding baton" for scientific journals. It helps measure journal performance, examine publication outcomes, identify shortcomings, and seek directions for improvement. It also assists literature procurement units in better acquisition plans, enhancing procurement quality, and optimizing acquisition expenditures. Moreover, it provides information reference and support for the evaluation of scientific and technological research outputs, projects, and academic talents. Developing a fair, authoritative, and scientific evaluation system for

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scientific journals is not only an objective necessity for the healthy development of the journals themselves, but also of great significance for fostering a favorable academic research environment and stimulating academic creativity and vitality. Consequently, it is urgent to realize a scientific journal evaluation system with Chinese characteristics and to gain independent academic evaluation rights.

4.1 Evaluation Practices for Chinese Scientific Journals

The evaluation of Chinese scientific journals plays a pivotal role in contextualizing the nation's research output. Unlike in foreign countries, the influential core journal evaluation institutions in China are all professional evaluation agencies subordinate to public institutions, which carry a distinctly official character. Currently, the widely recognized core journal evaluation products include the *China Scientific and Technical Journal Citation Reports (Core Edition)* compiled by ISTIC, the *Chinese Science Citation Database* (CSCD) maintained by the National Science Library of CAS, and *A Guide to the Core Journals of China* compiled by PKU Library. These three products have a long history, each with its own unique characteristics, and play a significant role in the academic community.

4.1.1 Development of Chinese Scientific Journal Evaluation

Major countries around the world all evaluate the scientific journals they have launched. Among them, Impact Factor-based journal evaluation currently holds an important position globally. For instance, the Impact Factor released by Clarivate and the CiteScore released by Elsevier have long been key metrics of focus for international journals. To address the inherent limitations of the Impact Factor, a series of alternative quantitative indicators have gained prominence, such as H5-index by Google Scholar and Altmetric from Digital Science, which are now also applied relatively widely in journal evaluation.

In China, theoretical research on journal evaluation commenced in the 1970s. Specialized evaluation agencies began their work in the 1980s, with initial efforts concentrated mainly on the natural sciences. Gradually, a journal evaluation system combining quantitative bibliometric analysis and qualitative expert assessment has taken shape in the library and information science field.

The three primary academic evaluation institutions for domestic scientific journals are: ISTIC with its *Chinese S&T Journal Citation Reports (Core Edition),* the National Science Library, CAS with its CSCD, and PKU Library with *A Guide to the Core Journals of China*. Besides these three established research institutions, other entities such as CNKI, Wanfang Data Co., Ltd., and Chongqing VIP Information Co., Ltd. also publish and release related journal evaluation tools or reports. However, in terms of the perceived authority and overall influence of the issuing bodies, these alternatives generally maintain some distance from the traditional trio of academic evaluation institutions.

The core journal evaluation systems maintained by ISTIC, NSLC, and PKU Library differ in their initiation times, underlying purposes, and developmental trajectories. They conduct their core journal selections independently, guided by their respective institutional positioning and mandates. Chronologically, ISTIC was the first to engage in large-scale statistical analysis of scientific papers. Entrusted by MOST, it began statistical work in

1987 focusing on the quantity and citation patterns of papers published by Chinese scientific and technical personnel, both within China and internationally. This statistical data formed the foundation for the *Chinese Science and Technology Paper and Citation Database* (CSTPCD). The statistical results derived from this database are incorporated into the *China Statistical Yearbook* and *China S&T Statistics Yearbook*, compiled by the National Bureau of Statistics and MOST, and are widely utilized by S&T management departments and the academic community. The list of source journals for the CSTPCD is updated annually.

In 1989, the CSCD was established by NSLC. It aims to reveal the context of scientific research through journal selection and the use of citation networks, thereby providing scholars with richer avenues for information discovery and access to more significant information. The CSCD has evolved alongside developments in data services. Building on its information service characteristics, it has integrated services ranging from information discovery to ensuring information access, including features like full-text linking, document delivery, and reference consultation, thus providing comprehensive channels for obtaining full-text documents and resolving research queries. Journals indexed by CSCD are updated every two years.

A Guide to the Core Journals of China (hereafter referred to as Guide) originated in 1990. And it was jointly initiated and compiled by the Beijing Academic Library Journal Work Research Association and the PKU Library. Its first edition was published in 1992. Prior to 2008, this Guide was updated, and published every four years. After 2008, the renewal and publishing cycle was changed to every three years instead. Its scope covers journals across multiple disciplinary fields, including "Humanities and Social Science", "Science", "Engineering", "Agriculture", and "Medicine". Adhering to selection principles that emphasize comprehensive discipline coverage, appropriate journal selection, standardized editorial processes, complete volumes/issues, a large user base, and accurate statistics, this Guide selects and evaluates journals from a wide array of sources. It serves as an important reference tool, providing decision support for journal collection management and scientific analysis in library and information institutions.

4.1.2 Characteristics of Chinese Scientific Journal Evaluation Systems

China's mainstream core journal evaluation systems exhibit certain overlaps in their coverage of source journals, yet each maintains its own distinct focus. In terms of methodology and process, while all systems integrate both quantitative and qualitative approaches, notable differences exist in their specific implementations.

Regarding the number and scope of disciplines covered, the *Chinese S&T Journal Citation Reports (Core Edition)* is the most extensive, encompassing both natural sciences and social sciences across a total of 112 disciplines. Since 2024, it has further expanded to include popular science journals by publishing the *Chinese S&T Journal Citation Reports (Popular Science Volume)*. The latest Core Edition includes 2165 scientific and technological journals, 407 social science journals, and 45 popular science journals[1]. In comparison, the CSCD, developed by NSLC, focuses primarily on journals within natural sciences. It covers core Chinese and English scientific journals across 60 categories, including

mathematics, physics, chemistry, astronomy, earth sciences, biology, agricultural and forestry sciences, medicine and health, engineering technology, and environmental sciences. As of August 2024, the CSCD includes 1341 source journals, containing over 6 480 000 article records and more than 11 000 000 citation records. *A Guide to the Core Journals of China* includes only Chinese-language journals and does not yet incorporate English scientific journals published in China. It spans 74 disciplinary categories, with the latest edition (2023 version) listing 1987 core journals.

In terms of evaluation indicators and procedures, the selection of core journals in China is uniformly developed by national authoritative departments or institutions, garnering widespread attention and recognition across various sectors of society. All three major evaluation systems employ a hybrid model that combines quantitative and qualitative assessment. However, their quantitative indicators emphasize different aspects (see table 4.1), and their evaluation processes, disciplinary classification systems, release methods, and update cycles also vary. Among them, both the CSTPCD and the CSCD independently construct their citation databases and provide online platform services. In contrast, the primary output of *A Guide to the Core Journals of China* has traditionally been its printed journal directory, which serves as a key reference tool.

Overall, China's quantitative indicators are still primarily based on traditional bibliometric indicators (such as Impact Factor, citation frequency, etc.), while also including supplementary metrics from the internet era like Web downloads. Nevertheless, these largely remain measures of external impact characteristics. A deeper, content-based assessment is primarily integrated through qualitative evaluations conducted by field-specific experts.

In terms of qualitative evaluation, the methodologies and processes employed by China's three most representative core journal systems differ from one another. Taking *A Guide to the Core Journals of China* as an example, it involves as many as several thousand experts in the review process, and organizing such a large-scale collaborative expert review is no easy task. The *Chinese S&T Journal Citation Reports (Core Edition)* adopts a two-stage expert review model correspondence review and in-person meeting review. In the correspondence review stage, peer reviewers from the same specialized subfield evaluate the journals; those that pass this stage proceed to the meeting review, where they are assessed by experts from the broader discipline. Conversely, the CSCD employs an expert committee model to evaluate the source journals included.

4.2 Reform and Exploration of Academic Evaluation Mechanisms

In recent years, China has both abolished outdated practices and established new ones in the field of scientific journal evaluation. These efforts aim to build academic discourse power, engage in global academic governance and competition, restore cultural confidence, accelerate the development of world-class domestic journals, and promote their prosperity. To support these goals, a series of policy documents have been issued to strengthen top-level design and clarify the reform orientation. Meanwhile, at the practical level, multiple departments and institutions have carried out important explorations,

Tab. 4.1 – Comparison of indicators across three major core evaluation systems.

Indicator name	CSTPCD	CSCD	PKU Core	Indicator name	CSTPCD	CSCD	PKU Core
Total Citations	√		√	Cited Half-life	√		
Impact Factor	√		√	Deviation Rate from Mean	√		
Non-self-citation Impact Factor			√	Red Point Indicator	√	√	
5-year Non-self-citation Impact Factor		√	√	Comprehensive Evaluation Score	√		
Immediacy Index	√			Eigenfactor		√	√
Non-self-citation Rate	√		√	Citing Journal Proportion		√	
No. of Citing Journals	√			Ratio of Cited to Published Papers		√	
Openness Factor	√			Citation Index		√	√
Divergence Factor	√			Disciplinary Non-self Citation Frequency		√	
Subject Impact Indicator	√			Hotspot Index	√	√	
Cited Half-life	√			Abstract/Full-text Inclusion Count			√
No. of Source Titles	√			Abstract/Full-text Inclusion Rate			√
Literature Selection Rate	√			Paper Influence Score			√
No. of AR Papers[1]	√			Paper Cited Index			√
Average References	√			Awards/Indexing by Major Systems			√
Average Authors	√			Download Times			√
Geographical Distribution	√			Download Ratio			√
Institutional Distribution	√			Citable Paper Ratio			√
Overseas Paper Ratio	√			Five-year Citable Paper Ratio			√

[1]AR papers: the total count of original research articles and review articles published in a journal, indicating the volume of its academic research output.

emphasizing the "homogeneous equivalence" of Chinese and foreign journals and the evaluation of representative works, and have achieved positive results.

4.2.1 Homogenous Equivalence Evaluation of China's and International Journals

4.2.1.1 Compilation of the Tiered Directories of High-Quality Scientific Journals

1) Overview

Since 2018, CAST has been carrying out the work of establishing graded directories of high-quality scientific journals. It issued the *Implementation Plan for the Subfield Publication of Tiered Directories of High-Quality Scientific Journals by Field (Trial).* Initially, six national societies—including the Geological Society of China, the China Association of Chinese Medicine, and the Nonferrous Metals Society of China—were selected as the first batch of pilot units to release the graded directories of high-quality scientific journals.

On December 29, 2018, CAST issued the *CAST Planning Outline for Building a World Leader in Science and Technology,* which proposed to "explore the subfield publication of tiered directories of high-quality academic journals in the natural sciences, conduct global selection, recognition, and promotion; promote the homogeneous equivalence of domestic and international journals, as well as Chinese- and English-language journals; guide journals to focus on improving their academic standards; and encourage outstanding research results to be first published in (China's) high-quality journals".

In the *Compendium of Tiered Directories of High-Quality Scientific Journals* released by CAST in December 2022, a total of 6906 academic journals across 41 disciplinary fields were included (table 4.2). Most societies categorized journals into three tiers: T1, T2, and T3. Among these, T1 refers to journals that are close to or have reached top international levels; T2 denotes internationally well-known journals with high academic standards; and T3 includes high-quality domestic and international journals widely recognized within the academic community.

Analysis of the directories reveals considerable variation in the number of journals covered across different disciplines, as well as in the proportional distribution of T1, T2, and T3 journals. It is worth noting that the geophysics field also defined a T4 journal category. In contrast, the traditional Chinese medicine and automation fields defined only T1 and T2 categories. Meanwhile, the Information and Communication Society classified only domestic journals into T1, T2, and T3, without applying the same tiering to the 35 foreign journals included in its list.

2) Typical Cases of Journal Tiered Directories

(1) Practice of Compiling the Journal Tiered Directory in Automotive Engineering

The tiered directory of journals in the field of automotive engineering is compiled under the leadership of the China Society of Automotive Engineers (China-SAE). It adopts a journal evaluation method that combines subjective and objective approaches, establishes an organizational structure (see figure 4.1) for implementing the graded directory of scientific and technological journals, and clearly defines the responsibilities of each institution.

Tab. 4.2 – Journal Distribution reported in CAST's scientific journal tiered directories.

No.	Discipline	T1		T2		T3		Total no. of journals	Remark
		No. of journals	/%	No. of journals	/%	No. of journals	/%		
1	Safety Science	13	28.89	14	31.11	18	40.00	45	
2	Armament Science and Technology	21	18.58	40	35.40	52	46.02	113	
3	Materials Failure and Protection	16	15.69	47	46.08	16	15.69	102	Including 23 high-level Chinese journals (not tiered)
4	Materials Science-Comprehensive	77	20.87	172	46.61	120	32.52	369	
5	Physical Geography	138	33.99	119	29.31	149	36.70	406	
6	Geophysics	21	8.50	27	10.93	75	30.36	247	Including 124 T4-level journals
7	Geology	177	28.87	277	45.19	159	25.94	613	
8	Simulation Science and Technology	12	24.49	15	30.61	22	44.90	49	
9	Textile Science and Technology	8	18.60	15	34.88	20	46.51	43	
10	Highway Transportation	24	31.17	24	31.17	29	37.66	77	
11	Management Science	137	13.16	419	40.25	485	46.59	1041	
12	Optical Engineering and Optics	14	15.91	30	34.09	44	50.00	88	
13	Navigation	15	35.71	14	33.33	13	30.95	42	
14	Aeronautics and Astronautics	11	17.74	22	35.48	29	46.77	62	
15	Nuclear Science & Technology	18	20.22	31	34.83	40	44.94	89	
16	Nursing	22	25.00	23	26.14	43	48.86	88	
17	Environmental Sciences	22	13.66	45	27.95	94	58.39	161	

Tab. 4.2 – (continued).

No.	Discipline	T1		T2		T3		Total no. of journals	Remark
		No. of journals	/%	No. of journals	/%	No. of journals	/%		
18	Mechanical Engineering	6	12.24	18	36.73	25	51.02	49	
19	Computing	16	23.53	23	33.82	29	42.65	68	
20	Architectural Science	36	32.14	35	31.25	41	36.61	112	
21	Naval Architecture and Marine Engineering	22	20.37	37	34.26	49	45.37	108	
22	Clinical Medicine	137	25.05	147	26.87	263	48.08	547	
23	Coal Science & Technology	8	13.56	25	42.37	26	44.07	59	
24	Energy and Power Engineering	36	29.75	38	31.40	47	38.84	121	
25	Automotive Engineering	8	33.33	16	66.67		0.00	24	
26	Ecology	37	20.90	64	36.16	76	42.94	177	
27	Mathematics	62	14.09	170	38.64	208	47.27	440	
28	Railway Transportation	26	28.89	36	40.00	28	31.11	90	
29	Inorganic Non-metallic Materials	27	34.18	33	41.77	19	24.05	79	
30	Cell Biology	11	28.21	12	30.77	16	41.03	39	
31	Information and Communication	13	17.33	13	17.33	14	18.67	75	Including 35 international journals not in T1 ∼ T3
32	Geotechnical Mechanics and Engineering Geology	29	22.48	43	33.33	57	44.19	129	
33	Metallurgical Engineering and Metal Materials	30	22.06	42	30.88	64	47.06	136	
34	Instrumentation Technology	13	23.64	15	27.27	27	49.09	55	
35	Nonferrous Metals	48	22.64	74	34.91	90	42.45	212	

Tab. 4.2 – (continued).

No.	Discipline	T1		T2		T3		Total no. of journals	Remark
		No. of journals	/%	No. of journals	/%	No. of journals	/%		
36	Preventive Medicine and Hygiene	22	18.03	41	33.61	59	48.36	122	
37	Vibration Engineering	15	17.24	35	40.23	37	42.53	87	
38	Plant Science	21	14.69	39	27.27	77	53.85	143	Including 6 high-quality Chinese journals (not tiered)
39	Traditional Chinese Medicine & pharmacology	11	28.95	27	71.05	0	0.00	38	Only including T1 and T2-tiered journals
40	Automation Technology	134	43.09	177	56.91	0	0.00	311	Only including T1 and T2-tiered journals
41	China's Outstanding Popular Science Journals	—	—	—	—	—	—	50	All are high-quality Chinese journals not in T1 ∼ T3

Note: Disciplines are listed alphabetically.

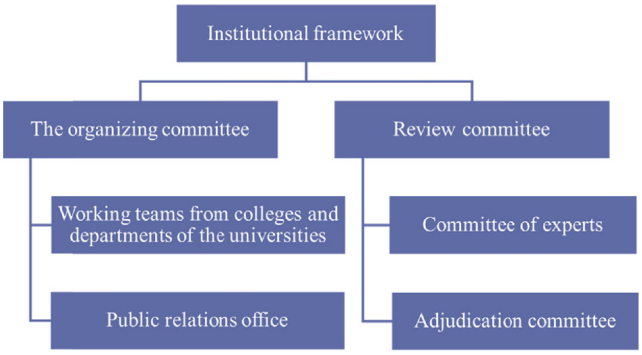


FIG. 4.1 – Organizational structure of the journal grading directory by China Society of Automotive Engineers.

The organization structure comprised an Organizing Committee and a Review Committee. The Organizing Committee consists of a University Faculty Working Group and a Publication Office. The University Faculty Working Group is primarily responsible for recommending journals and mobilizing automotive science and technology professionals to participate in the preliminary evaluation. The Publication Office is mainly responsible for the coordination of the journal grading process and related routine services, including drafting documents, conducting formal reviews of journals, collecting and processing feedback and suggestions on the graded directory, as well as publishing, promoting and facilitating the application of the tiered directory.

After finalizing the graded directory of journals, China-SAE extensively solicited opinions and suggestions from researchers and experts in the automotive engineering field. It conducted comprehensive promotion through its academic exchange platforms, young scholar forums, and new media channels. The graded directory has been recommended for use in various high-level platforms, including the China Automotive Industry Technology Science Award, the China-SAE Young Talent Support Project, and the selection of outstanding doctoral dissertations. It garnered significant attention from leading universities, such as Tsinghua University, Jilin University, Beijing Institute of Technology, Tongji University, and Beihang University, demonstrating positive practical application outcomes.

(2) Practice of Compiling the Journal Tiered Directory in Traditional Chinese Medicine

Since 2019, the China Association of Chinese Medicine (CACM), jointly with the China Academy of Chinese Medical Sciences, has been working on the compilation of a tiered directory focused on journals in the field of Traditional Chinese Medicine (TCM). The working mechanism for the tiered directory of TCM journals consists of seven parts (see figure 4.2).

A total of 38 TCM journals have been selected into the tiered directory, of which 31 have been consistently included in the *Chinese S&T Journal Citation Reports (Core Edition)* for five consecutive years. The analysis here focuses on these 31 TCM journals that have consecutively appeared in the directory for five years, together with 938 journals from various fields.

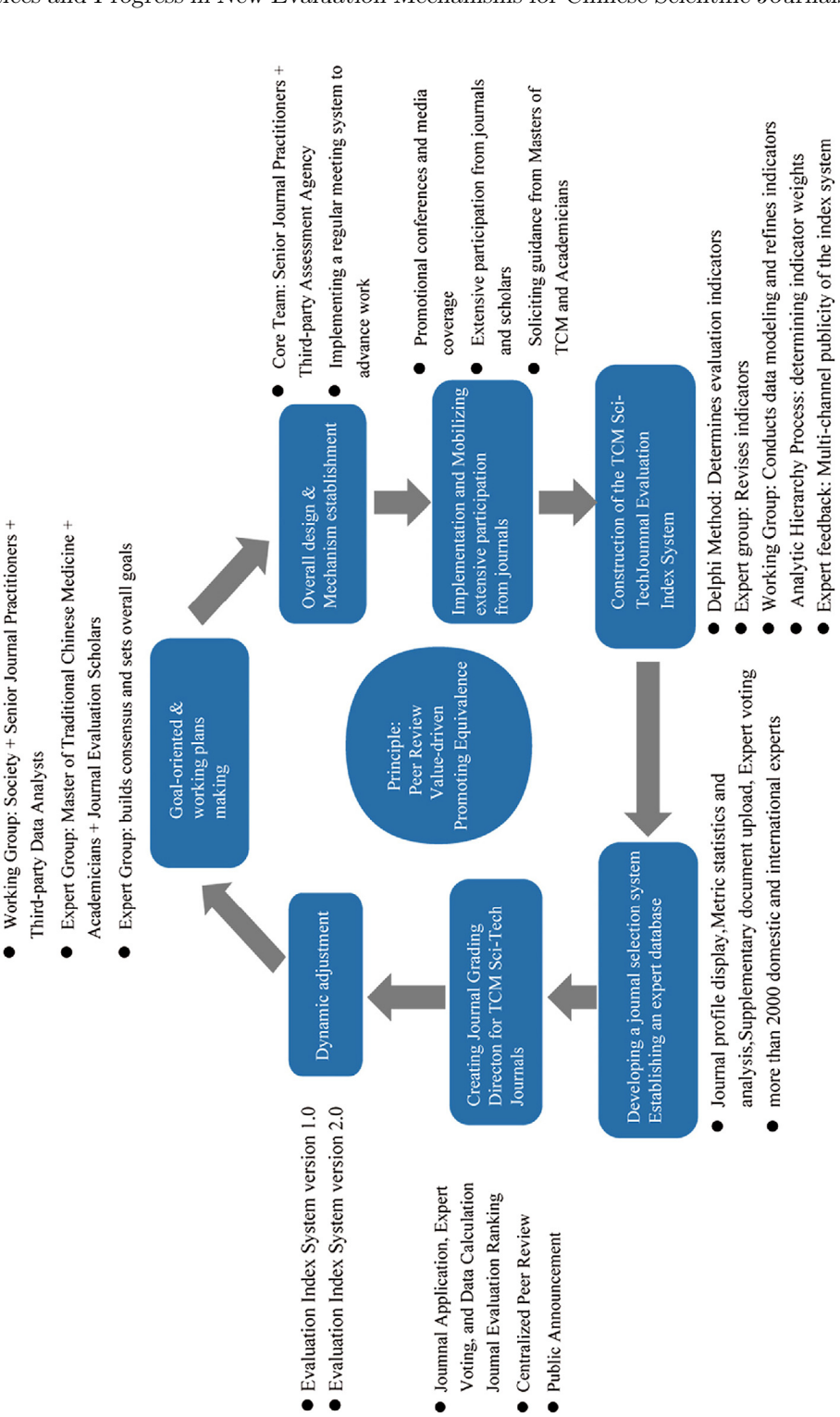


FIG. 4.2 – Working mechanism for compiling the TCM journal grading directory.

From 2018, the total citation frequency and the impact factor of journals in the TCM graded directory have demonstrated a significant growth, with impressive increases of 43.6% and 72.8%, respectively. These rates notably outpace those observed for the overall catalogue journals (27.0% and 60.2%, respectively). In recent years, the influence of TCM graded directory journals in academic exchange has markedly improved, and their academic impact has also increased rapidly. Since 2018, the impact factor of journals in the TCM tiered directory has shown a significant upward trend, with a growth rate of 72.8%, higher than that of the overall tiered directory journals (60.2%), indicating a rapid increase in academic influence.

Recognition for the TCM scientific journal tiered directory is notably high among TCM research institutions and universities. Prominent institutions such as the China Academy of Chinese Medical Sciences, Beijing University of Chinese Medicine, Beijing Hospital of Traditional Chinese Medicine, and Capital Medical University, along with several local research institutes and universities, have now adopted the tiered catalogue as a significant criterion in their talent evaluation processes. Notably, many of these institutions equate publications in T1 journals with SCI-indexed journals, underscoring the catalogue's established authority.

3) Outcomes of the Journal Tiered Directories

The tiered directories have gained high recognition from domestic universities and research institutions in certain disciplinary fields. For example, in many Chinese 211 universities[1], the schools of economics and management have basically adopted the journal tiered directory released by the Chinese Society of Optimization, Overall Planning and Economic Mathematics, mainly for faculty promotions and student graduation requirements. When applying for Distinguished Young Scholar[2] Fund or Excellent Young Scholar[3] Fund, management schools at many Chinese universities and young researchers in the management field will mark, among their representative works, whether the journal is rated as T1 or T2. Research conducted by the China-SAE revealed that numerous Chinese universities utilize the automotive engineering tiered directory in talent selection and professional title evaluations, with some institutions equating T1 journals with SCI-indexed journals.

Experts from the Chinese Mathematical Society reported that after the tiered directory was released, they received feedback and inquiries from the editorial offices of several international journals, requesting adjustments to the tier assigned to atheir journals in the directory. This indicates that the tiered directory in the field of mathematics has a certain influence both in China and abroad. Similarly, after the Chinese Society of Aeronautics and Astronautics released its tiered directory, it received inquiries from international SCI-indexed journals asking why they were not included in China's High-Quality Scientific

[1]211 universities refers to the approximately 100 higher education institutions that the Ministry of Education of China has designated as key universities for prioritized development in the 21st century.

[2]Recipients of the NSFC's National Science Fund for Distinguished Young Scholars, which supports outstanding early-career researchers in basic research to independently select research topics and conduct innovative work.

[3]Recipients of the NSFC's Excellent Young Scholar Fund, which supports accomplished scholars with solid achievements in basic research to carry out innovative research independently.

Journal Tiered Directory, suggesting that this initiative has attracted attention from the international publishing community.

As the next step, efforts to promote the tiered directories of journals will be intensified, with enhanced top-level design and category-specific guidance. This will ensure that the graded directory is effectively applied in key areas such as academician selection, professional title evaluation, talent recommendation, and project review. The objective is to enhance the influence and industry recognition of the tiered directories in a top-down manner, promote its adoption across disciplines and institutions at the national level, and to foster a broad-based understanding of the practical significance of homogeneity and equivalence, as well as the role of national evaluation systems for scientific journals in shaping discourse power. This will encourage more research institutions to recognize and adopt the graded directory, ultimately contributing to the formation of China's own journal evaluation system.

4.2.1.2 Compilation of the WJCI Report

1) Background and Objectives

Due to the limited distribution and service scope of existing databases, both home and abroad, various non-English language journals are not adequately included. As a result, the journal evaluation metrics currently published based on such databases fail to objectively reflect the global impact of scientific journals. This is because they neither account for the impact of journals from non-English-speaking countries on scholars worldwide. Relying on such incomplete evaluation systems is detrimental to the healthy development of non-English academic journals.

Funded by the CAST, the WJCI Report was jointly developed by CNKI, ISTIC, Tsinghua University Library, Beijing Wanfang Data Co., Ltd., the Chinese Society for University Science and Technology Journals and the Chinese Society of Scientific and Technical Periodicals. The latest evaluation report for each statistical year is released every November and is accessible free of charge at: http://wjci.cnki.net/.

The WJCI Report aims to establish a more scientific, comprehensive, objective, and effective comprehensive evaluation system that accurately reflects the academic influence of journals. It seeks to showcase the development level of academic journals worldwide, including those from developing nations, and to highlight the publishing and dissemination capabilities of excellent scientific journals from various countries in serving global scientific and technological innovation, as well as their resulting academic impact. For China's journal community, it provides a world-class scientific journal evaluation reference system, helping to accurately identify their international positioning, support the broader goal of building world-class journals, encourage the first publication of outstanding research results in domestic journals, and facilitate the implementation of the national scientific and technological innovation strategy.

Since its initial release in 2020, the WJCI Report has been widely disseminated and used by journals. As of December 25, 2023, the total visits to the WJCI release website reached 347 300, and journal inclusion certificates were downloaded 12 700 times.

2) Research Methods and Core Indicators

Based on thorough research into domestic and international journal databases and their evaluation outcomes, the WJCI Report focuses on the selection of source journals, the design of evaluation indicators, and journal disciplinary classification. It has independently established underlying support databases, such as the World Citation Database.

(1) Selection of Source Journals

The research team decided to select approximately 15 000 most outstanding journals worldwide, representing about one-quarter of the estimated 68 000 active scientific academic journals globally, as the source journals. The selection principles for WJCI source journals emphasize regional and disciplinary representativeness. The finalized source journals come from 93 countries and regions. The top three countries by the number of source journals are the United States (3977), the United Kingdom (3084), and China (1772) (figure 4.3).

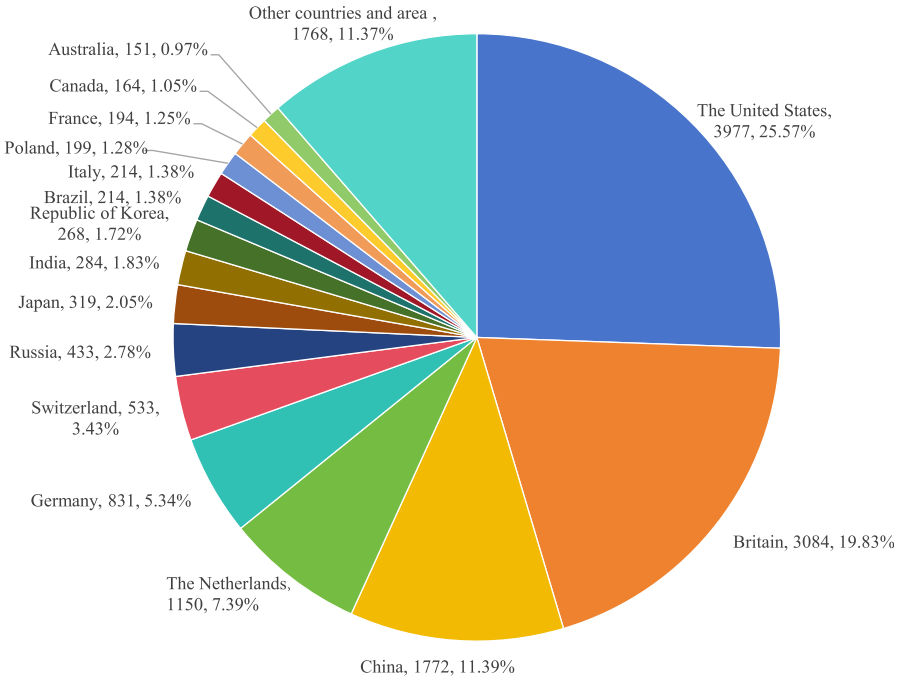


Fig. 4.3 – Regional distribution of source journals in the 2023 WJCI report.

To ensure the comparability of journal evaluation indicators, the WJCI Report classifies journals into 296 disciplinary fields for evaluation.

(2) Innovation in Evaluation Indicators

The WJCI Report utilizes the citation-based "World Academic Impact Index (WAJCI)" and the "Web Impact Index (WI)" based on the web usage data to construct a comprehensive evaluation system from three dimensions:

① Introducing the "WAJCI", which organically integrates the dual indicators of total citation frequency and impact factor, embodying the principle that "journals should be both high-quality and have broad reach".

② Introducing the "Journal Mass Index (JMI)"[2] as an alert metric to weed out low-quality, high-volume "bloated journals".

③ Innovatively proposing the "Web Impact Index (WI)" to reflect the rapid knowledge dissemination and service capabilities demonstrated by journals in digital publishing and online communication.

This comprehensive evaluation system overcomes the limitations of using a single indicator —the "Impact Factor" —for journal evaluation, making the results of journal impact assessment more comprehensive and objective[3].

3) Performance of Chinese Scientific Journals in the WJCI

The 2023 WJCI Report includes 1772 journals from China, accounting for 11.39% of the total. Among these, 430 are English-language journals and 1342 are Chinese-language journals.

By comparing and analyzing the Chinese-language journals from China included in the WJCI Report with other journals, it can be seen that these selected Chinese-language journals have reached the same level as international scientific journals in terms of both impact factor and total citation frequency. As shown in figure 4.4, the journals selected for the WJCI Report are plotted in a log-log coordinate system with impact factor on the horizontal axis and total citation frequency on the vertical axis. Each point in the figure represents a journal. The gray scatter points represent international journals, the red scatter points represent China's English-language journals, and the other colors represent Chinese-language journals from China. The figure clearly shows that China's Chinese-language journals are well integrated among the international journals.

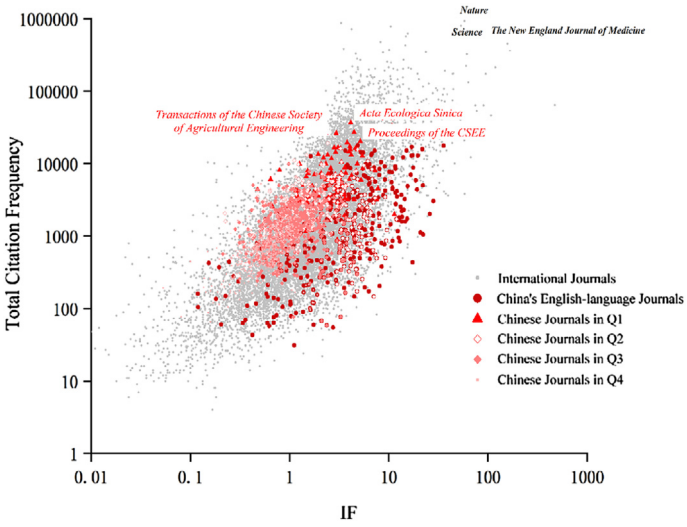


FIG. 4.4 – Log-log coordinate cloud map of impact factor *vs.* total citation frequency for WJCI journals.

4) Disciplinary Distribution of Chinese Scientific Journals in the WJCI

The 2023 WJCI Report includes 1342 Chinese-language journals. According to secondary discipline statistics, the discipline with the highest number of journals is "Clinical Medicine" (170 journals), while the discipline with the highest citation frequency from journals in other countries and regions is "Psychology" (6 journals, with an average citation frequency per journal of 1397.83) (table 4.3).

Tab. 4.3 – Discipline Distribution of Chinese scientific journals included in WJCI.

No.	Discipline	No. of journals	Total citations		Avr. citations per journal		Avr. IF per journal
			from China's journals	from global journals	from China's journals	from global journals	
1	Clinical Medicine	170	171 059	35 181	1012.18	208.17	0.840
2	Earth Sciences	116	277 956	67 786	2396.17	584.36	1.743
3	Agriculture	85	203 914	34 771	2398.99	409.07	1.519
4	Comprehensive Science	73	75 126	13 915	1029.12	190.62	0.826
5	Materials Science	62	97 641	18 384	1574.85	296.52	1.040
6	Biology	60	135 530	34 811	2258.83	580.18	1.185
7	Mining Engineering Technology	59	125 649	21 016	2129.64	356.20	1.987
8	Chemical Engineering	54	77 850	13 610	1441.67	252.04	0.988
9	Basic Medicine	50	78 242	14 935	1564.84	298.70	0.833
10	Electronics & Communication Technology	50	55 872	9270	1140.24	189.18	0.886
11	Environmental and Resource Science and Technology	45	134 015	26 774	2978.11	594.98	1.664
12	Computer Science	45	68 280	16 967	1517.33	377.04	1.200
13	Power and Electrical Engineering	41	125 705	13 400	3065.98	326.83	1.585
14	Preventive Medicine and Public Health	41	54 187	12 019	1321.63	293.15	1.031
15	Energy Science and Technology	39	140 637	18 971	3606.08	486.44	2.385
16	Transportation Engineering	39	51 879	8053	1330.23	206.49	0.980
17	General Engineering Technology and Fundamental Disciplines	37	90 868	21 898	2455.89	591.84	1.442
18	Civil Engineering	36	80 606	17 803	2239.06	494.53	1.235
19	Aeronautical and Space Science & Technology	36	39 446	5800	1095.72	161.11	0.866
20	Chemistry	34	36 275	19 693	1066.91	579.21	1.295

Tab. 4.3 – (continued).

No.	Discipline	No. of journals	Total citations		Avr. citations per journal		Avr. IF per journal
			from China's journals	from global journals	from China's journals	from global journals	
21	Comprehensive Medicine	33	29 799	8007	903.00	242.64	0.597
22	Mechanical Engineering	32	60 044	10 386	1876.38	324.56	0.918
23	General Engineering	29	44 886	7563	1547.79	260.79	1.005
24	Physics	29	38 394	11 241	1323.93	387.62	0.873
25	Information and Systems Science-Related Engineering and Technology	26	52 196	8800	2007.54	338.46	1.219
26	Hydraulic Engineering	26	47 889	7641	1841.88	293.88	1.608
27	Traditional Chinese Medicine & Pharmacology	23	89 059	15 943	3872.13	693.17	1.157
28	Animal Husbandry, Veterinary Science	23	51 670	4886	2246.52	212.43	1.129
29	Pharmacy	22	35 101	6856	1595.50	311.64	0.768
30	Forestry	22	32 384	5090	1472.00	231.36	1.322
31	Mathematics	22	16 319	4924	741.77	223.82	0.621
32	Food Science and Technology	21	79 909	8228	3805.19	391.81	1.323
33	Natural Science-Related Engineering and Technology	20	54 790	15 294	2883.68	804.95	1.182
34	Surveying and Mapping Science and Technology	18	28 164	5149	1564.67	286.06	1.263
35	Metallurgical Engineering Technology	17	19 065	2296	1121.47	135.06	1.036
36	Mechanics	17	15 733	2996	925.47	176.24	0.993
37	Safety Science and Technology	12	20 623	4399	1718.58	366.58	1.207
38	Aquatic Science	12	13 773	3826	1147.75	318.83	1.122
39	Textile Science and Technology	12	9784	953	815.33	79.42	0.566
40	Nuclear Science and Technology	10	5051	1114	505.10	111.40	0.383
41	Special Medicine and Forensic Medicine	8	3350	558	418.75	69.75	0.390

Tab. 4.3 – (continued).

No.	Discipline	No. of journals	Total citations		Avr. citations per journal		Avr. IF per journal
			from China's journals	from global journals	from China's journals	from global journals	
42	Psychology	6	10 647	8387	1774.50	1397.83	1.164
43	Information Science and Systems Science	6	7004	1505	1167.33	250.83	0.865
44	Instrumentation Technology	5	14 604	1699	2920.80	339.80	1.635
45	Astronomy	5	1554	505	310.80	101.00	0.479

Note: Listed in descending order by the number of journals.
Disciplines with the same number of journals are ranked in descending order of citations from China's Journals.
The discipline categorization follows the secondary discipline system of the 2023 WJCI Report.
The statistical coverage of China's journals refers to those with a CN number or registered with China as the country of publication in the ISSN International Centre.

4.2.2 Evaluation of Representative Research Works in China

In recent years, China has implemented several effective initiatives to evaluate the quality of research papers. These include the Academic Essentials Database developed by CNKI, the annual "Forerunner 5000 – Top Articles from China's Leading S&T Journals" selection organized by the ISTIC, and the "Selection Activity for Outstanding Academic Papers in Journals of CAST" conducted by CAST since 2003. Furthermore, at both governmental and institutional levels, there has been a gradual yet increasing application of the representative output system in talent selection and research outcome evaluation, with greater emphasis placed on identifying high-quality papers.

4.2.2.1 Practice of Developing the Academic Essentials Database

1) Background and Objectives

Academic papers, as important carriers of scientific research achievements, encapsulate scholars' innovative ideas. In recent years, with strong support and close attention from the Chinese government, China's scientific research activities have flourished, leading to one major breakthrough after another. Consequently, the number of papers published by Chinese scholars has also risen to a leading position globally. However, this surge in paper output has also highlighted uneven quality. Research management authorities have been compelled to widely adopt an evaluation approach that "judges a paper by the journal it publishes in", while continuously raising the bar for journal rankings. This has led to the misuse of core journals in talent assessment and even an "SCI-only" mindset.

To address this issue, multiple government departments have issued policy documents to guide the reform of research evaluation. These include the *Opinions on Deepening the Reform of Project Review, Talent Evaluation, and Institutional Assessment* issued by the

General Office of the State Council in 2018; the *Notice on Several Measures to Eliminate the Undue Emphasis on Papers in Science and Technology Evaluation (Trial)* issued by MOST together with the Ministry of Finance in 2020; and the *Notice on the Several Opinions on Regoring the Use of SCI Paper Related Indicators in Higher Education Institutions to Establish a Correct Evaluation Orientation* issued by the Ministry of Education and MOST. These policies aim to steer research evaluation toward a representative output system and reinforce a quality-oriented approach.

Although statistically, high-quality journals do publish a greater number of good papers, when it comes to evaluating an individual paper, the method of "judgding a paper by its journal" —using journal ranking as a substitute for directly assessing paper quality— is undoubtedly inaccurate. Moreover, this method carries significant side effects. For instance, it has led to an imbalance in the development of the journal industry: core journals face a surplus of manuscripts and publication delays, while ordinary journals suffer from manuscript shortages and low quality, resulting in polarization. A large number of excellent manuscripts flow out to SCI-indexed journals abroad, undermining the academic ecosystem in China.

Therefore, research evaluation should return to the evaluation of representative works – that is, the evaluation of individual papers–breaking away from various journal-based evaluation methods such as "SCI-only" "core journal-only" and "impact factor-only". Moreover, both journal evaluation and talent evaluation should be based on the evaluation of individual papers, fostering a consensus that "a journal that publishes many good papers is a good journal" and "a scholar who produces good research achievements is a good scholar". This requires journal databases to provide the necessary supporting tools.

In response to the needs of representative work evaluation, CNKI developed the Academic Essentials Database. It provides various quantitative indicators with qualitative evaluation significance to assist in the evaluation of individual academic papers and support the selection of scholars' representative works.

2) Article Evaluation Method and Process

CNKI has developed the Chinese Citation Database, which counts, for each academic paper, the frequency of citations by journal articles, conference papers, master's and doctoral theses, and books, as well as its frequency of downloads from the CNKI database, with updates made daily. The Academic Essentials Database selects academic papers published in the last decade whose discipline-specific citation frequency (excluding self-citations) ranks in the top 10%, and provides an *Individual Article Evaluation Report* for each paper.

Furthermore, the Academic Essentials Database identifies "High-Impact Papers": by grouping literature from the same discipline, same year, and same document type, it selects the top 1% of papers in each discipline based on the PCSI index[4], Non-self citation frequency and download frequency, respectively. These are designated as High-Impact Papers, and a "High-Impact Paper Certificate" is provided for each.

[4]PCSI Index (Paper Citation Standardized Index) is a relative impact evaluation metric derived from standardized citations. It reflects the gap between a paper's citation frequency and its average within the same discipline and year of publication, and enables comparisons of cited frequencies among individual papers between different years and disciplines. The theoretical mean PCSI across all disciplines is 1.65[4].

3) *Individual Article Evaluation Report*

The *Individual Article Evaluation Report* is one of the distinctive features of the Academic Essentials Database. Through detailed evaluation data, it provides detailed third-party supporting materials for assessing the paper's academic influence, disciplinary contribution, and academic value.

In supporting the evaluation of academic influence, the report provides further analysis of the paper's citation profile: The total citation frequency (excluding self-citations) and its disciplinary ranking reflect the paper's overall influence profile; the PCSI index reflects the paper's relative influence within the entire database; citation timeline analysis depicts the dynamic process of the paper's annual citations; the L-index helps identify the paper's classic nature and long-term effect; citation source analysis details the specific origins of citing documents, revealing the scope of its influence.

In supporting content quality evaluation, the report aggregates the citing excerpts referencing this paper found in other documents, unearthing subsequent researchers' academic assessments of the paper, as well as the paper's specific application and contribution in later academic discussions. With the development of artificial intelligence, AI can identify the intrinsic connections and logical chains between citing snippets, further extract the core arguments of a paper, and provide a comprehensive and structured overview of the paper's value for evaluation reference (figure 4.5).

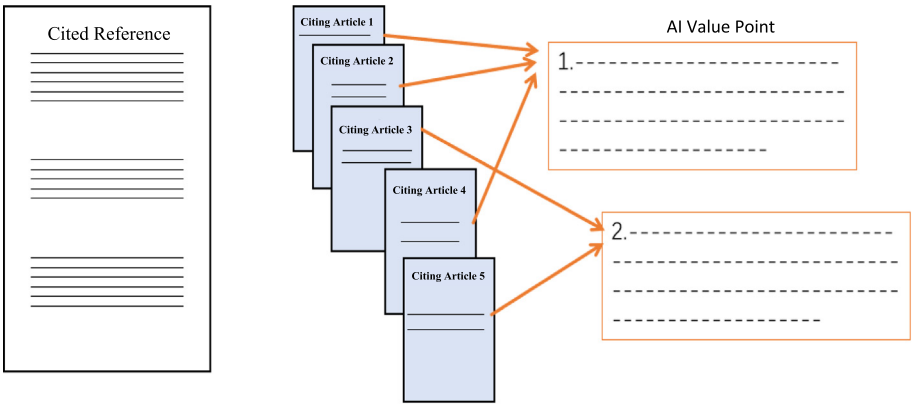


FIG. 4.5 – Process diagram for analyzing the core value points of a document.

In terms of revealing dissemination impact, the report provides the total download count of a document and its ranking within the discipline, as well as the number of times the document has been downloaded by scholars from key research institutions. At the same time, the report provides information on the level of the publishing journal in which the document was published, such as its which evaluation agencies have included it, its domestic and international impact indicators, and disciplinary rankings. This shows that the Single Document Evaluation Report is a valuable reference tool for academic evaluation. It helps enhance the credibility of representative work evaluation and promotes the return of academic evaluation to the evaluation of individual papers.

4.2.2.2 Forerunner 5000 – Top Articles from China's Finest S&T Journals

To further enhance the overall influence of China's scientific journals, better promote and disseminate outstanding research achievements in China, and facilitate the global reach of both Chinese journals and research outputs, the ISTIC launched the "Forerunner 5000 – Top Articles from China's Leading Scientific Journals" (hereinafter referred to as "F5000") project in 2012. Using a combination of scientometric indicators and peer review, the project annually selects outstanding academic papers from China's leading scientific journals and has established the "F5000 Platform". This platform showcases and exchanges China's excellent academic papers internationally through long English abstracts. By cooperating with major international information service providers and publishers, F5000 papers are systematically promoted to the international academic community. This provides an efficient channel for Chinese-language papers, their authors, and Chinese academic journals to integrate into the international academic community[5].

1) Selection Methods and Process

Combining quantitative and qualitative analysis, F5000 selects papers annually from those published in "China's Leading Scientific Journals" over the previous five years. The selection encompasses two sources: first, highly cited papers identified by ISTIC through scientometric analysis based on publication year and cumulative citation frequency; second, original papers nominated by journal editorial boards or selected through peer review based on research innovation, practical value, scientific rigor, and disciplinary leadership. ISTIC organizes expert panels to conduct comprehensive evaluations of both highly cited papers and editorial board recommendations, ultimately determining the F5000 papers.

Each year, the editorial boards of "China's Leading Scientific Journals" (including those selected in previous years) can select two research papers published of high academic level published that year through peer review of editorial board recommendations, and submit them to the F5000 platform. In each edition, over 300 finest journals are selected as "China's Leading Scientific Journals". From 2017 to 2021, a total of 274 leading journals recommended papers to the F5000 platform. Among them, 112 journals continuously recommended papers for five years and 133 journals did so for four consecutive years. The editorial boards have cumulatively recommended 4726 papers to the F5000 platform.

To break the undesirable tendency of "evaluating papers based on journals", ISTIC has provided a channel for non-leading scientific journals to be selected for the F5000 project. Chinese core S&T Journals may submit two papers approved by their editorial boards to the F5000 platform, and the platform will confirm their selection after organizing expert reviews.

As of September 2024, the F5000 system contains 26 288 papers, of which 21 847 are highly cited papers and 4441 are papers recommened by editorial boards and subsequently approved after review. The "China's Leading Scientific Journals" selected by ISTIC are predominantly journals in Chinese. For instance, among the 327 journals in the sixth edition of the Leading Scientific Journals, 300 are Chinese-language journals and 27 are English-language journals. Consequently, the number of Chinese-language papers (25 873)

[5] https://f5000.istic.ac.cn/reveal-paper.

in the F5000 system is significantly higher than that of English-language papers (415). Chinese-language papers primarily originate from fields such as "Electrical Engineering" "Chinese Materia Medica" "Agricultural General" "Comprehensive Energy Sciences" and "Agricultural Engineering", while English-language papers mainly come from "Comprehensive Medicine" "Aeronautical and Aerospace Science and Technology" "Comprehensive Materials Science" "Chemistry" and "Pharmaceutical Sciences". Table 4.4 shows the distribution of Chinese and English papers selected for F5000 from 2020 to 2024. Overall, the number of papers selected for F5000 has shown a growing trend in recent years, though a significant disparity remains between Chinese and English paper representation.

Tab. 4.4 – Distribution of Chinese and English papers selected into F5000 (2020–2024).

Year	No. of Chinese Papers	No. of English Papers	Total
2020	1631	23	1654
2021	1638	16	1654
2022	1662	23	1685
2023	3665	40	3705
2024	3299	153	3452

2) Achievements

In 2014, The F5000 project was included in the News and Publication Reform Development Project Repository of the former State Administration of Press, Publication, Radio, Film and Television. The second edition of the F5000 platform was launched in 2015, and the third version was released in 2024. Cumulative searches on the platform have reached 7 610 000 (as of August 20, 2024). Visitors to the F5000 platform widely come from leading domestic and international universities, research institutions, and national laboratories, such as Harvard University, Oxford University, and Argonne National Laboratory. International users primarily originate from over 140 countries and regions, including the United States, Russia, Canada, and the United Kingdom, essentially covering all major countries or regions globally. The top five countries by number of visitors are the United States, Russia, Canada, the United Kingdom, and the Czech Republic, with visits from the United States exceeding 190 000. Domestic users are distributed across all 34 provincial-level administrative regions in China.

The F5000 project has gained widespread recognition from domestic management authorities, mainstream media, and the academic community. The F5000 platform has been featured by media outlets such as People's Daily Online, China Daily, and Science and Technology Daily. It is regarded as a novel quality-oriented representative output evaluation tool and has played a significant supporting role in tasks such as scientific journal and talent assessment.

4.2.2.3 Analysis of the Homogeneous and Equivalent Evaluation for Chinese Scientific Journals and Papers

Significant progress has been made in China regarding the homogeneous and equivalent evaluation at both the journal and paper levels. At the journal level, the prominent

initiatives are the Tiered Directory of High-Quality Scientific Journals promoted by the CAST and CNKI's World Journal Clout Index (WJCI). At the paper level, the influential initiatives are CNKI's Academic Essentials Database and the ISTIC's F5000 project.

The Tiered Directory of High-Quality Scientific Journals is formulated using comprehensive quantitative methods, adhering to the principles of fair competition, equal treatment, objectivity and fairness, and quality first. It evaluates the innovation, academic rigor, and practicality of scientific journals, providing an assessment of the academic quality of global scientific journals. The development of tiered directories in key disciplines, specialized industries, and critical strategic fields, such as traditional Chinese medicine, railway transportation, aeronautics and astronautics, and ordnance science and technology, holds great significance. Future efforts should focus on filling gaps in uncovered fields, updating existing directories, enhancing their credibility and recognition, establishing them as academic credentials for professional societies, and improving services for the academic community.

The WJCI Report aims to establish a new journal evaluation system, exploring more scientific, comprehensive, and reasonable methods for assessing journal influence globally, and promoting the fair evaluation and equivalent use of scientific journals worldwide. The WJCI addresses the shortcomings of foreign evaluation systems like SCI, which overly focus on English-language journals, by establishing a unified indicator system to consistently evaluate scientific journals from major countries globally. It stands as a successful practical model for the equivalent evaluation of journals from non-English speaking countries. Future work needs to further expand its influence, optimize the citation database and indicator system, and strengthen the development of update and delisting mechanisms, thereby integrating more Chinese perspectives and wisdom into global academic evaluation.

Academic Essentials Database developed by CNKI and the F5000 project initiated by ISTIC are both relatively successful examples of homogeneous equivalent evaluation at the paper level. Both are designed to evaluate papers published in Chinese journals, while achieving homogeneous and equivalent evaluation of Chinese-language and English-language papers published in China. The Academic Essentials Database selects representative papers from various disciplines based on CNKI Resource Library and provides qualitative and quantitative evaluation data for individual representative papers. It selects highly-cited papers in each discipline and offers analyses from multiple dimensions. F5000, on the other hand, primarily selects papers published within the scope of "China's Leading Scientific Journals" (non-leading journals may also recommend papers through their editorial boards, but within a maximum of two papers per journal), and applies a combination of quantitative and qualitative methods for selection. The selection is conducted annually, covering papers published within the five years prior to the release year. Overall, there remains a considerable gap between China's individual-paper evaluation and databases such as Clarivate's ESI, in terms of both update frequency and impact. This calls for continuous improvement and optimization of the methodology systems and service platform, as well as joint efforts and commitment from all sectors of society.

4.3 Journal Evaluation Mechanisms Promote High-Quality Development of Chinese Journals

Scientific evaluation plays a crucial "guiding baton" role in the operations of scientific journals. It is essential to ensure that this guidance effectively benefits the main stakeholders of Chinese scientific journals, including publishers, related institutions, researchers, and practitioners, enabling them to work together through mutual learning, understanding, trust, and collaboration.

4.3.1 The Role of Journal Evaluation in Promoting High-Quality Development of Journals

Scientific journal evaluation helps publishers assess publication performance, measure effectiveness, identify shortcomings, and determine directions for improvement. For readers, it aggregates target journals, narrows the reading scope, and improves reading efficiency. For authors, it recommends high-quality journals, reduces the difficulty of journal selection, and focuses submission efforts. For journal acquisition units, it assists budget decision-makers in accurately formulating procurement plans, improving procurement quality, and optimizing expenditures. For scientific journal management departments, it helps managers systematically understand publication standards across regions, grasp disciplinary characteristics and the distribution of high-quality journals, and scientifically inform policy-making. For scientific research output management departments, it provides reference information and tool support for evaluating research outputs, projects, and talents. Furthermore, for entities formulating or implementing funding policies for scientific journals, evaluation work offers a basis for funding decisions, enables monitoring of the funding process, and helps assess overall funding effectiveness.

4.3.2 Evaluating Journals by Their Papers is the Trend for High-Quality Development of Chinese Journals

The most critical aspect of academic journal evaluation is the quality of the published papers. Paper quality is the core indicator of the academic level of the papers, which in turn reflects the standard of the journal. Therefore, returning to the "original intention" of academic journal evaluation entails assessing the quality of the academic papers a journal publishes. Evaluating the quality of these papers comprehensively reflects the journal's overall quality and publication standards, thereby realizing the principle of "evaluating journals by their papers".

Conduction collective peer review of individual paper quality through academic communities within a discipline, and then aggregating and summing up the collective evaluation results of papers through certain quantitative methods to subsequently evaluate journals – this is a relatively authentic way of "evaluating journals based on papers" that aligns with the true essence of academic journal evaluation. "Evaluating journals based on papers" is of great significance; however, it is often time-consuming, labor-intensive, and costly. Nevertheless, every new development faces challenges at the time of its emergence.

As long as we recognize the trend of moving toward "evaluating journals based on papers", the difficulties encountered along the way can be progressively overcome through further development.

4.3.3 AI Provides New Momentum for the Comprehensive Evaluation of Scientific Journals

Although the use of AI in scientific journal evaluation still requires further refinement, with the increasing volume of journal submissions, many reviewers have already begun using AI to assist in the review process to improve efficiency. Beyond accelerating review speed, AI algorithms, through pattern recognition and data analysis, can also help identify and mitigate certain biases in reviews, thereby promoting a fairer and more transparent evaluation environment. Furthermore, the rapid development of AI technology makes it feasible to genuinely assess the novelty and innovation of research based on paper content. Relevant studies also indicate a good level of consistency between AI and human experts in paper review[5]. It is believed that with the continuous advancement of large language model technology and the ongoing accumulation of data, AI-assisted peer review will demonstrate strong potential. Comprehensive AI-assisted evaluation systems for scientific journals are inevitably becoming a prevailing trend.

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