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Blue Book on China's Scientific Journal Development (2023)

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Blue Book on China's Scientific Journal Development (2023) relies on well-known domestic and international databases and first-hand official data. It employs scientific measurement methods to analyze existing problems, summarize development patterns, and to systematically organize the overall situation of China's scientific journals and papers. The Blue Book presents the overall status of China's scientific journals and papers in the form of data, analyzes and predicts the international development pattern of China's scientific journals based on the construction of top-tier journals. It also examines the current situation, composition, and trends of the talent team supporting the development of scientific journals, as well as policies and environments for talent development. The book assesses the opportunities and challenges for the innovative development of China's scientific journals and explores strategies for building world-class scientific journals in China.

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Preface

Scientific journals are vital carriers for preserving human civilization, showcasing scientific discoveries, and leading the development of science and technology. They serve as a significant reflection of a country's technological competitiveness as well as its cultural soft power. In recent years, China has accelerated the development of a world-class scientific journal system, achieving remarkable progress. A growing number of outstanding journals have entered the top tier globally, and an increasing number of high-quality research findings are being published in China-based journals. This will provide crucial support for achieving greater self-reliance and strength in science and technology.

The Blue Book on China's Scientific Journal Development is the first annual academic report documenting and reflecting the development course of China's scientific journals. The overall goal and positioning are to provide a systematic compilation, analysis, and projection of the overall situation of China's scientific journals and research papers from an independent perspective, using authentic data and empirical surveys. It aims to objectively and accurately reflect the current development status and existing problems, to draw insights from international best practices, to assess future development trends, to explore sustainable development paths, and to ultimately promote the high-quality development of China's scientific journals.

Over the past seven years, *the Blue Book on China's Scientific Journal Development* has dynamically presented the overall landscape of China's scientific journals through data. It has comparatively analyzed the quality status and growth trends of China's and foreign scientific journals using empirical research methods. It has inspired various perspectives on journal research and proposed clearer pathways and feasible suggestions for the development and growth of China's scientific journals. As a faithful record of the development process of China's scientific journals, the *Blue Book on China's Scientific Journal Development* has received widespread attention and recognition from journal professionals and scientific researchers since its inaugural release in 2017. Currently, the cumulative page views have exceeded 920 000, with over 3500 total downloads and nearly 800 citations

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across all editions. Meanwhile, the *Blue Book* has also garnered significant attention from international peers. The International Association of Scientific, Technical and Medical Publishers (STM) disseminated news of its English edition to key members, hailing it as the first serial publication to document the evolution of China's scientific journals. Furthermore, the annual STM reports have also incorporated data from this book to illustrate the current development status of scientific journals and research output in China.

According to the publication plan, the *Blue Book* follows a three-year cycle. The first year's edition presents an overview of China's scientific journal landscape, while the subsequent two years' volumes delve into thematic topics of current interest. The 2017 edition was the first to systematically sort out the overall situation and analyze the problems and challenges facing China's scientific journals. The 2018 edition, with the theme of Integrated Publishing of Scientific Journals, examined the development status of integrated publishing in China. The 2019 edition, themed Development Pathways for World-Class Scientific Journals, explored feasible paths, policy environments, support systems, and construction strategies for building top-tier scientific journals. Starting from the 2020 edition, the second cycle began. This edition compared data with the 2017 report, presenting a comprehensive view of China's scientific journals and research papers, and analyzing the development status and trends driven by industrial transformation and market integration. The 2021 edition, with the theme of Academic Publishing in the Open Science Environment, reviewed the evolution of open science, open science platforms, and progress in open publishing, discussing the development strategies of China's scientific journals within the open science context. The 2022 edition, with the theme of Academic Publishing and Communication Platforms in the Digital Economy Era, studied the transformation of digital publishing technology, the progress and trends of digital resources and academic communication platforms, proposing suggestions for the development of China's academic publishing integration and high-end academic communication platforms in the digital economy era. Since 2020, the English edition of the *Blue Book on China's Scientific Journal Development* has been published and distributed globally. The English version is the sole English-language document based on authoritative data, presenting the overall situation of China's scientific journals and showcasing the comprehensive picture of China's scientific journals and research papers to the international community.

As a comprehensive record of China's scientific journal landscape, the *Blue Book* places particular emphasis on accuracy and authority. From the outset, the initiating organization —the Service Center for Societies of the China Association for Science and Technology (CAST) established a core think tank comprising academicians from the Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE), along with experts in scholarly publishing. The Expert Committee, formed by academicians, renowned scholars, and industry professionals from relevant fields, draws expertise from institutions such as the National Press and Publication Administration (NPPA), CAST, CAS, CAE, the Ministry of Education, and relevant academic societies. This multi-stakeholder approach ensures that the compilation process is informed by strategic vision, educational excellence, and operational efficiency, guaranteeing the authority, professionalism, and forward-looking perspective of the content. The compilation working group, led by the compilation committee, mobilizes and coalesces leading research experts in China's scientific journal publishing domain. Adhering to the principles of Openness, Collaboration, and Sharing, the group has intensified research efforts while expanding its scope of inquiry. Throughout

the research and compilation process, the group strives to foster a vibrant research environment that encourages debate, conducting its work precisely through such discussions and intellectual contentions.

As an inaugural edition of the third cycle, the 2023 edition continues to present a data-driven overview of the current state of China's scientific journals and research output. This edition expands the analytical scope and deepens the substance of the *Blue Book*, ensuring its alignment with the overarching requirements for building world-class scientific journals in the new era.

Chapter One: Overview of China's *Scientific Journals*, systematically examines the scale, disciplinary distribution, operational conditions, human resource structure, publishing management systems, funding sources, operational status, and new media development of China's scientific journals. Utilizing authoritative data from NPPA's annual journal inspections, CNKI's Annual Report for Chinese Academic Journal Impact Factors, Annual Report for International Citation of Chinese Academic Journals, and the World Journal Clout Index (WJCI) of Scientific and Technological Periodicals, it presents a macro-level analysis of development trends and digital transformation achievements from 2017 to 2023.

Chapter Two: Impact Analysis of China's Scientific Journals, conducts a discipline-specific analysis of China's scientific journals, leveraging evaluation systems including the Annual Report for International Citation of Chinese Academic Journals and the World Journal Clout Index (WJCI) of Scientific and Technological Periodicals. This chapter investigates key metrics, including the volume of citable literature, domestic impact indicators (*e.g.*, Composite Impact Factor, Total Cited Frequency), and international metrics (*e.g.*, International Cited Ratio, Journal Clout Index). Through longitudinal comparisons of recent data, this chapter objectively reveals evolution trends in journal impact and their correlation with disciplinary development.

Chapter Three, Current Situation of China's Popular Science Journals, comprehensively surveys the publishing scale, geographical distribution, and content positioning of domestic popular science journals, integrating registration data from NPPA with new media platform monitoring data. This chapter focuses on evaluating their new media dissemination capabilities (*e.g.*, platform coverage, content update frequency) and communication effectiveness (*e.g.*, user engagement, knowledge diffusion breadth), while exploring innovation pathways and development challenges within the converged media environment.

Chapter Four: Analysis of Papers Published in China's Scientific Journals Based on International Databases, employs bibliometric methods to quantitatively analyze the international academic competitiveness and disciplinary strengths of China's SCI-indexed journals using papers from China's scientific journals indexed in the Web of Science (SCI) as its sample. The analysis spans three dimensions: disciplinary distribution, institutional contributions (universities/research institutes/enterprises), and academic impact (*e.g.*, citations per paper, proportion of highly cited papers).

Chapter Five: Analysis of Papers Published in China's Scientific Journals Based on Domestic Databases, conducts a panoramic scan of papers published in China's scientific journals drawing on Chinese databases including CNKI and Wanfang Data Co. Ltd. It examines disciplinary distribution patterns, regional output disparities, contributions from core institutions, intensity of funding project support, depth of international collaboration (proportion of papers with international authors/institutional co-authorship), and academic impact metrics (citation indicators, downloads). Cross-analysis of multiple

indicators reveals the academic ecosystem and the quality of development of domestic scientific journals.

The members of the compilation working group of this book come from Science Press, Beijing Zhongke Journal Publishing, Science China Press, KeAi Publishing, CNKI, National Science Library CAS, China Periodicals Association, Chinese Medical Journals Publishing House, Chinese Laser Press, Chinese Anti-Cancer Association, Society of China University Journals, Chinese Association of Automation, Science and Technology Review Press, Hohai University, Journal Editorial Department of Beijing Forestry University, Shandong University Scientific Journals Press, Central South University Press, Journal Center of China University of Geosciences (Beijing), and Service Center for Societies of CAST.

The compilation working group has adhered to the principles of fairness and objectivity, with the strong support of numerous experts and scholars from the Expert Committee and the Compilation Committee. Our team has collected data, selected cases, searched for relevant literature, analyzed key issues, and summarized trends based on factual evidence. By meticulously examining vast amounts of data and references, we strive to comprehensively present the current development status of China's scientific journals and research papers. Furthermore, we attempt to analyze and predict the international development landscape of China's scientific journals in the context of building world-class journals. We also examine the current state, composition, and trends of talent pools supporting journal development, along with related policies and ecosystems. In addition, we assess the opportunities and challenges faced by the innovative development of China's scientific journals and explore China-specific strategies for building world-class scientific journals. Here, we would like to express our sincere gratitude to all the experts, scholars, and industry colleagues who have contributed their hard work to the compilation and publication of this book. We also extend our heartfelt thanks to all the 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
November 2023

Contents

Chapter 1

General Information of China's STM Journals

Peiyi LIU, Yingzhi ZHOU and Zhi WANG

Abstract

General Features of China's STM Journals

Based on the data from the *National Journal Annual Inspection Report 2022* by the National Press & Publication Administration (NPPA), a total of 5163 Scientific, Technical, and Medical (STM) journals were published in China at the end of 2022. The report notes that the general features of the journals are: (A) The distribution of STM journals across different regions shows significant disparities. The top five areas that published more than 200 journals are ranked by publication volumes as follows: Beijing (1688 journals, occupying 32.69%), Shanghai (355 journals, 6.88%), Jiangsu (267 journals, 5.17%), Hubei (222 journals, 4.30%), and Sichuan (216 journals, 4.18%). (B) In terms of publication cycle, bi-monthly journals (2028 journals, 39.28%) and monthly journals (1829 journals, 35.43%) are the majority, accounting for almost 75% of the total volume. (C) In terms of language, Chinese-language STM journals take up the major part. (4556 journals, 88.24%), and the number of English-language journals is 434 (occupying 8.41% of the total). There are 173 Chinese-English journals (3.35%). (D) In terms of discipline, there are 1573 journals (30.47%) in basic science, 2272 journals (44.01%) in technology & science, 1161 journals (22.49%) in medicine & health, and 157 Journals (3.04%) in general science. (E) The overall pricing of China's STM journals is relatively low, especially for Chinese-language journals, which have an average price below 40 yuan, while the average price of English STM journals is 112.13 yuan, with a median value of 80.00 yuan.

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Distribution of Supervising, Sponsoring, and Publishing Organizations

The supervising, sponsoring, and publishing organizations.[1] Many of China's STM journals were somewhat scattered. (A) There were 1339 supervising organizations, each supervising 3.86 journals on average. Among them, 878 supervising organizations only manage one journal each (accounting for 65.57%). There were merely 76 supervising organizations (5.68%) that manage over 10 journals each. (B) Based on the statistics of the first sponsoring organizations, there were 3218 sponsoring organizations, each sponsoring 1.60 journals on average. There were 2482 sponsoring organizations that hosted only one journal each (77.13%). (C) There were 4440 publishing organizations, each publishing 1.16 journals on average. Four thousand two hundred fifty-six organizations only published one journal each (95.86%). 3439 (77.45%) publishing organizations were editorial offices with only one journal, while only 10 publishing organizations published over 10 journals each.

STM Journal Personnel

China's STM journal industry had a total of 36 974 personnel. In terms of employment type, the majority were permanent staff, accounting for 64.57%; in terms of functional distribution, the majority were editorial staff (60.91%); and for educational background, there were primarily bachelor's and master's degree holders, jointly accounting for 75.11%; in terms of professional titles, 71.24% hold mid-level or senior titles, with senior-level titles representing 42.99% of the total workforce.

STM Journal Publishing Operation

In terms of funding support, a small number of STM journals received funding from their supervising organizations, and nearly half of STM journals received funding from their sponsoring organizations, with most of these organizations providing support of less than 250 000 yuan per year. Only 4.90% of STM journals received national-level special funds, and the support for each journal ranged from 400 000 yuan to 500 000 yuan. The percentage of STM journals that received support from industry special funds was 1.44% with the support per journal not exceeding 300 000 yuan. The share of STM journals receiving support from provincial and municipal special funds was 3.05% with the support per journal below 200 000 yuan.

In terms of STM journal operations, nearly half of STM journals had a circulation of less than 1000 copies. 50.71% of STM journals were distributed *via* "postal distribution & self-distribution", and 57.47% of STM journals had annual distribution revenue of less than 100 000 yuan. 37.32% of STM journals generated advertising revenue, with annual advertising income mostly below 300 000 yuan. 24.81% of STM journals had an annual copyright revenue of less than 50 000 yuan, and 1.71% of STM journals had income from overseas publications. Only 14.11% of STM journals had an annual income of less than 400 000 yuan from project activities. In terms of total revenue, 52.11% of journals had

[1]According to the "Regulations for Administration of Periodical Publication" issued by China's National Press and Publication Administration in 2005, periodicals shall be published by publishing units established in accordance with laws. To establish periodicals or periodical publishing units, the requirement of possessing an administration or sponsor which is recognized by the National Press and Publication Administration should be met.

annual revenue of less than 700 000 yuan, while 35.77% had annual revenue of 1 million yuan and above. In terms of total expenditure, 49.71% of journals had an annual expenditure of less than 700 000 yuan, while 35.40% had an annual total expenditure of 1 million yuan or more.

The Changes in the Number of China's STM Journals from 2018 to 2022

The data from the National Journal Annual Inspection Report by NPPA indicate a consistent upward trajectory in the number of China's STM journals from 2018 to 2022. Available statistics indicate that the total number of STM journals in China was 4973 in 2018 and increased to 5163 in 2022, representing a growth rate of 3.82%. The number of English-language STM journals in China exhibited a rapid growth trend during the same period, rising from 333 in 2018 to 434 in 2022, an increase of 101 journals, with an average annual growth rate of 6.85%.

Furthermore, an analysis of NPPA data reveals that 115 new STM journals (with newly approved CN serial numbers) had been launched in China between 2018 and 2022. However, it should be noted that these figures represent incomplete statistics. The vast majority of these new journals were in the English language, with a total of 99 (86.09%) launched over the five-year period. The year 2021 saw the highest number of new STM journals established, 44, while 12 new ones were established in 2022. In contrast, a total of 41 STM journals were deregistered during the same period, with the peak occurring in 2020 (19 deregistrations). In both 2021 and 2022, ten journals were deregistered, with the majority of these being Chinese-language STM journals.

1.1 Basic Facts of Journals

The analysis in this book is based on data from the 2022 National Journal Annual Inspection (2022 Annual Inspection hereafter). The data were sorted according to the Chinese Library Classification Code (CLC) of China's publications, with the standardized serial CN number. Relevant data on China's STM journals were taken (5111 items, including popular science journals), taking into account the information on newly approved journals by the state, title-changed journals during 2018–2022, and revoked journals during 2016–2022. A comparison was made with the data in China's STM Journal Directory, as outlined in the Blue Book on China's Scientific Journal Development, published between 2017 and 2022. The statistical results showed that the total number of China's STM journals was 5163 by the end of 2022.[2]

1.1.1 The Changes in the Number of STM China's Journals from 2018 to 2022

Based on the annual inspection data of national periodicals over the past five years (2018–2022), the number of China's STM journals has shown a steady growth trend.

[2]The statistics of China's STM journals in this book do not include data on journals that did not participate in the 2022 annual inspection, nor the data on journals in China's Hong Kong SAR, Macao SAR and Taiwan regions.

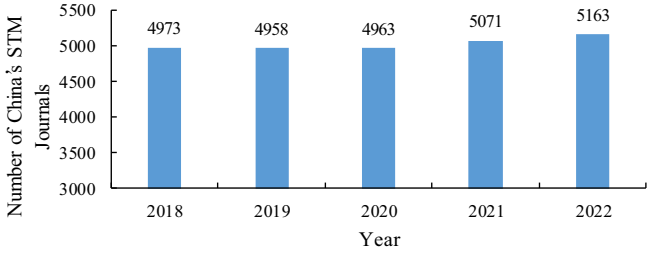

FIG. 1.1 – Changes in the total number of China's STM journals (2018–2022).

According to available statistics, the number of STM journals in China was 4973 in 2018 and increased to 5163 in 2022, representing a growth rate of 3.82% (figure 1.1[3]).

According to the annual inspection data of national journals over the past five years (2018–2022), the total number of English-language STM journals in China has shown a rapid growth trend. According to incomplete statistics (figure 1.2), the total number of English-language STM journals in China increased from 333 in 2018 to 434 in 2022, with an average annual growth rate of 6.85%. Among these, a small portion of journals transitioned into English-language STM journals by changing their publication language, while retaining their original CN serial numbers.

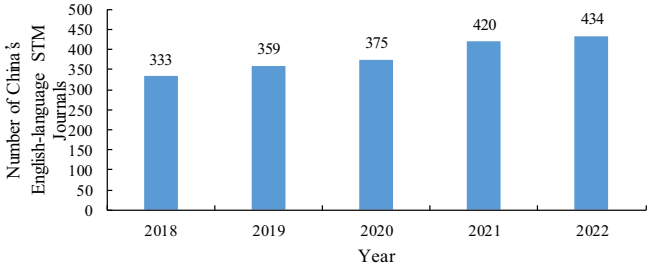

FIG. 1.2 – Changes in the number of China's English-language STM journals (2018–2022).

Based on available statistics from the NPPA, China has launched 115 new STM journals (with newly approved CN numbers) in the past five years (2018–2022). As shown in table 1.1, most of these new journals were in English, with a total of 99 (86.09%) established over the five-year period. The year 2021 saw the highest number of newly established scientific journals, reaching 44. At the same time, only 12 new STM journals were established in 2022, including *BioDesign Research*, *Blood Science*, *Rheumatology & Autoimmunity*, *Cancer Pathogenesis and Therapy*, *Medicine Plus*, *UroPrecision*, *Life Metabolism*, *npj Flexible Electronics*, *mLife*, *Chinese Medical Journal Pulmonary and Critical Care Medicine*, *CAAI Artificial Intelligence Research*, and *Security and Safety*, all in the English language.

[3]The statistical data for 2021 and 2022 include a number of comprehensive scientific journals.

According to incomplete statistics from NPPA, China deregistered a total of 41 scientific journals over the recent five-year period (2018–2022). As shown in table 1.1, the year 2020 saw the highest number of deregistered STM journals, reaching 19. The number of deregistered scientific journals stood at 10 in both 2021 and 2022. The vast majority of deregistered journals were in Chinese, with only two English journals discontinued: *Nanotechnology and Environment* (original CN: 31-2090/X) and *Fungal Diversity* (original CN: 10-1636/Q).

Tab. 1.1 – Establishment and deregistration of China's STM journals (2018–2022) (Unit: no. of journals).

Year	Newly Established Journals				Newly Cancelled Journals		
	Chinese	English	Chinese-English	Total	Chinese	English	Total
2018	7	7	1	15	0	0	0
2019	3	24	1	28	2	0	2
2020	1	15	0	16	18	1	19
2021	3	41	0	44	10	0	10
2022	0	12	0	12	9	1	10
Total	14	99	2	115	39	2	41

1.1.2 Regional Distribution of Publications

The numbers of STM journals published in different regions across China are unevenly distributed. Analysis of 5163 China's STM journals in 2022 shows: Beijing ranked first (1688 journals, 32.69% of all journals); Shanghai (355 journals, 6.88%), Jiangsu (267 journals, 5.17%), Hubei (222 journals, 4.30%), and Sichuan (216 journals, 4.18%). All five regions published over 200 STM journals each; 12 regions published 100–200 STM journals each; and nine regions published 50–100 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. For the detailed distribution of journal numbers, please refer to table 1.2.

From 2018 to 2022, most regions in China showed consistent growth in the number of STM journals, with Beijing exhibiting the most pronounced growth. Incomplete statistics indicate that Beijing added a total of 71 STM journals during this period, including 22 newly added comprehensive journals[4] in the statistical scope. This represents a growth rate of 4.39%. Jiangsu and Zhejiang provinces each saw an increase of 17 scientific journals during the same period (including 11 newly added comprehensive journals each), with growth rates of 6.80% and 14.91%, respectively (table 1.3). The number of journals in Gansu, Ningxia, and Xizang Autonomous Regions remained constant throughout the period under review.

[4]The 2021 and 2022 National Journal Annual Inspection data include comprehensive journals.

Tab. 1.2 – Distribution of China's STM journals in 2022 (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	27	10	199	496	770	142	35	6	3	1688
2	Shanghai	1	2	55	168	118	8	3	0	0	355
3	Jiangsu	1	1	49	136	66	10	2	1	1	267
4	Hubei	3	1	21	99	78	16	4	0	0	222
5	Sichuan	0	0	43	88	75	5	4	1	0	216
6	Guangdong	0	1	24	79	64	18	5	1	0	192
7	Liaoning	1	0	15	90	67	5	4	0	0	182
8	Heilongjiang	2	0	25	68	56	9	4	1	0	165
9	Shaanxi	0	1	22	73	53	9	2	1	0	161
10	Tianjin	1	1	15	57	56	11	1	0	0	142
11	Shandong	0	0	29	62	38	5	3	0	0	137
12	Hunan	0	0	24	63	39	6	3	1	0	136
13	Zhejiang	0	0	34	55	38	3	1	0	0	131
14	Henan	2	0	21	54	35	8	5	2	0	127
15	Hebei	0	1	17	39	32	12	7	1	0	109
16	Anhui	1	0	18	53	28	4	1	0	0	105
17	Jilin	0	0	19	38	29	9	7	1	0	103
18	Shanxi	0	0	15	34	26	11	4	0	0	90
19	Chongqing	0	0	5	29	28	13	3	2	0	80
20	Guangxi	2	0	15	29	26	3	0	3	0	78
21	Fujian	0	3	20	33	20	0	0	0	0	76
22	Jiangxi	0	0	15	34	16	7	1	0	0	73
23	Gansu	0	0	8	42	12	4	0	0	0	66
24	Xijiang	1	5	22	25	6	0	0	0	0	59
25	Yunnan	0	0	7	25	16	3	4	0	0	55
26	Inner Mongolia	0	2	6	23	15	2	1	2	0	51
27	Guizhou	0	0	5	22	10	1	0	0	0	38
28	Qinhai	0	0	13	5	1	0	0	0	0	19

Tab. 1.2 – (continued).

29	Hainan	0	0	4	0	5	3	1	0	0	13
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	30	775	2028	1829	327	105	23	4	5163

Note: Ranked by the number of published journals.

Based on the statistics of reporting units in the national journal annual inspection, the number of XPCC was counted separately.

Tab. 1.3 – Changes in the distribution of STM journals in different regions of China (2018–2022).

Serial no.	Region	No. of journals					Growth rate /%	Growth No.	Yearly Avg. growth rate/%
		2018	2019	2020	2021	2022			
1	Beijing	1617	1625	1629	1671	1688	4.39	71	1.08
2	Shanghai	360	355	355	357	355	–1.39	–5	–0.35
3	Jiangsu	250	254	254	258	267	6.80	17	1.66
4	Hubei	208	208	208	214	222	6.73	14	1.64
5	Sichuan	208	208	208	212	216	3.85	8	0.95
6	Guangdong	183	179	180	188	192	4.92	9	1.21
7	Heilongjiang	179	177	177	181	182	1.68	3	0.42
8	Heilongjiang	163	162	163	163	165	1.23	2	0.31
9	Shaanxi	164	162	163	161	161	–1.83	–3	–0.46
10	Tianjin	140	141	137	140	142	1.43	2	0.36
11	Shandong	129	130	130	132	137	6.20	8	1.52
12	Hunan	131	131	130	132	136	3.82	5	0.94
13	Zhejiang	114	117	119	125	131	14.91	17	3.54
14	Henan	114	113	114	119	127	11.40	13	2.74
15	Hebei	108	106	105	109	109	0.93	1	0.23
16	Anhui	94	86	86	94	105	11.70	11	2.81
17	Jilin	101	103	104	103	103	1.98	2	0.49
18	Shanxi	92	91	91	89	90	–2.17	–2	–0.55
19	Chongqing	79	79	80	79	80	1.27	1	0.31
20	Guangxi	77	76	76	75	78	1.30	1	0.32
21	Fujian	73	72	71	75	76	4.11	3	1.01
22	Jiangxi	70	70	69	71	73	4.29	3	1.05
23	Gansu	66	65	66	67	66	0.00	0	0.00
24	Xinjiang	55	54	55	58	59	7.27	4	1.77
25	Yunnan	51	51	50	52	55	7.84	4	1.91
26	Inner Mongolia	52	51	51	51	51	–1.92	–1	–0.48
27	Guizhou	35	35	35	36	38	8.57	3	2.08
28	Qinghai	19	18	18	19	19	0.00	0	0.00

Tab. 1.3 – (continued).

29	Hainan	15	14	13	13	13	–13.33	–2	–3.51
30	Ningxia	11	11	11	11	11	0.00	0	0.00
31	Xizang	9	8	9	9	9	0.00	0	0.00
32	XPCC	6	6	6	7	7	16.67	1	3.93
Total		4973	4958	4963	5071	5163	3.82	190	0.94

Note: Ranked by the number of published journals in each region in 2022.

1.1.3 Distribution by Publication Cycle

In terms of publication cycle, most of China's STM journals are published monthly or bi-monthly. Statistics of the 5163 STM journals published in 2022 show that (tables 1.2 and 1.4), the top three types of journals, sorted by publication cycle and ranked by the number of journals, were: bi-monthly (2028 journals, 39.28%), monthly (1829 journals, 35.43%), and quarterly (775 journals, 15.01%). Among them, bi-monthly journals and monthly journals together accounted for 74.71% of all journals (3857 journals). Beijing had the most significant number of monthly journals (770 journals), accounting for 42.10% of all monthly STM journals in China. When compared in terms of publication cycle, three regions—Beijing, Hainan, and Ningxia—had the highest proportions of monthly journals; Qinghai and Xizang led in quarterly journals, and other areas had bi-monthly journals as the primary type. A comparative analysis of the publication cycles from 2018 to 2022 reveals an increase in the number of annual, bi-annual, quarterly, and bi-monthly journals, with an increase of 13, 4, 49, and 120 journals, respectively. The number of journals with other publication cycles remained steady.

1.1.4 Distribution by Language and Discipline

Chinese language journals account for the majority of China's STM journals. Among the 5163 STM journals in 2022, there were 4556 Chinese language journals (88.24%, among which 4510 journals were in Mandarin, 20 in Uyghur, nine in Mongolian, seven in Kazak, five in Tibetan language, two in Korean language, two in Sino-Tibetan language, one in Sino-Myanmar language), 434 English language journals (8.41%), and 173 Chinese-English journals (3.35%) (table 1.5).

Mandarin STM journals mainly were in "industrial technology general introduction" (1714 journals, 38.00%), "medicine, health and comprehensive medicine & health" (996 journals, 22.08%), "agriculture, forestry, and comprehensive agricultural science" (488 journals, 10.82%), "natural science general introduction" (416 journals, 9.22%). STM journals in ethnic minority languages were mostly in "agriculture, forestry, and comprehensive agricultural science" (15 journals, 32.61%), "medicine, health, and comprehensive medicine & health" (13 journals, 28.26%), and "natural science general introduction" (11 journals, 23.91%). English language STM journals were mostly in "industrial technology general introduction" (121 journals, 27.88%), "medicine, health, comprehensive medicine & health" (100 journals, 23.04%), and "mathematical & physical science and chemistry" (65 journals, 14.98%) (table 1.5).

Based on the distribution by the discipline of the 5163 STM journals in China, there were 1573 journals in "basic science" (30.47%), including 467 journals in "natural science general introduction", 211 journals in "mathematical & physical science and chemistry", 248 journals in "astronomy and geosciences", 110 journals in "biological science", and 537 journals in "agriculture, forestry and comprehensive agricultural science"; 2272 journals in "technical science" (44.01%), including 1878 journals in "industrial technology general introduction", 223 journals in "transportation", 77 journals in "aeronautics and spaceship", 94 journals in "environmental science and safety science"; 1161 journals in "medicine & health" (22.49%) (table 1.5); 157 journals in "comprehensive science" (3.04%).

Tab. 1.4 – Distribution of publication cycles of China's STM journals (2018–2022).

Frequency	2018		2019		2020		2021		2022		Growth rate %
	No. of journals	%	No. of journals	%	No. of journals	%	No. of journals	%	No. of journals	%	
Bi-monthly	1908	38.37	1924	38.81	1941	39.11	1970	38.85	2028	39.28	6.29
Monthly	1821	36.62	1840	37.11	1804	36.35	1823	35.95	1829	35.43	0.44
Quarterly	726	14.60	711	14.34	727	14.65	757	14.93	775	15.01	6.75
Semi-monthly	326	6.56	306	6.17	319	6.43	320	6.31	327	6.33	0.31
Ten-day	109	2.19	104	2.10	99	1.99	106	2.09	105	2.03	–3.67
Yearly	29	0.58	30	0.61	30	0.60	44	0.87	42	0.81	44.83
Weekly	31	0.62	22	0.44	24	0.48	25	0.49	30	0.58	–3.23
Semi-yearly	19	0.38	17	0.34	16	0.32	23	0.45	23	0.45	21.05
Semi-weekly	4	0.08	4	0.08	3	0.06	3	0.06	4	0.08	0.00
Total	4973	100.00	4958	100.00	4963	100.00	5071	100.00	5163	100.00	3.82

Tab. 1.5 – Distribution of China's STM journals (2018–2022) (Unit: no. of journals).

Category	Discipline	Year	Mandarin	English	Chinese-English	Ethnic minority language[a]	Total
Basic Science	N Natural Science General Intro	2018	435	21	9	10	475
		2019	420	20	11	12	463
		2020	419	20	12	11	462
		2021	416	23	16	11	466
		2022	416	23	17	11	467
	O Mathematical & Physical Science and Chemistry	2018	138	53	11	0	202
		2019	137	55	11	0	203
		2020	135	58	12	0	205
		2021	134	65	12	0	211
		2022	133	65	13	0	211
	P Astronomy, Geosciences	2018	203	37	5	0	245
		2019	198	40	10	0	248
		2020	200	40	9	0	249
		2021	197	40	11	0	248
		2022	197	40	11	0	248
	Q Biological Science	2018	68	29	7	0	104
		2019	67	32	9	0	108
		2020	67	32	9	0	108
		2021	66	36	7	0	109
		2022	64	37	9	0	110
	S Agriculture, Forestry, Comprehensive Agricultural Science	2018	494	14	12	14	534
		2019	485	17	18	14	534
		2020	487	17	15	15	534
		2021	487	21	13	15	536
		2022	488	22	12	15	537
Technical Science	T Industrial Technology General Intro	2018	1763	98	21	1	1883
		2019	1732	105	37	1	1875
		2020	1723	108	39	1	1871
		2021	1715	118	41	2	1876
		2022	1714	121	41	2	1878

Tab. 1.5 – (continued).

	U Transportation	2018	211	5	6	0	222
		2019	208	6	11	0	225
		2020	205	6	11	0	222
		2021	208	8	9	0	225
		2022	206	8	9	0	223
	V Aeronautics, Spaceship	2018	70	3	2	0	75
		2019	68	4	3	0	75
		2020	68	5	3	0	76
		2021	67	6	3	0	76
		2022	68	6	3	0	77
	X Environmental Science, Safety	2018	79	7	4	3	92
	Science	2019	79	8	3	2	92
		2020	77	8	3	2	90
		2021	77	11	4	2	94
		2022	77	11	4	2	94
Medicine	R Medicine, Health, Comprehensive	2018	1003	66	44	13	1126
& Health	Medicine & Health	2019	993	72	57	13	1135
		2020	981	81	71	13	1146
		2021	995	92	52	13	1152
		2022	996	100	52	13	1161
Comprehensive	Z Comprehensive Science	2018	13	0	0	1	14
Science		2019	–	–	–	–	–
		2020	–	–	–	–	–
		2021	74	0	1	3	78
		2022	151	1	2	3	157

Tab. 1.5 – (continued).

Category	Discipline	Year	Mandarin	English	Chinese-English	Ethnic minority language[a]	Total
Total		2018	4477	333	121	42	4973
		2019	4387	359	170	42	4958
		2020	4362	375	184	42	4963
		2021	4436	420	169	46	5071[b]
		2022	4510	434	173	46	5163

Note: a. "Ethnic minority language" mainly refers to Uyghur, Mongolian, Kazak, Tibetan, Korean, Sino-Tibetan, and Sino-Myanmar.
b. From 2021, the *Blue book* has included the data of comprehensive scientific journals in the annual inspection of national journals in its statistical scope.

Between 2018 and 2022, China experienced the most significant growth in the number of medical and healthcare journals, followed by basic science journals. Incomplete statistics indicate an increase of 35 medical and healthcare journals and 13 basic science journals. Engineering journals showed no substantial development. The category of "mathematical, physical, and chemical sciences" saw an increase of nine journals, while the "biological sciences" category grew by six. The "astronomy and earth sciences" category expanded by three, and the "agriculture, forestry, and comprehensive agricultural sciences" category also added three journals. The "aerospace" category increased by two, and the "environmental and safety sciences" category saw a rise of two journals.

1.1.5 Distribution by Pricing

The pricing of Chinese language STM journals in China is relatively low, with most issues priced below 40 yuan, while the pricing of English language journals is significantly higher. Among the 5163 STM journals in China, 5052 journals provided data on pricing. The average pricing for the 5052 journals was 33.09 yuan per issue, the median pricing was 20 yuan per issue, the lowest pricing was 1.6 yuan per issue (only one journal), and the highest was 1155 yuan per issue (1 journal, *Automotive Innovation Engineering*). The dataset includes 162 pricing tiers, with journals priced between 10 and 20 yuan being the most prevalent at 1851 journals, accounting for 36.64% of the total. One thousand one hundred seventy-seven journals were priced in the 20–30 yuan range, representing 23.30% of the total (table 1.6). The average price of Mandarin STM journals was 26.43 yuan per issue, and the median price was 18 yuan. The pricing of STM journals in ethnic minority languages was lower, with an average of 8.50 yuan per issue and a median of 8.00 yuan per issue. The average price of Chinese-English language STM journals was 32.04 yuan per issue, with a median of 25 yuan. The pricing of English language STM journals was higher, with an average of 112.13 yuan per issue and a median of 80 yuan per issue.

Tab. 1.6 – Pricing distribution of China's STM journals in 2022.

Price/Yuan	No. of journals	% of Total	Price/Yuan	No. of journals	% of Total
<10	503	9.96	80∼	93	1.84
10∼	1851	36.64	90∼	23	0.46
20∼	1177	23.30	100∼	139	2.75
30∼	541	10.71	150∼	46	0.91
40∼	211	4.18	200∼	74	1.46
50∼	212	4.20	300∼	35	0.69
60∼	119	2.36	500∼	8	0.16
70∼	20	0.40	Total	5052	100.00

Note: Among the 5111 data items provided for the 2022 annual inspection, 5052 journals provided pricing information; 59 journals did not provide pricing information.

1.1.6 Distribution by Supervising, Sponsoring, and Publishing Organizations

The supervising, sponsoring, and publishing organizations of China's STM journals are scattered, with most publishing organizations being the editorial offices of a single journal, and no significant changes have occurred from 2018 to 2022 (table 1.7). According to statistics, in 2022, the 5163 STM journals in China had 1339 supervising organizations in total, which means each organization managed 3.86 journals on average. Eight hundred seventy-eight organizations (65.57% of all) only managed one journal each; 205 organizations (15.31%) managed two journals each; and 181 organizations (13.52%) managed three to nine journals each. Seventy-five organizations (5.68%) managed over 10 journals each. The top 10 supervising organizations of STM journals, ranked by the number of journals, were: CAST (490 journals), the Ministry of Education (459 journals), CAS (300 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 (40 journals).

Based on the statistics from the first sponsoring organization, in 2022, there were 5163 STM journals in China, with 3218 sponsoring organizations, each sponsoring an average of 1.60 journals. Two thousand four hundred eighty-two organizations (77.13% of all) hosted only one journal each, 410 organizations (12.74%) hosted two journals each, and 291 organizations (9.04%) hosted three to nine journals. Thirty-five organizations (1.09%)

Tab. 1.7 – Statistics on the supervising, sponsoring and publishing organizations (2018–2022) (Unit: no. of journals).

		2018	2019	2020	2021	2022
Supervising organizations	Total	1276	1291	1311	1325	1339
	No. of organizations supervising one journal	821	861	885	871	878
	No. of journals supervising on average	3.9	3.84	3.79	3.83	3.86
Sponsoring organizations	Total	3117	3080	3140	3153	3218
	No. of organizations sponsoring one journal	2401	2365	2449	2429	2482
	No. of journals sponsoring on average	1.6	1.61	1.58	1.61	1.60
Publishing organizations	Total	–	4288	4261	4354	4440
	No. of organizations publishing one journal	–	4108	4069	4171	4256
	Standalone editorial office as publishing entity	–	3269	3282	3421	3439
	No. of journals published on average	–	1.16	1.16	1.17	1.16

hosted 10 (and above) journals each. The top 10 sponsoring organizations of STM journals, ranked by the number of journals, were: Chinese Medical Association (CMA) (153 journals), Chinese Preventive Medicine Association (CPMA) (34 journals), Chinese Medical Doctor Association (CMDA) (29 journals), Zhejiang University (25 journals), Tsinghua University (21 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 Co. Ltd. (19 journals), China Science Publishing & Media Ltd. (19 journals), Higher Education Press Limited Company (19 journals).

The 5163 STM journals in China were published by 4440 organizations, averaging 1.16 journals per organization. Three thousand four hundred thirty-nine organizations (95.86% of all) published only one journal each. 3439 publishing organizations were the editorial office of a single journal, accounting for 77.45% of the total. One hundred six organizations (2.39%) published two journals each, and 68 organizations (1.53%) published three to nine journals. 10 organizations (0.23%) published 10 (and above) journals each. The top 10 publishing organizations, ranked by the number of journals published, were: China Science Publishing & Media Ltd. (Science Press, 145 journals), Chinese Medical Association Publishing House Co. Ltd. (144 journals), Tsinghua University Publishing House Co. Ltd. (22 journals), Higher Education Press Limited Company (21 journals), Beijing Promonion Publishing Co. Ltd. (20 journals), Zhejiang University Publishing House Co., Ltd. (19 journals), Science China Press Co., Ltd. (18 journals), China Railway Publishing Housing Co., Ltd. (13 journals), Boyuan Publishing Co., Ltd., Central Iron and Steel Research Institute (12 journals), and China InfoCom Media Group Co., Ltd. (10 journals).

1.2 Journal-Running Conditions and Human Resources

1.2.1 Journal Operation Location

China's STM journals have stable premises for operations. Among the 5111 STM journals that participated in the 2022 journal annual inspection (table 1.8), excluding invalid data, a total of 5071 journals reported data on office space and premise ownership, including some that maintained two or more types of office facilities. There were 3827 journals (75.47% of all) that used premises provided by parent institutions, predominantly in 25–75 m^2 ranges (exclusive). Five hundred ninety-three journals (11.69%) owned their offices, mostly within 25–75 m^2. Six hundred ninety-seven journals (13.74%) leased their office for operations, primarily 25–75 m^2).

1.2.2 Human Resources

1.2.2.1 Analysis of China's STM Journal Personnel

Among the 5111 STM journals that participated in the 2022 annual journal inspection, 5013 journals reported personnel information. Statistical findings (table 1.9) reveal that

Tab. 1.8 – Operation area of China's STM journals 2022.

Office space (m^2)	Provided by supervising authority		Self-owned		Leased	
	No. of journals	%	No. of journals	%	No. of journals	%
<25	364	9.51	76	12.82	30	4.3
25 ~	1095	28.61	115	19.39	122	17.50
50 ~	994	25.97	114	19.22	123	17.65
75 ~	416	10.87	71	11.97	62	8.90
100 ~	464	12.12	94	15.85	94	13.49
125 ~	89	2.33	11	1.85	37	5.31
150 ~	145	3.79	22	3.71	64	9.18
200 ~	152	3.97	35	5.90	86	12.34
300 ~	64	1.67	22	3.71	43	6.17
500 ~	44	1.15	33	5.56	36	5.16
Total	3827	100.00	593	100.00	697	100.00

Note: Among the 5111 data points provided for the 2022 annual inspection, 40 were invalid; hence, there were 5071 valid data, including journals that owned two or more types of office premises. Journals had an office space below 25 m^2, excluding data reported as "0".

China's STM journal workforce totaled 36 974 personnel. Two thousand two hundred fifty-six journals had four to seven staff members per journal, accounting for 45.00% of all the journals; 947 journals (18.89%) had 10 (and above) staff members; and 63 journals (1.26%) had 30 or more staff members.

1.2.2.2 China's STM Journal Personnel Analysis: Permanent and Non-Permanent Staff

The majority of China's STM journal personnel are permanent staff. According to the 2022 annual inspection data, there were 23 873 (64.57%) permanent staff and 13 101 non-permanent (35.43%) staff working for China's STM journals. The statistics (table 1.10) show that a total of 10 regions employed over 1000 professionals, with Beijing having the largest workforce at 12 020 people (32.51% of the national total). Among the 32 provincial-level regions and XPCC, 27 regions reported over 60% permanent staff, peaking at 88.21%. Guangxi and Hainan fell below 50%, with the lowest at 45.63%. Regarding journal workforce composition, 2018 journals (40.26%) employed exclusively permanent staff, and 339 journals (6.76%) relied solely on contracted personnel.

1.2.2.3 Analysis of Personnel Composition of China's STM Journals

The workforce of China's STM journal is predominantly composed of editorial and publishing staff. According to the annual inspection data, STM journal personnel consist of acquisition editors, new media specialists, administrative personnel, advertisement staff, distribution team, and other supporting roles. Based on statistics (table 1.11), editorial

Tab. 1.9 – Distribution of China's STM journal personnel in journals with various publishing cycles 2022 (Unit: no. of journals).

No. of staff per journal	Publication cycle									Total
	Yearly	Semi-yearly	Quarterly	Bi-monthly	Monthly	Semi-monthly	Ten-day	Weekly	Semi-weekly	
1 ∼	6	9	167	264	110	5	2	1	0	564
4 ∼	17	11	429	1105	630	51	12	1	0	2256
7 ∼	9	5	97	459	580	77	14	5	0	1246
10 ∼	6	3	22	112	263	81	25	4	0	516
13 ∼	1	0	9	24	85	40	13	5	0	177
16 ∼	0	0	3	7	39	23	10	0	0	82
19 ∼	0	1	1	7	23	9	8	1	0	50
22 ∼	1	1	1	7	24	13	11	1	0	59
30 ∼	0	0	1	7	13	15	7	2	0	45
40 ∼	0	0	0	0	4	1	0	0	0	5
50 ∼	0	0	1	1	1	4	0	3	0	10
70 ∼	0	0	0	0	1	0	1	0	1	3
Total	40	30	731	1993	1773	319	103	23	1	5013

Note: Among the 5111 data items provided for the 2022 annual inspection, there were 98 unreported items; hence, there were 5013 valid data in total.

Tab. 1.10 – Personnel analysis of China's STM journals in different regions, 2022.

Serial no.	Region	Total personnel	Permanent staff		Non-permanent staff	
			Permanent staff	%	Non-permanent staff	%
1	Beijing	12 020	6419	53.40	5601	46.60
2	Shanghai	2602	1761	67.68	841	32.32
3	Jiangsu	1837	1350	73.49	487	26.51
4	Guangdong	1554	820	52.77	734	47.23
5	Hubei	1497	1015	67.80	482	32.20
6	Sichuan	1441	1002	69.54	439	30.46
7	Shaanxi	1222	854	69.89	368	30.11
8	Liaoning	1168	919	78.68	249	21.32
9	Heilongjiang	1161	888	76.49	273	23.51
10	Henan	1107	861	77.78	246	22.22
11	Tianjin	950	838	88.21	112	11.79
12	Hunan	906	590	65.12	316	34.88
13	Shandong	899	738	82.09	161	17.91
14	Hebei	851	541	63.57	310	36.43
15	Chongqing	846	506	59.81	340	40.19
16	Guangxi	824	376	45.63	448	54.37
17	Shanxi	806	568	70.47	238	29.53
18	Anhui	775	518	66.84	257	33.16
19	Zhejiang	775	547	70.58	228	29.42
20	Jilin	683	494	72.33	189	27.67
21	Jiangxi	517	392	75.82	125	24.18
22	Fujian	469	353	75.27	116	24.73
23	Gansu	417	306	73.38	111	26.62
24	Yunnan	363	260	71.63	103	28.37
25	Inner Mongolia	360	250	69.44	110	30.56
26	Xinjiang	299	250	83.61	49	16.39
27	Guizhou	249	189	75.90	60	24.10
28	Hainan	116	57	49.14	59	50.86
29	Qinghai	100	77	77.00	23	23.00
30	Ningxia	61	47	77.05	14	22.95
31	Xizang	57	50	87.72	7	12.28
32	XPCC	42	37	88.10	5	11.90
Total		36 974	23 873	64.57	13 101	35.43

Note: Among the 5111 data items collected in 2022, 98 items were unreported; hence, there were 5013 valid data left.

staff normally are responsible for the topic selection, paper commissioning and processing, accounting for 60.91% of all STM journal workforce. Administrative staff, primarily responsible for the daily management of editorial offices, accounted for 11.77%. The distribution team, mainly engaged in marketing and promotion, constituted 7.47%. New

media specialists focus on academic content outreach, representing 6.09% while advertising staff, dedicated to advertising operations, made up 5.21%. Currently, these two types account for a relatively small proportion of the total personnel. Among journal editorial teams, two to five editorial staff members are the most common size, covering 3608 STM journals (71.97%).

1.2.2.4 Academic Background Analysis of China's STM Journal Personnel

The majority of China's Chinese language STM journal personnel have an undergraduate degree. The majority of English language STM journal personnel have master's degrees. Based on statistics (table 1.12), most of China's STM journal personnel have bachelor's and master's degrees, with a total number of 27 770 persons, accounting for 75.11% of all personnel. Mandarin language journals had the most significant number of personnel, with 33 393 persons, accounting for 90.31% of all staff. Among Chinese-language journal personnel, bachelor's degree holders form the largest educational cohort (14 990 individuals, 44.89%). In contrast, English-language journals employ 2155 professionals, with master's degree holders constituting the highest proportion (925 individuals, 42.92%).

1.2.2.5 Analysis of Professional Titles of China's STM Journal Personnel

Among the 5111 journals that participated in the 2022 annual inspection, 5013 journals provided information on the personnel's professional titles. The statistics (table 1.13) show that 26 341 people (71.24% of all personnel) had intermediate titles and above, among whom 15 895 people (42.99%) had senior titles.

1.3 Publication Management and Content Review

Among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals provided information on publication management and content review systems. Statistics reveal that the implementation of management systems in China's STM journals is highly effective, except for the relatively low percentage of journals explicitly instituting "prioritizing social benefits" requirements (table 1.14).

(1) Regulations for STM journals on avoiding academic misconduct and protecting academic ethics. Except for 324 non-academic journals, 4177 STM journals implemented such regulations, accounting for 99.59% of 4194 journals that completed this item (565 journals did not report this item).
(2) Regulation on new media content review. Two thousand two hundred twenty journals implemented regulations on new media content review, accounting for 89.81% of 2472 journals that completed this item (2611 journals did not provide data for this item).
(3) Regulation on separating editorial operations from business operations. Four thousand nine hundred ninety-four journals separated their editorial operations from business operations, accounting for 98.25% of 5083 journals that reported this item.
(4) Regulation on prioritizing social benefits. 759 STM journals implemented such regulation, accounting for 50.33% of 1508 journals that filled in this item (3575 journals did not provide data for this item).

Tab. 1.11 – Personnel composition of China's STM journals 2022.

Personnel composition	Mandarin journal		English journal		Chi-Eng journal		Ethnic minority language journal*		Total	
	Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
Editorial	20 157	60.36	1446	67.10	766	64.15	152	65.52	22 521	60.91
New media	2005	6.00	167	7.75	76	6.37	3	1.29	2251	6.09
Administrative	3996	11.97	203	9.42	130	10.89	22	9.48	4351	11.77
Advertisement	1844	5.52	36	1.67	43	3.60	4	1.72	1927	5.21
Distribution	2560	7.67	112	5.20	72	6.03	19	8.19	2763	7.47
Others	2831	8.48	191	8.86	107	8.96	32	13.79	3161	8.55
Total	33 393	100	2155	100	1194	100	232	100	36 974	100.00

Note: Among the 5111 data items provided for the 2022 annual inspection, 98 items were not reported; hence, there were 5013 valid data left.
*Ethnic minority language journals refer to journals in languages such as Uyghur, Mongolian, Kazak, Tibetan, Korean, Sino-Tibetan, and Sino-Myanmar.

Tab. 1.12 – Academic background of China's STM journal personnel in 2022.

Academic background	Mandarin journal		English journal		Chi-Eng journal		Ethnic minority language journal*		Total	
	Persons	%	Persons	%	Persons	%	Persons	%	Persons	%
Ph.D.	4594	13.76	813	37.73	253	21.19	17	7.33	5677	15.35
Master's	10 481	31.39	925	42.92	427	35.76	44	18.97	11 877	32.12
Bachelor's	14 990	44.89	336	15.59	409	34.25	158	68.10	15 893	42.98
College degree and under	3328	9.97	81	3.76	105	8.79	13	5.60	3527	9.54
Total	33 393	100.00	2155	100.00	1194	100.00	232	100.00	36 974	100.00

Note: Among the 5111 data items provided for the 2022 annual inspection, 98 items were not reported; hence, there were 5013 valid data left.
*Ethnic minority language journals refer to journals in Uyghur, Mongolian, Kazak, Tibetan, Korean, Sino-Tibetan, and Sino-Myanmar.

Tab. 1.13 – Professional titles of China's STM journal personnel in 2022.

Professional title	No. of personnel	%
Senior	7460	20.18
Associate senior	8435	22.81
Intermediate	10 446	28.25
Junior and under	10 633	28.76
Total	36 974	100.00

Note: Among the 5111 data items provided for the 2022 annual inspection, 98 items were not reported; hence, there were 5013 valid data left.

Tab. 1.14 – Facts of China's STM journal management regulations in 2022.

Management regulations	Yes		No		Not clear	
	No. of journals	%	No. of journals	/%	No. of journals	/%
Regulation on avoiding academic misconduct and protecting academic ethics	4177	87.77	17	0.36	565	11.87
Regulation on new media content review	2220	43.67	252	4.96	2611	51.37
Regulation on separating editorial operations from business operations	4994	98.25	89	1.75	0	0.00
Regulation on prioritizing social benefits	759	14.93	749	14.74	3575	70.33

Note: *The statistics did not include the data of 324 non-academic journals.

1.4 Funding of China's STM Journals

1.4.1 Funding from Supervising and Sponsoring Organizations

A small number of STM journals receive funding support from the supervising organizations, while almost half of the STM journals in China receive funding from the sponsoring organizations. Most of the support from supervising and sponsoring organizations is within a budget of 250 000 yuan per year.

Among the 5111 STM journals that participated in the 2022 annual inspection, 5082 journals reported data on funding from supervising organizations, and 4939 from sponsoring organizations. According to the statistics (table 1.15), 464 journals received funding from their supervising organizations, accounting for 9.13%; 4618 journals did not receive funding from supervising organizations, accounting for 90.87%. Two thousand ninety-five journals received funding from their sponsoring organizations, accounting for 42.42%. In contrast, 2844 journals did not receive funding support from sponsoring organizations,

accounting for 57.58%. The funding support from supervising organizations was concentrated around 250 000 yuan (278 journals, accounting for 59.91%, exclusive of journals reporting zero funding). Similarly, the funding support from sponsoring organizations was concentrated around 300 000 yuan (1153 journals, accounting for 55.04%, excluding journals reporting zero support). There were 87 journals that received funding support of 500 000 yuan or more from their supervising organizations, accounting for 18.75%. There were 538 journals that received funding support of 500 000 yuan or more from their sponsoring organizations, accounting for 25.68%.

Tab. 1.15 – Funding from supervising and sponsoring organizations in 2022.

Funding/ in thousand yuan	From supervising organizations		From sponsoring organizations	
	No. of journals	%	No. of journals	%
<50	43	9.27	133	6.35
50 ~	65	14.01	214	10.21
100 ~	78	16.81	300	14.32
150 ~	33	7.11	217	10.36
200 ~	59	12.72	209	9.98
250 ~	13	2.80	80	3.82
300 ~	34	7.33	198	9.45
350 ~	12	2.59	56	2.67
400 ~	29	6.25	110	5.25
450 ~	11	2.37	40	1.91
500 ~	23	4.96	169	8.07
600 ~	20	4.31	123	5.87
800 ~	8	1.72	69	3.29
1000 ~	23	4.96	142	6.78
2000 ~	7	1.51	35	1.67
10 000 ~	6	1.29	0	0.00
Total	464	100.00	2095	100.00

Note: Among 5111 data items of the 2022 annual inspection, 4618 journals did not receive funding from their supervising organizations (or the support was "0"), and 29 journals did not report this data. Two thousand eight hundred forty-four journals did not receive funding from their sponsoring organizations (or the support was "0"), and 172 journals did not provide this data.
Due to rounding, the aggregated data in the tables may not match the actual calculated data in the main text. The same applies to the following.

1.4.2 National-Level Special Project Funds

Among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals filled in the data on national-level special project funds. Two hundred forty-nine journals received national-level special project funds, accounting for 4.90%. According to the statistics (table 1.16), the funding support from national-level special projects was mainly concentrated in the range of 400 000 yuan to 500 000 yuan. One hundred

twenty-eight journals received national-level funds, accounting for 51.41%. Forty-nine journals received funding support of 1 million yuan or more, accounting for 19.68%.

Tab. 1.16 – National-level special project funds (2022).

Special project funds/in thousand yuan	No. of journals	%	Special project funds/in thousand yuan	No. of journals	%
<100	14	5.62	500 ~	27	10.84
100 ~	8	3.21	1000 ~	35	14.06
200 ~	14	5.62	2000 ~	11	4.42
300 ~	9	3.61	10 000 ~	3	1.20
400 ~	128	51.41	Total	249	100.00

Note: Among the 5111 data items of the 2022 annual inspection, 4834 journals did not receive national-level special project funds (or the support level "0"), and 28 journals did not provide this data.

1.4.3 Publishing Industry Special Project Funds

Among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals filled in the data on publishing industry special project funds, of which 73 journals received funds, accounting for 1.44%. Statistical data show (table 1.17) that the majority (57.53%) of industry special funding grants fall below 300 000 yuan (exclusive), while only six journals (8.22%) received funding of 500 000 yuan or higher at the publishing industry level.

Tab. 1.17 – Publishing industry special project funds in 2022.

Special project funds/in thousand yuan	No. of journals	%	Special project funds/in thousand yuan	No. of journals	%
<50	8	10.96	300 ~	6	8.22
50 ~	8	10.96	400 ~	19	26.03
100 ~	12	16.44	500 ~	6	8.22
150 ~	2	2.74	Total	73	100.00
200 ~	12	16.44			

Note: Among the 5111 data items of the 2022 annual inspection, 5010 journals did not receive publishing industry special project funds (or the support was "0"), and 28 journals did not provide this data.

1.4.4 Provincial and Municipal Special Funds

Among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals reported the data on provincial, regional, and municipal special funds, of which 155 journals received support from these funds, accounting for 3.05%. The statistics

(table 1.18) reveal that more than half of the special fundings fall below 200 000 yuan (exclusive), accounting for 52.90%; 34 journals received support from these special funds of 500 000 yuan or higher, accounting for 21.94%.

Tab. 1.18 – Provincial and municipal special funds in 2022.

Special project funds/in thousand yuan	No. of journals	%	Special project funds/in thousand yuan	No. of journals	%
<50	26	16.77	300 ~	6	3.87
50 ~	37	23.87	400 ~	10	6.45
100 ~	11	7.10	500 ~	7	4.52
150 ~	8	5.16	1000 ~	27	17.42
200 ~	19	12.26	Total	155	100.00
250 ~	4	2.58			

Note: Among the 5111 data items of the 2022 annual inspection, 4928 journals did not receive provincial and municipal special funds (or the support was "0"), and 28 journals did not provide this data.

1.4.5 Funds from Other Organizations[5]

Among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals provided data on other special funds, of which 175 journals received support from these funds, accounting for 3.44%. The statistics (table 1.19) show that most of the funding from other special funds was below, accounting for 51.43%; 22 journals that received 500 000 yuan or more from other special funds, accounting for 12.57%.

Tab. 1.19 – Funds from other organizations in 2022.

Special project funds/in thousand yuan	No. of journals	%	Special project funds/in thousand yuan	No. of journals	%
<50	33	18.86	250 ~	4	2.29
50 ~	39	22.29	300 ~	29	16.57
100 ~	18	10.29	500 ~	22	12.57
150 ~	11	6.29	Total	175	100.00
200 ~	19	10.86			

Note: Among the 5111 data items of the 2022 annual inspection, 4908 journals did not receive funds from other organizations (or the support was "0"), and 28 journals did not provide this data.

[5]"Other special funds" refer to special funds from organizations other than those mentioned above, such as "funds from the supervising or sponsoring organizations", "national-level special funds", "publishing industry special project funds", and "provincial and municipal special funds".

1.5 Business Conditions of China's STM Journals[6]

1.5.1 Print Run

1.5.1.1 Average Print Run

Among the 5111 STM journals participating in the 2022 annual inspection, 4975 journals provided data on "average print run". After excluding 21 invalid data entries reporting zero print runs, valid data covered 4954 journals. The statistics (table 1.20) show that journals with an average print run under 1000 copies accounted for 30.50% (1511 journals); those with an average print number between 1000 and 1500 copies accounted for 25.92% (1284 journals); and those with an average print number of 10 000 copies and above accounted for 4.40% (218 journals).

Tab 1.20 – Average print run of China's STM journals in 2022.

Average print run/copy	No. of journals	%	Average print run/copy	No. of journals	%
<500	469	9.47	5000 ~	311	6.28
500 ~	1042	21.03	10 000 ~	111	2.24
1000 ~	1284	25.92	20 000 ~	68	1.37
1500 ~	445	8.98	50 000 ~	22	0.44
2000 ~	642	12.96	100 000 ~	17	0.34
3000 ~	543	10.96	Total	4954	100.00

Note: Among 5111 data items of the 2022 annual inspection, 136 journals that did not report this data and 21 journals that reported data with a print run of "0" (OA journals) were excluded from the statistical range.

1.5.1.2 Average Circulation

More than half of China's STM journals have an average issue circulation of less than 1000 copies (exclusive). Among the 5111 STM journals participating in the 2022 annual inspection, 4975 journals reported the data on "average issue circulation". After excluding 80 invalid data entries with "0" values, 4895 journals provided valid circulation data. The statistics (table 1.21) show that journals with an average circulation under 500 copies accounted for 17.49% (856 journals); those with an average circulation between 500 and 1000 copies accounted for 24.80% (1214 journals); and those with an average circulation of 10 000 copies and above accounted for 4.09% (200 journals).

[6]Statistical discrepancies exist in journal publishing industry revenue data due to varying reporting standards. The operational figures in this book are derived from the 2022 Annual Inspection Data of NPPA. However, as reporting may be incomplete owing to differences in how individual journals interpret the requirements, all financial statistics (income/expenditure) should be treated as reference-only.

Tab. 1.21 – Average circulation (2022).

Average circulation/copy	No. of journals	%	Average circulation/copy	No. of journals	%
<500	856	17.49	5000 ~	253	5.17
500 ~	1214	24.80	10 000 ~	99	2.02
1000 ~	934	19.08	20 000 ~	65	1.33
1500 ~	448	9.15	50 000 ~	21	0.43
2000 ~	535	10.93	100 000 ~	15	0.31
3000 ~	455	9.30	Total	4895	100.00

Note: Among the 5111 data provided for the 2022 annual inspection, 136 journals that did not provide this data and 80 journals that filled in data with "0" were excluded from the statistical range.

1.5.2 Distribution Methods and Revenue

Among the 5111 STM journals participating in the 2022 annual inspection, 5070 journals reported data on "distribution methods." The statistics show that 3529 journals (69.61%) used postal distribution (combined with other distribution methods), 4017 journals (79.23%) used self-distribution (combined with other distribution methods), 2571 journals (50.71%) used "postal & self-distribution", and 98 journals (1.93%) used OA and distributed complimentary copies.

Among the 5083 STM journals that filled in "distribution revenue" data in the 2022 annual inspection, 1039 journals (20.44%) reported "0" values. The statistics (table 1.22) show that 1711 journals had annual distribution revenue below 50 000 yuan (exclusive), accounting for 42.31%; 2324 journals had annual distribution revenue below 100 000 yuan (exclusive), accounting for 57.47%; and 302 journals had annual distribution revenue of 1 million yuan and above, accounting for 7.47%.

Tab. 1.22 – Distribution revenue of China's STM journals in 2022.

Distribution revenue/in thousand yuan	No. of journals	%	Distribution revenue/in thousand yuan	No. of journals	%	Distribution revenue/in thousand yuan	No. of journals	%
<50	1711	42.31	500 ~	92	2.27	1500 ~	53	1.31
50 ~	613	15.16	600 ~	92	2.27	2000 ~	57	1.41
100 ~	336	8.31	700 ~	45	1.11	3000 ~	45	1.11
150 ~	206	5.09	800 ~	40	0.99	5000 ~	35	0.87
200 ~	300	7.42	900 ~	39	0.96	10 000 ~	18	0.45
300 ~	151	3.73	1000 ~	48	1.19	Total	4044	100.00
400 ~	117	2.89	1200 ~	46	1.14			

Note: Among the 5111 data provided for the 2022 annual inspection, 28 journals that did not provide this data and 1039 journals that filled in data with "0" values were excluded from the statistical range.

1.5.3 Advertising Business Methods and Revenue

Among the 5111 STM journals participating in the 2022 annual inspection, 5070 journals filled in data on "advertising management modes". The statistics show that 1791 journals (35.33%) had no advertising business (29 journals only placed public service advertisements); 2599 journals (51.26%) relied on self-operated advertising; 429 journals (8.46%)

Tab. 1.23 – China's STM journals' advertising revenue in 2022.

Advertising revenue/in thousand yuan	No. of journals	%	Advertising revenue/in thousand yuan	No. of journals	%	Advertising revenue/in thousand yuan	No. of journals	%
<100	624	32.89	500 ~	70	3.69	1000 ~	122	6.43
100 ~	305	16.08	600 ~	74	3.90	1500 ~	89	4.69
200 ~	184	9.70	700 ~	43	2.27	2000 ~	40	2.11
300 ~	130	6.85	800 ~	31	1.63	3000 ~	53	2.79
400 ~	96	5.06	900 ~	36	1.90	Total	1897	100.00

Note: Among the 5111 data items provided for the 2022 annual inspection, 28 journals that did not report this item and 3186 journals that filled in data with "0" values were excluded from the statistical range.

used combined self-operated & commissioned, and 251 journals (4.95%) used commissioned advertising.

Among the 5083 journals that filled in "advertising revenue" data in the 2022 annual inspection, 1897 journals (37.32%) reported advertising revenue. The statistics (table 1.23) show that 624 journals had annual advertising revenue below 100 000 yuan, accounting for 32.89%; 1113 journals had annual advertising revenue below 300 000 yuan, accounting for 58.67%; and 304 journals had annual advertising revenue of 1 million yuan and above, accounting for 16.03%.

1.5.4 Copyright Revenue

Among the 5111 STM journals participating in the 2022 annual inspection, 5083 journals completed data on "copyright revenue", and 1261 journals (24.81%) reported copyright revenue. The statistics (table 1.24) show that 541 journals had annual copyright revenue below, accounting for 42.90%; 1023 journals had annual copyright revenue below 50 000 yuan, accounting for 81.13%; and nine journals had annual copyright revenue of 500 000 yuan and above, accounting for 0.71%.

Tab. 1.24 – China's STM journals copyright revenue in 2022.

Copyright revenue/in thousand yuan	No. of journals	%	Copyright revenue/in thousand yuan	No. of journals	%
<10	541	42.90	500 ~	8	0.63
10 ~	482	38.22	700 ~	0	0.00
50 ~	113	8.96	1000 ~	0	0.00
100 ~	100	7.93	2000 ~	0	0.00
200 ~	7	0.56	3000 ~	1	0.08
300 ~	9	0.71	Total	1261	100.00

Note: Among the 5111 data provided for the 2022 annual inspection, 28 journals that did not provide this data and 3822 journals that filled in data with "0" values were excluded from the statistical range.

1.5.5 Overseas Publishing Revenue[7]

Among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals reported data on "overseas publishing revenue". Among them, 87 journals had overseas publishing revenue, accounting for 1.71%. The statistics show that there were 31 journals with annual overseas publishing revenue below 10 000 yuan; 12 journals with revenue between 10 000 yuan and 20 000 yuan; 8 journals with revenue between 20 000 yuan and 50 000 yuan; 12 journals with revenue between 50 000 yuan and 100 000 yuan; 13 journals with revenue between 100 000 yuan and 200 000 yuan; seven journals with revenue between 200 000 yuan and 500 000 yuan; and only four journals with revenue of 500 000 yuan and above.

1.5.6 Project Activity Revenue

Regarding the "project activity revenue", among the 5111 STM journals that participated in the 2022 annual inspection, 5083 journals filled in relevant data. Among them, 717 journals had project activity revenue, accounting for 14.11%. The statistics (table 1.25) show that there were 154 journals with annual project activity revenue below 100 000 yuan, accounting for 21.48%; 372 journals with annual project activity revenue below 400 000 yuan, accounting for 51.88%; and 171 journals with annual project activity revenue of 1 million yuan and above, accounting for 23.85%.

Tab. 1.25 – China's STM journals project activity revenue in 2022.

Project activity revenue/in thousand yuan	No. of journals	%	Project activity revenue/in thousand yuan	No. of journals	%
<100	154	21.48	1000 ~	55	7.67
100 ~	96	13.39	1500 ~	29	4.04
200 ~	68	9.48	2000 ~	23	3.21
300 ~	54	7.53	3000 ~	36	5.02
400 ~	66	9.21	6000 ~	28	3.91
500 ~	24	3.35	Total	717	100.00
600 ~	84	11.72			

Note: Among the 5111 data items provided for the 2022 annual inspection, 28 journals that did not report this and 4366 journals that filled in data with "0" values were excluded from the statistical range.

[7]Currently, most Chinese-language journals with overseas distribution rely on China International Book Trading Corporation for international sales, though resulting foreign revenue remains minimal. Meanwhile, most English-language journals in China adopt co-publishing models with foreign publishers, where generated sales income is typically directly allocated to expense accounts rather than being recorded as official overseas publishing revenue. Consequently, the "overseas publishing revenue" metric in annual inspections represents incomplete statistics and should be treated as reference-only.

1.5.7 New Media Investment and Revenue

Among the 5111 STM journals participating in the 2022 annual inspection, 5083 journals completed data on "new media investment", among which 1534 journals made new media investment, accounting for 30.18%. The statistics (table 1.26) reveal that there were 500 journals with annual new media investment below 10 000 yuan (exclusive), occupying 32.59%; 799 journals with annual new media investment below 20 000 yuan (not including), accounting for 52.09%; and 183 journals with annual new media investment of 100 000 yuan and above, accounting for 11.93%.

Among the 5111 STM journals, 5083 journals reported relevant data on "new media revenue", of which 351 journals had new media revenue, accounting for 6.91%. The statistics (table 1.27) show that there were 75 journals with annual new media revenue below, accounting for 21.37%; 196 journals with annual new media revenue below 60 000 yuan, accounting for 55.84%; and 130 journals with annual new media revenue of 100 000 yuan and above, accounting for 37.04%.

Tab. 1.26 – China's STM journals' new media investment in 2022.

Investment/ in thousand yuan	No. of journals	%	Investment/ in thousand yuan	No. of journals	%
<10	500	32.59	100 ~	86	5.61
10 ~	299	19.49	200 ~	65	4.24
20 ~	330	21.51	500 ~	22	1.43
40 ~	148	9.65	1000 ~	10	0.65
60 ~	74	4.82	Total	1534	100.00

Note: Among the 5111 data items provided for the 2022 annual inspection, 28 journals that did not report this and 3549 journals that filled in data with "0" values were excluded from the statistical range.

Tab. 1.27 – China's STM journals' new media revenue in 2022.

Revenue/ in thousand yuan	No. of journals	%	Revenue/ in thousand yuan	No. of journals	%
<10	75	21.37	100 ~	36	10.26
10 ~	32	9.12	200 ~	33	9.40
20 ~	54	15.38	500 ~	16	4.56
40 ~	35	9.97	1000 ~	45	12.82
60 ~	25	7.12	Total	351	100.00

Note: Among the 5111 data provided for the 2022 annual inspection, 28 journals that did not report this data and 4732 journals that filled in data with "0" values were excluded from the statistical range.

1.5.8 Total Revenue

Among all journals participating in the 2022 annual inspection, 5083 journals filled in relevant data on "journal total revenues". After excluding invalid data, 4629 journals (91.07% of the total journals) submitted valid data. Statistical data (table 1.28) reveal that

Tab. 1.28 – China's STM journals' total revenues in 2022.

Total revenues/in thousand yuan	No. of journals	%	Total revenues/in thousand yuan	No. of journals	%	Total revenues/in thousand yuan	No. of journals	%
<100	435	9.40	800 ~	188	4.06	2500 ~	108	2.33
100 ~	382	8.25	900 ~	149	3.22	3000 ~	154	3.33
200 ~	359	7.76	1000 ~	265	5.72	4000 ~	162	3.50
300 ~	363	7.84	1200 ~	213	4.60	6000 ~	108	2.33
400 ~	317	6.85	1400 ~	148	3.20	10 000 ~	107	2.31
500 ~	278	6.01	1600 ~	117	2.53	Total	4629	100.00
600 ~	278	6.01	1800 ~	100	2.16			
700 ~	224	4.84	2000 ~	174	3.76			

Note: Among the 5111 data provided for the 2022 annual inspection, 28 journals that did not submit this data and 454 journals that filled in data with "0" values were excluded from the statistical range.

there were 435 journals with annual total revenue below 100 000 yuan, accounting for 9.40%; 2412 journals with total yearly revenue below 700 000 yuan, accounting for 52.11%; and 1656 journals with annual total revenue of 1 million yuan and above, accounting for 35.77%.

1.5.9 Total Expenditure[8]

Among the 5111 STM journals participating in the 2022 annual inspection, 5083 journals submitted relevant data on "journal total expenditure". After excluding invalid data, 4856 journals reported valid data, accounting for 95.53%. Statistical data (table 1.29) show that there were 197 journals with annual total expenses below 100 000 yuan, accounting for 4.06%; 2414 journals with total yearly expenditure of less than 700 000 yuan, accounting for 49.71%; and 1719 journals with total yearly expenses of 1 million yuan and above, accounting for 35.40%.

Tab. 1.29 – China's STM journals total expenditures in 2022.

Total expenses/in thousand yuan	No. of journals	%	Total expenses/in thousand yuan	No. of journals	%	Total expenses/in thousand yuan	No. of journals	%
<100	197	4.06	700 ~	270	5.56	1800 ~	101	2.08
100 ~	356	7.33	800 ~	251	5.17	2000 ~	185	3.81
200 ~	400	8.24	900 ~	202	4.16	2500 ~	127	2.62
300 ~	390	8.03	1000 ~	302	6.22	3000 ~	151	3.11
400 ~	387	7.97	1200 ~	252	5.19	4000 ~	117	2.41
500 ~	354	7.29	1400 ~	171	3.52	6000 ~	181	3.73
600 ~	330	6.80	1600 ~	132	2.72	Total	4856	100.00

Note: Among the 5111 data provided for the 2022 annual inspection, 28 journals that did not provide this data and 227 journals that filled in data with "0" values were excluded from the statistical range.

[8]Due to varying interpretations by reporting entities, the "total expenditure" category may encompass only printing costs for some cases and compreshensive outlays (salaries, fixed assets, etc.) for other cases. Therefore, the statistical results of total expenditure in the annual inspection should be treated as reference-only.

Among the 5111 STM journals participating in the 2022 annual inspection, 5083 journals reported data on "total employee training expenses". After excluding invalid data, 3510 journals (excluding journals with data of "0" values) submitted valid data, accounting for 69.05%. The statistics (table 1.30) show that there were 1371 journals with annual employee training expenses below 10 000 yuan, accounting for 39.06%; 3180 journals with annual employee training expenses below 50 000 yuan, accounting for 90.60%; and 85 journals with annual employee training expenses of 100 000 yuan and above, accounting for 2.42%.

Tab. 1.30 – Training expenses for China's STM journal staff in 2022.

Trainingexpenses/ in thousand yuan	No. of journals	%	Training expenses/ in thousand yuan	No. of journals	%
<5	792	22.56	30 ~	274	7.81
5 ~	579	16.50	40 ~	105	2.99
10 ~	641	18.26	50 ~	193	5.50
15 ~	244	6.95	70 ~	52	1.48
20 ~	450	12.82	100 ~	85	2.42
25 ~	95	2.71	Total	3510	100.00

Note: Among the 5111 data provided for 2022 annual inspection, 28 journals that did not give this data and 1573 journals that filled in data with "0" were excluded from the statistical range.

1.6 Development Progress of New Media for Journals

1.6.1 Annual Visits to Journal Websites

Based on the data from the National Journal Annual Inspection Report 2022, among the 5111 STM journals, 2849 journals (55.74% of all journals) reported the number of annual visits to their journal websites. Statistics show (table 1.31) that 604 journals (30.77%) received less than 50 000 visits per year to their sites; 914 journals (46.56%) received less than 100 000 visits annually; and 202 journals (10.29%) received over 1 million visits annually.

Tab. 1.31 – Annual website visits of China's STM journals in 2022.

Visits (in thousands)	No. of journals	%	Visits (in thousands)	No. of journals	%
<50	604	30.77	1000 ~	81	4.13
50 ~	310	15.79	1500 ~	40	2.04
100 ~	345	17.58	2000 ~	38	1.94
200 ~	231	11.77	3000 ~ 5000	43	2.19
400 ~	155	7.90	Total	1963	100.00
600 ~	116	5.91			

Note: National Journal Annual Inspection Report 2022 listed data of 5111 journals, among which 2262 journals did not report the data of annual visits to their websites, and 886 journals reported zero visits, which were not included in this table.

1.6.2 Official Mobile Device Applications

Based on the data from the National Journal Annual Inspection Report 2022, among the 5111 STM journals, 2709 journals (53.00%) reported data on their mobile device applications (hereinafter "mobile apps"). According to the statistics, 548 journals (20.23%) reported data from their official mobile apps, and 2161 journals have not developed any apps yet. And 434 journals (79.20% of all the journals having official mobile apps) were running one official mobile app; 66 journals (12.04%) running two official apps; 26 journals (4.74%) running three official apps; 15 journals (2.74%) running four official apps; and seven journals (1.28%) running more than five official apps.

Among 548 journals with official mobile apps, 431 journals reported the total number of downloads, including 394 journals with non-zero downloads. As shown in table 1.32, 72 journals (18.27%) generated less than 10 000 downloads, 190 journals (48.22%) generated downloads within 50 000, and 25 journals (6.35%) generated over 500 000 downloads, or 6.35%, from mobile device users.

Tab. 1.32 – Mobile apps of China's STM journals by downloads in 2022.

Download(s) (in thousands)	No. of journals	%	Download(s) (in thousands)	No. of journals	%
<10	72	18.27	200 ~	50	12.69
10 ~	78	19.80	500 ~	22	5.58
30 ~	40	10.15	800 ~ 1000	3	0.76
50 ~	72	18.27	Total	394	100.00
100 ~	57	14.47			

Note: Among 548 journals with official mobile apps, 117 journals did not report download data; 37 journals reported zero downloads, which were excluded from this table.

Among these 548 journals, 440 STM journals reported data on active subscribers. Among them, 403 journals had active subscribers. According to the statistics (table 1.33), 56 journals (13.90%) had active subscribers to their apps below 1000; 197 journals (48.88%) counted 7000 or fewer active subscribers; and 33 journals (8.19%) had more than 100 000 active subscribers.

Tab. 1.33 – Number of active subscribers of mobile device apps of China's STM journals in 2022.

Number of active users	No. of journals	%	Number of active users	No. of journals	%
<1000	56	13.90	20 000 ~	50	12.41
1000 ~	67	16.63	50 000 ~	55	13.65
3000 ~	44	10.92	100 000 ~	26	6.45
5000 ~	30	7.44	500 000 ~ 1000 000	7	1.74
7000 ~	24	5.96	Total	403	100.00
10 000 ~	44	10.92			

Note: Among 548 journals that have mobile device apps, 108 journals did not report the number of active users, and 37 journals reported 0, which are not listed in this table.

1.6.3 Official WeChat Accounts

Based on the data from the *National Journal Annual Inspection Report 2022*, among the 5111 STM journals, 2385 journals created official accounts on Tencent's WeChat (accounting for 46.66%); 930 journals have not set up any WeChat account yet (18.20%); the data of 1796 journals left were seen as invalid. According to the statistics, there were 2238 journals with one official WeChat account (93.84%), 122 journals with two accounts (5.12%), and 25 journals with more than three accounts (1.05%).

Among 2385 journals with official WeChat accounts, 2154 journals reported the number of their subscribers (66 journals reported 0, which were treated as invalid data). As listed in table 1.34, 435 journals counted less than 1000 subscribers (exclusive), accounting for 20.83%; 1190 journals had less than 5000 subscribers, accounting for 56.99%; and 118 journals had more than 100 000 WeChat subscribers, occupying 5.65%.

Tab. 1.34 – Subscribers' numbers on official WeChat accounts of China's STM journals in 2022.

No. of subscribers	No. of journals	%	No. of subscribers	No. of journals	%
<500	219	10.49	10 000 ~	208	9.96
500 ~	216	10.34	20 000 ~	201	9.63
1000 ~	285	13.65	50 000 ~	93	4.45
2000 ~	183	8.76	100 000 ~	109	5.22
3000 ~	287	13.75	500 000 ~	9	0.43
5000 ~	278	13.31	Total	2088	100.00

Note: Among 2385 STM journals with WeChat official accounts, 231 journals did not report the number of their subscribers on this platform, and 66 journals reported zero subscribers, which were not listed in this table.

Among the 2385 journals with official WeChat accounts, 2064 journals reported the average views per post (47 journals reported 0, seen as invalid). There were 309 journals (accounting for 15.32%) that received less than 100 views (exclusive) per post on average, while 1150 journals (57.02%) received less than 500 views. And 19 journals (0.94%) received 10 000 average views per post, as shown in table 1.35.

Tab 1.35 – Average views per post on official WeChat accounts of China's STM journals in 2022.

Average views of each post	No. of journals	%	Average views of each post	No. of journals	%
<100	309	15.32	3000 ~	92	4.56
100 ~	300	14.87	5000 ~	36	1.78
200 ~	541	26.82	10 000 ~	17	0.84
500 ~	382	18.94	50 000 ~	2	0.10
1000 ~	338	16.76	Total	2017	100.00

Note: Among 2385 journals with official WeChat accounts, 321 journals did not report the data of average views per post they published, and 47 journals reported the data as 0, which were not included in this table.

Among 2385 journals that have created WeChat official accounts, 1839 journals reported data on annual 100 000+ view articles, of which 113 journals (6.14%) reported more than zero such high-traffic posts. Statistics showed that 79 journals (69.91%) published less than 10 posts with over 100 000+ views; 28 journals (24.78%) reported 10 to 100 such posts; and six journals (5.31%) achieved more than 100 such posts.

1.6.4 Official Weibo Account

Based on the data from the *National Journal Annual Inspection Report 2022*, among the 5111 STM journals, 5082 journals reported official Weibo account status. Of the 5082 journals, there were 4533 journals (89.20%) without any official Weibo accounts and 549 journals (10.80%) with Weibo accounts. Statistics showed that 531 journals (96.72%) have created at least one official Weibo account; 18 journals (3.28%) operate dual accounts.

Among China's 549 STM journals with official Weibo accounts, 382 journals reported the data of their followers. As listed in table 1.36, 83 journals (accounting for 22.37%) have less than 500 (exclusive) followers, while 189 or 50.94% of journals report less than 5000 followers, and 53 of the most followed journals (14.29%) had more than 100 000 followers.

Tab. 1.36 – Number of followers on Weibo accounts of China's STM journals in 2022.

No. of follower	No. of journals	%	No. of follower	No. of journals	%
<500	83	22.37	30 000 ~	13	3.50
500 ~	67	18.06	50 000 ~	23	6.20
2000 ~	39	10.51	10 0000 ~	44	11.86
5000 ~	40	10.78	500 000 ~ 1 000 000	9	2.43
10 000 ~	53	14.29	Total	371	100.00

Note: Among 549 STM journals that have launched their own official Weibo accounts, 167 journals did not report the data of followers, and 11 journals reported zero followers, which were not included in this table.

Chapter 2

Impact Analysis of China's Scientific Journals

Junhong WU and Xiukun SUN

Abstract

The average size of citable literature in China's scientific journals is still larger than the average level of international journals. According to the *Annual Report for Chinese Academic Journal Impact Factors* (*Natural Science*) (2016, 2019, and 2022 editions; hereafter referred to as the *Impact Factor Annual Report*), the average number of citable articles in Chinese-language STM journals decreased from 295.44 in 2015 to 261.52 in 2021, while the average number of international STM journals was 216.30, representing a reduction of 11.48%. The average number of citable articles per English-language STM journals declined from 121.10 in 2015 to 114.10 in 2021, a total decrease of 5.78%.

The composite total cited frequency of China's scientific journals has increased year by year. In 2021, the composite total citations of Chinese-language scientific journals reached 9 377 600, representing an increase of 21.66% over 2015 and 17.73% over 2018. Among them, 4 877 600 times (or 52.01%) were citations from journal articles, an increase of 30.14% compared with 2015 and 13.44% compared with 2018. The 2021 composite total citation counts for China's English-language scientific journals were 360 100 times, 70.91% higher than in 2015 and 53.70% higher than in 2018. Of these, 178 700 times were cited by journal articles, representing a 61.01% increase from 2015 and a 43.59% increase from 2018.

The impact factor and immediacy index of China's STM journals have been improving year by year. The average composite impact factor of Chinese-language scientific journals was 1.125 in 2021, increasing 80.87% over 2015 and 46.87% over 2018. The average composite immediacy index per journal was 0.180, increasing 119.51% over 2015 and 83.67% over 2018. The English-language scientific journals had an average composite impact factor of 1.198 in 2021, which increased 75.40% from 2015 and 53.98% from 2018. The average composite immediacy index per journal was 0.215, rising 31.10% over 2015 and 28.74% over 2018.

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The international total cited frequency of China's STM journals has been growing gradually. According to the statistics in the *Annual Report for International Citation of Chinese Academic Journals* (*Natural Science*) (hereafter referred to as the *International Citation Annual Report*), the international total cited times of Chinese-language STM journals were 692 600 in 2021, increasing 128.31% over 2015 and 44.71% over 2018. The average international total cited times per journal were 224.15, which was 77.04% higher than in 2015 and 29.72% higher than in 2018. The global total cited count of English-language scientific journals was 882 600, which was 338.29% higher than 2015 and 142.33% higher than 2018. The average international total cited times per journal were 2486.15, 162.98% higher than 2015 and 69.29% higher than 2018.

The international citation impact factor and immediacy index of China's STM journals has been progressively improving. In 2021, the average international citation impact factor for Chinese-language STM journals was 0.094, representing a 147.37% increase from 2015 and a 67.86% increase from 2018. Meanwhile, the average international citation immediacy index was 0.023, representing a 360.00% increase from 2015 and a 130.00% rise from 2018. For English-language STM journals in 2021, the average international citation impact factor was 4.233, showing a 263.97% growth compared to 2015 and a 109.55% increase compared to 2018. The average international citation immediacy index was 1.089, up by 291.73% from 2015 and by 90.05% from 2018.

The international influence indicators have been increasing year by year. According to the *World Journal Clout Index* (*WJCI*) *of Scientific and Technological Periodicals (2022 Edition)* (hereafter referred to as the *WJCI Report*), calculating the average WJCI value by country reveals the overall influence level of the country's journals. In 2021, the country with the highest average WJCI per journal was the Netherlands, followed by the United Kingdom, the United States, and Switzerland. For the 1114 journals in the Netherlands, the average WJCI was 3.093. For the 1635 journals in China, the average WJCI was 1.399, ranking 9th globally.

As China's scientific journals play a bigger role in international academic communications, more and more journals are receiving attention and recognition from the renowned international databases. By September 2023, there were 2066 STM journals in China that were indexed by at least one of the following databases: Web of Science (WoS), Scopus, EI, PubMed, Chemical Abstracts-ACS, MathSciNet-MSN, GeoRef, and CAB Abstracts. Of the total 434 English-language STM journals in China, 386 (88.94%) were indexed by the above-mentioned databases. Compared with the 2022 statistics, the eight databases had newly indexed 35 additional English-language STM journals from China.

This chapter analyzes the overall domestic and international influence of China's STM journals based on data from the *Impact Factor Annual Report* and *International Citation Annual Report* published by China National Knowledge Infrastructure (CNKI), as well as the *WJCI Report*.

The Impact Factor Annual Report is a CD-ROM-based yearbook that compiles and provides statistical data on academic papers published in China's journals during the reporting year, along with citation data from domestic journals, conference proceedings, and doctoral/master's theses. It releases dozens of quantitative evaluation indexes, serving as an authoritative reference tool for assessing the academic impact of China's scientific journals. *The Impact Factor Annual Report (2022 Edition)* included 4010 journals, covering

3821 scientific journals that participated in the annual inspection, including 3544 Chinese-language scientific journals and 277 English-language scientific journals.

The *International Citation Annual Report (2022 Edition)* systematically tracked citations of 3590 China's STM journals across more than 22 000 international academic sources (including journals, books, and conference proceedings) worldwide. It publishes multiple evaluation indices every year, comprehensively revealing the global impact of China's STM journals. The comprehensive evaluation index in the *International Citation Annual Report* is called the "Clout Index" (CI). Based on the CI index, the top 5% of journals are selected as the "most internationally influential journals in China" (175 journals); the journals ranked between the top 5% and 10% are "outstanding journals with international influence in China" (175 journals); these two types of journals are collectively referred to as *"TOP Journals*", totaling 350 journals. The *International Citation Annual Report (2022 Edition)* contained 3445 STM journals that participated in the annual inspection (comprising 3090 Chinese-language scientific journals and 355 English-language scientific journals).

The *WJCI Report (2022 Edition)* was jointly developed by six institutions, including the Institute of Scientific and Technical Information of China, CNKI, Tsinghua University Library, Wanfang Data, the Society for China University Journals, and China Editology Society of Science Periodicals. The *WJCI Report* conducts subject-specific quantitative evaluations of both Chinese and international scientific journals using uniform standards. From over 60 000 active global scientific and academic journals, the *WJCI report* selects 15 022 high-quality journals that demonstrate strong regional, disciplinary, and industrial representation as source journals. Based on the classification systems of various major databases, a journal classification system has been created that comprehensively covers all fields of science and technology and reflects the development of emerging and interdisciplinary fields. The report introduces a novel evaluation metric—WJCI—constructed by integrating two components: the *World Academic Journal Citation Index* (WAJCI), representing academic influence through citation data, and the WI (Web Impact), reflecting social impact through online usage data. Together, these indicators provide a multidimensional evaluation of journal influence. Compared with other journal evaluation systems currently in use, the *WJCI report* can reflect the global impact of various STM journals more scientifically and comprehensively. Within each discipline, journals are ranked by WJCI and divided into four zones: Quartile 1, Quartile 2, Quartile 3, and Quartile 4. The 2022 Report included 1635 journals from China, covering 1545 journals with annual inspection data (1220 Chinese-language scientific journals and 325 English-language scientific journals).

2.1 Journal Analysis by Discipline

According to *the Impact Factor Annual Report (2022 Edition)*, (with the statistical year being 2021), 3821 journals were distributed in 65 disciplines, with 422 interdisciplinary journals. There were 3544 Chinese-language scientific journals, and among them, 397 were interdisciplinary journals, and the remaining 277 were English-language scientific journals, including 25 interdisciplinary journals. In four disciplines, the total number of journals have increased by more than 10 new journals, which are "Natural Science and Engineering"

(32 new titles of journals added compared with 2018, and 39 more compared with 2015), "Civil Engineering" (15 new journals more than in 2018 and 33 more than in 2015), "Electrical Engineering" (13 new titles added compared with the number in 2018 and 24 more compared with 2015), "Radio Electronics & Telecommunications" (11 new titles added compared with 2018 and 34 new titles compared with 2015). However, there were nine disciplines with a decrease in the number of journals compared to 2018, among which the disciplines with the most significant decrease were "Basic Medical Sciences" (decreased by three since 2018 and 7 since 2015), "Health Administration" (with a decrease of 2 journals compared to 2018, and 1 compared to 2015), and "Mathematics" (with a decrease of 2 journals compared to 2018, and 1 compared to 2015) (table 2.1).

2.2 Volume of Citable Literature

Citable literature generally refers to literature that can be cited by other academic papers during the research process. Usually, journal articles with academic results are different from other non-innovative research papers, such as narratives, introductory papers, popular science materials, secondary literature, fiction, directories, and indices. The quantity of citable literature in a journal is an essential indicator of the amount of scientific research information that the journal disseminates. The volume of citable literature of Chinese-language scientific journals was analyzed according to the *Impact Factor Annual Report* to reflect the changes in the journals' accommodation of research information.

According to the *Impact Factor Annual Report* (2016, 2019, and 2022 editions; data years: 2015, 2018, and 2021), the average volume of citable articles in Chinese-language STM journals decreased from 295.44 articles in 2015 to 261.52 articles in 2021, reflecting a downward trend and an overall drop of 11.48%, while the average volume of citable articles in English-language STM journals dwindled from 121.10 articles in 2015 to 114.10 articles in 2021, down by 5.78%. Yet the average number of citable articles per journal of the Chinese-language STM journals was still larger than that of international journals (table 2.2). According to the *Journal Citation Reports* 2022 (JCR 2022), published by Clarivate, the average number of annual citable literature per journal (articles plus reviews) of international STM journals was 216.30 articles.

2.3 Analysis of Domestic Influence

2.3.1 Total Cited Frequency

Total cited frequency reflects the overall academic impact of the journal. The *Impact Factor Annual Report* discloses the composite total cited frequency for Chinese source journals, doctoral and master's theses, and conference proceedings. The composite total cited times represent the total citations received by all citable literature published by a journal since its launch during the statistical year, reflecting the overall influence of the journal in various scientific research and talent development activities. In 2021, the number of composite total citations of Chinese-language STM journals in China reached 9 377 600,

TAB. 2.1 – No. of journals in various disciplines, as in *the Impact Factor Annual Report* 2022.

No.	Discipline	2015				2018				2021			
		No. of journals	Percentage/ %	No. of Chinese language journals	No. of English language journals	No. of journals	Percentage/ %	No. of Chinese language journals	No. of English language journals	No. of journals	Percentage/ %	No. of Chinese language journals	No. of English language journals
1	Natural Science & Engineering Technology in General	227	5.90	225	2	234	5.77	230	4	266	6.25	261	5
2	Medicine & Health in General	182	4.73	178	4	188	4.64	184	4	192	4.51	187	5
3	Chemical Engineering	171	4.45	168	3	170	4.19	166	4	176	4.14	172	4
4	Civil Engineering	136	3.54	132	4	154	3.80	148	6	169	3.97	162	7
5	Radio Electronics, Telecommunications	125	3.25	117	8	148	3.65	134	14	159	3.74	143	16
6	Transportation Engineering	126	3.28	124	2	141	3.48	138	3	147	3.45	144	3
7	Engineering Technology in General	134	3.49	120	14	135	3.33	121	14	143	3.36	128	15
8	Automation Technology, Computer Technology	105	2.73	97	8	134	3.30	123	11	138	3.24	126	12
9	Traditional Chinese Medicine & Herbalism	120	3.12	114	6	121	2.98	115	6	129	3.03	119	10
10	Electrical Engineering	102	2.65	102	—	113	2.79	113	—	126	2.96	122	4
11	Clinical Medicine in General	96	2.50	96	—	109	2.69	109	—	111	2.61	108	3
12	Geology	103	2.68	97	6	102	2.51	95	7	105	2.47	96	9
13	Internal Medicine	87	2.26	85	2	96	2.37	92	4	99	2.33	95	4
14	Agricultural Science in General	92	2.39	89	3	96	2.37	92	4	99	2.33	95	4
15	Metal Science & Metalwork	93	2.42	84	9	84	2.07	75	9	91	2.14	82	9
16	Biology	90	2.34	70	20	91	2.24	67	24	91	2.14	64	27
17	Oil & Gas Industry	82	2.13	80	2	90	2.22	88	2	90	2.11	87	3
18	Mechanical Engineering	84	2.18	80	4	85	2.10	80	5	90	2.11	84	6
19	Metallurgical Engineering Technology	75	1.95	70	5	84	2.07	79	5	89	2.09	84	5
20	Surgery	72	1.87	70	2	79	1.95	76	3	82	1.93	78	4
21	Hydraulic Engineering	65	1.69	63	2	75	1.85	73	2	77	1.81	75	2
22	Preventive Medicine & Hygiene	78	2.03	77	1	77	1.90	76	1	76	1.79	76	—
23	Mining Engineering Technology	70	1.82	68	2	75	1.85	73	2	75	1.76	73	2
24	Environmental Science & Technology	62	1.61	59	3	68	1.68	62	6	73	1.72	67	6
25	Animal Husbandry, Veterinary Science	64	1.66	63	1	66	1.63	64	2	69	1.62	67	2
26	Forestry	68	1.77	66	2	68	1.68	66	2	67	1.57	65	2
27	Pharmacy	61	1.59	58	3	62	1.53	58	4	64	1.50	58	6
28	Aeronautical And Space Science & Technology	51	1.33	49	2	53	1.31	51	2	60	1.41	57	3

Tab. 2.1 – (continued).

No.	Discipline	2015				2018				2021			
		No. of journals	Percentage/ %	No. of Chinese language journals	No. of English language journals	No. of journals	Percentage/ %	No. of Chinese language journals	No. of English language journals	No. of journals	Percentage/ %	No. of Chinese language journals	No. of English language journals
29	Energy & Power Engineering	44	1.14	42	2	52	1.28	49	3	56	1.32	51	5
30	Basic Medicine	63	1.64	60	3	59	1.45	56	3	56	1.32	53	3
31	Engineering & Technology Science Basic Disciplines	49	1.27	48	1	48	1.18	46	2	53	1.25	51	2
32	Food Science & Technology	51	1.33	51	—	51	1.26	51	—	52	1.22	51	1
33	Chemistry	50	1.30	41	9	51	1.26	40	11	50	1.17	39	11
34	Agronomy	47	1.22	46	1	49	1.21	47	2	50	1.17	47	3
35	Physics	44	1.14	34	10	47	1.16	34	13	48	1.13	34	14
36	Mathematics	43	1.12	26	17	44	1.08	26	18	42	0.99	25	17
37	Oncology	32	0.83	29	3	37	0.91	33	4	38	0.89	34	4
38	Textile Science and Technology	32	0.83	31	1	34	0.84	33	1	37	0.87	36	1
39	Atmospheric Science	35	0.91	29	6	35	0.86	29	6	36	0.85	30	6
40	Geophysics	32	0.83	26	6	33	0.81	27	6	36	0.85	27	9
41	Material Sciences	30	0.78	22	8	26	0.64	17	9	34	0.80	22	12
42	Obstetrics & Gynecology and Pediatrics	27	0.70	26	1	32	0.79	31	1	33	0.78	31	2
43	Neurology and Psychiatry	28	0.73	25	3	32	0.79	29	3	33	0.78	29	4
44	Light Industry (Excl Textile & Food)	25	0.65	24	1	29	0.71	28	1	30	0.70	29	1
45	Weapon Industry & Military Technology	25	0.65	24	1	25	0.62	24	1	29	0.68	28	1
46	Surveying & Mapping Science and Technology	25	0.65	24	1	26	0.64	25	1	28	0.66	26	2
47	Marine Sciences	27	0.70	20	7	28	0.69	22	6	27	0.63	21	6
48	Nursing	19	0.49	19	—	22	0.54	22	—	26	0.61	25	1
49	Otorhinolaryngology and Ophthalmology	25	0.65	25	—	25	0.62	24	1	26	0.61	24	2
50	Healthcare Management	27	0.70	27	—	28	0.69	28	—	26	0.61	26	—
51	Horticulture	21	0.55	21	—	22	0.54	21	1	25	0.59	24	1
52	Aquaculture	22	0.57	22	—	24	0.59	24	—	24	0.56	24	—
53	Agricultural Basic Science	21	0.55	19	2	22	0.54	21	1	22	0.52	20	2
54	Plant Protection	18	0.47	18	—	19	0.47	19	—	21	0.49	21	—
55	Mechanics	19	0.49	13	6	19	0.47	13	6	21	0.49	15	6
56	Stomatology	18	0.47	17	1	19	0.47	17	2	20	0.47	18	2
57	Agricultural Engineering	19	0.49	19	—	20	0.49	20	—	20	0.47	20	—
58	Military Medicine & Special Medicine	19	0.49	19	—	17	0.42	17	—	18	0.42	18	—
59	Safety Science & Technology	19	0.49	19	—	17	0.42	17	—	18	0.42	18	—
60	Physical Geography	20	0.52	13	7	18	0.44	13	5	17	0.40	12	5

Tab. 2.1 – (continued).

61	Nuclear Science & Technology	14	0.36	13	1	15	0.37	14	1	16	0.38	15	1
62	Resource Science	14	0.36	14	—	13	0.32	13	—	12	0.28	12	—
63	Dermatology & Venereology	8	0.21	7	1	8	0.20	7	1	9	0.21	8	1
64	Astronomy	5	0.13	4	1	5	0.12	4	1	7	0.16	5	2
65	Systems Science	7	0.18	6	1	7	0.17	6	1	7	0.16	6	1
	Total	3513	100.00	3313	200	3647	100.00	3410	237	3821	100.00	3544	277

Note: The data source is the *Impact Factor Annual Report* 2016, 2019, and 2022 editions.
Some journals belong to two or more disciplines. The total number is the result after deduplication.

Tab. 2.2 – Statistics of citable literature published in China's STM journals.

Statistical year	Chinese-language journals			English-language journals		
	No. of journals	No. of citable articles	No. of citable articles per journal	No. of journals	No. of citable articles	No. of citable articles per journal
2015	3313	978 792	295.44	200	24 220	121.10
2018	3410	986 516	289.30	237	25 328	106.87
2021	3544	926 822	261.52	277	31 607	114.10

Data source: The *Impact Factor Annual Report* 2016, 2019, and 2022 editions.

representing a 21.66% increase over 2015 and a 17.73% increase over 2018. Among them, 4 877 600 times were cited by journal papers, accounting for 52.01%, a 30.14% increase in citations from 2015 and a 13.44% increase from 2018. The composite total cited frequency of English-language STM journals in China was 360 100 times, 70.91% higher than in 2015 and 53.70% higher than in 2018. Of all the cited times, 178 700 were cited by journal articles, a 61.01% increase from 2015 and a 43.59% increase from 2018 (table 2.3).

2.3.2 Impact Factor and Immediacy Index

The *Impact Factor Annual Report* puts forward a series of indicators, including the composite impact factor, comprehensive impact factor, basic research impact factor, and technical research impact factor, from diverse measurement perspectives. To further reflect the objectivity of journal citation, the *Impact Factor Annual Report* calculates various types of citation impact factors, thus constituting a multi-angle measurement evaluation of the journal's impact factor index system. Among them, the composite total cited frequency, composite impact factor, and composite immediacy index are based on the sum of citations by statistical source journals, doctoral and master's theses, and conference proceedings, which contain citations of both scientific and technological literature, as well as citation of cross-disciplinary and social sciences literature, thus reflecting in a more comprehensive way the influence that journals have exerted in the cause of scientific research and education.

According to the data from the *Impact Factor Annual Report*, the average composite impact factor of Chinese-language scientific journals reached 1.125 in 2021, increasing 80.87% over that of 2015, and 46.87% over 2018. The composite immediacy index per journal was 0.180, representing a 119.51% increase compared to 2015 and an 83.67% increase compared to 2018 (table 2.4).

The average composite impact factor per journal of English-language STM journals in 2021 was 1.198, representing a 75.40% increase from 2015 and a 53.98% increase from 2018. The average composite immediacy index per journal in 2021 was 0.215, increasing 31.10% from 2015 and 28.74% from 2018 (table 2.4).

2.3.3 Self-Citation Rate of STM Journals

The self-citation rate refers to the ratio of citations from a journal's publications to the total citations from all source journals during the statistical year. According to the *Impact*

TAB. 2.3 – Total cited frequency of China's STM journals disclosed by the *Impact Factor Annual Report*.

Language	Statistical year	No. of journals	Composite total cited frequency	Journal article citation		Doctoral thesis citation		Master's thesis citation		Proceedings citation	
				Citations	%	Citations	%	Citations	%	Citations	%
Chinese	2015	3313	7 708 133	3 748 048	48.62	475 092	6.16	3 253 159	42.20	231 834	3.01
	2018	3410	7 965 429	4 299 680	53.98	529 874	6.65	2 962 384	37.19	173 491	2.18
	2021	3544	9 377 617	4 877 606	52.01	539 228	5.75	3 812 105	40.65	148 678	1.59
English	2015	200	210 709	110 982	52.67	23 977	11.38	69 317	32.90	6433	3.05
	2018	237	234 314	124 449	53.11	33 815	14.43	70 701	30.17	5349	2.28
	2021	277	360 131	178 691	49.62	51 994	14.44	125 111	34.74	4335	1.20

Note: The data source is from the *Impact Factor Annual Report* 2016, 2019, and 2022 editions.

Tab. 2.4 – Impact Factor and Immediacy Index of China's STM journals disclosed by the *Impact Factor Annual Report*.

Language	Statistical year	No. of journals	Composite impact factor		Composite immediacy index	
			Average	Growth rate/%	Average	Growth rate/%
Chinese	2015	3313	0.622	–	0.082	–
	2018	3410	0.766	23.15	0.098	19.51
	2021	3544	1.125	46.87	0.180	83.67
English	2015	200	0.683	–	0.164	–
	2018	237	0.778	13.91	0.167	1.83
	2021	277	1.198	53.98	0.215	28.74

Note: Data source is the *Annual Report for Chinese Academic Journals Impact Factors* 2016, 2019, and 2022 editions.

Factor Annual Report 2016, 2019, and 2022 editions, the average self-citation rate of Chinese-language STM journals was around 10%, while the average self-citation rate of English-language STM journals was around 18%. In 2021, Chinese-language STM journals with a self-citation rate of less than 20% accounted for 87.61%. In 2021, only 59.93% of English-language scientific journals had a self-citation rate of less than 20% (table 2.5).

2.4 Analysis of International Influence

2.4.1 Performance Reflected in the International Citation Annual Report

2.4.1.1 Total Cited Frequency

The citation count of the *International Citation Annual Report* is derived from the number of citations of more than 22 000 international scholarly journals, books, and academic conference proceedings. The number of total cited times of the scientific journals was 1 575 200, an increase of 212.09% over the 2015 count, and 86.89% over 2018. The average number of total citations per journal was 457.24, representing a 136.35% increase over 2015 and a 63.73% increase over 2018.

For the Chinese-language scientific journals, the number of international total cited times was 692 600, which was 128.31% higher than 2015, and 44.71% higher than 2018. The average number of international citations per journal was 224.15, representing a 77.04% increase from 2015 and a 29.72% increase from 2018.

For the English-language STM journals, the total number of international citations was 882 600, which was 338.29% higher than in 2015 and 142.33% higher than in 2018. The average of international total cited times per journal was 2486.15, an increase of 162.98% compared with 2015 and 69.29% compared with 2018 (table 2.6).

TAB. 2.5 – Self-citation rate of China's scientific journals reported by the Annual Report.

Language	Statistical year	No. of journals	Average self-citation rate/%	Self-citation rate/%											
				0∼		10∼		20∼		30∼		40∼		50∼	
				No. of journals	%	No. of journals	%	No. of journals	%	No. of journals	%	No. of journals	%	No. of journals	%
Chinese	2015	3313	10.55	1900	57.35	929	28.04	342	10.32	94	2.84	35	1.06	13	0.39
	2018	3410	10.22	1986	58.24	998	29.27	298	8.74	94	2.76	21	0.62	13	0.38
	2021	3544	10.41	1989	56.12	1116	31.49	315	8.89	92	2.60	26	0.73	6	0.17
English	2015	200	17.74	62	31.00	75	37.50	29	14.50	17	8.50	10	5.00	7	3.50
	2018	237	18.35	70	29.54	81	34.18	36	15.19	33	13.92	8	3.38	9	3.80
	2021	277	18.91	88	31.77	78	28.16	41	18.41	31	11.19	21	7.58	8	2.89

Note: The data source is from the *Impact Factor Annual Report* 2016, 2019, and 2022 editions.

TAB. 2.6 – International citation of China's scientific journals published by the *International Citation Annual Report*.

Statistical year	No. of journals	Total intl cited times	Average total intl cited times per journal	Chinese-language Scientific journals			English-language Scientific journals		
				No. of journals	Total intl cited times	Average total intl cited times per journal	No. of journal	Total intl cited times	Average total intl cited times per journal
2015	2609	504 732	193.46	2396	303 363	126.61	213	201 369	945.39
2018	3018	842 835	279.27	2770	478 628	172.79	248	364 207	1468.58
2021	3445	1 575 200	457.24	3090	692 618	224.15	355	882 582	2486.15

Note: Data comes from the *International Citation Annual Report* 2016, 2019, and 2022 editions.

The journal selection criteria: (1) Total non-self-citation frequency $\geq$10 from international sources; (2) International non-self-citation impact factor $>$0.

2.4.1.2 Impact Factor and Immediacy Index

According to the International Citation Annual Report, the international citation impact factor per journal of China's STM journals in 2021 was 0.521, representing a 300.77% increase from 2015 and a 140.09% increase from 2018. The international citation immediacy index per journal was 0.132, an increase of 388.89% over 2015 and 131.58% over 2018.

The average international citation impact factor of Chinese-language STM journals for the statistical year 2021 was 0.094, representing a 147.37% increase over 2015 and a 67.86% increase over 2018. The average international citation immediacy index was 0.023, an increase of 360.00 % over 2015 and 130.00% over 2018.

The average international citation impact factor of English-language STM journals for the statistical year 2021 was 4.233, which was 263.97% higher than that of 2015 and 109.55% higher than that of 2018. The average international citation immediacy index was 1.089, representing a 291.73% increase compared to 2015 and a 90.05% increase compared to 2018 (table 2.7).

2.4.2 Performance Reflected by WJCI

The *WJCI Report 2022* covered a total of 1545 STM journals (including 1220 Chinese-language scientific journals and 325 English-language scientific journals). The average number of total cited times per journal was 2084.60, the average impact factor per journal was 1.732, and the average WJCI per journal was 1.367.

2.4.2.1 Distribution of Disciplines

According to the *WJCI Report 2022*, there were 46 secondary disciplines, and China's scientific journals covered a total of 45 disciplines with the exception of History of Science, for which there were no journals. The top three disciplines with the highest number of journals were Clinical Medicine (182), Earth Sciences (145), and Biology (97).

The top three disciplines with the highest number of Chinese-language STM journals were Clinical Medicine (146), Earth Sciences (113), and Agronomy (77). The top three disciplines with the highest total cited frequency were Earth Sciences (113 titles, 318 371 times), Agriculture (77 titles, 201 903 times), and Clinical Medicine (146 titles, 158 315 times). The top three disciplines with the highest total cited frequency per journal were Traditional Chinese Medicine & Pharmacology (16 titles, 4664.38 times), Food Science and Technology (20 titles, 3979.35 times), and Energy Science and Technology (38 titles, 3745.00 times). The top three disciplines with the highest average impact factor per journal were Energy Science and Technology (38 titles, 1.971), Mining Science and Technology (58 titles, 1.803), and Instrumentation Technology (5 titles, 1.557) (table 2.8).

The top three disciplines with the highest number of English-language scientific journals were Biology (40), Clinical Medicine (36), and Earth Science (32). The top three disciplines with the highest total cited frequency were Materials Science (29 titles, 146 554 times), Biology (40 titles, 145 214 times), and Physics (22 titles, 104 243 times). The top three disciplines with the highest total cited times per journal were Chemistry (14 titles, 7275.57 times), Metallurgical Engineering and Technology (8 titles, 5605.75 times), and Science and Technology in General (7 titles, 5345.57 times). The top three disciplines with

Tab. 2.7 – International citation impact factor and immediacy index of China's scientific journals published by the *International Citation Annual Report.*

Statistical year	No. of journals	Average Intl citation impact factor	Average Intl citation immediacy index	Chinese-language scientific journals			English-language scientific journals		
				No. of journals	Average Intl citation impact factor per journal	Average Intl citation immediacy index per journal	No. of journals	Average Intl citation impact factor per journal	Average Intl citation immediacy index per journal
2015	2609	0.130	0.027	2396	0.038	0.005	213	1.163	0.278
2018	3018	0.217	0.057	2770	0.056	0.010	248	2.020	0.573
2021	3445	0.521	0.132	3090	0.094	0.023	355	4.233	1.089

Note: Data comes from the *International Citation Annual Report* 2016, 2019, and 2022 editions.
The journal selection criteria: (1) Total non-self-citation frequency ≥10 from international sources; (2) International non-self-citation impact factor >0.

Tab. 2.8 – The number of China's scientific journals in various secondary disciplines published in the *WJCI Report 2022.*

No.	Discipline	No. of journals	Chinese-language STM journals				English-language STM journals			
			No. of journals	Total cited times	Total cited times per journal	Impact factor per journal	No. of journals	Total cited times	Total cited times per journal	Impact factor per journal
1	Clinical Medicine	182	146	158 315	1084.35	0.721	36	55 348	1537.44	5.476
2	Earth Sciences	145	113	318 371	2817.44	1.527	32	70 973	2217.91	2.499
3	Biology	97	57	148 749	2609.63	1.072	40	145 214	3630.35	6.377
4	Agronomy	91	77	201 903	2622.12	1.300	14	30 196	2156.86	4.885
5	Material Sciences	89	60	102 184	1703.07	0.881	29	146 554	5053.59	6.085
6	Mining Engineering Technology	65	58	135 631	2338.47	1.803	7	15 330	2190.00	3.794

Tab. 2.8 – (continued).

No.	Discipline	No. of journals	Chinese-language STM journals				English-language STM journals			
			No. of journals	Total cited times	Total cited times per journal	Impact factor per journal	No. of journals	Total cited times	Total cited times per journal	Impact factor per journal
7	Environmental and Resource Science and Technology	63	45	143 980	3199.56	1.383	18	46 145	2563.61	4.701
8	Electronics, Telecommunications	62	50	60 783	1215.66	0.806	12	13 206	1100.50	3.069
9	Chemical Engineering	61	53	83 066	1567.28	0.846	8	35 613	4451.63	4.408
10	Science & Technology in General	61	54	62 720	1161.48	0.691	7	37 419	5345.57	7.749
11	Computer Science and Technology	54	41	78 538	1915.56	1.200	13	13 767	1059.00	4.604
12	Energy Science and Technology	53	38	142 310	3745.00	1.971	15	38 984	2598.93	5.971
13	Basic Medicine	53	41	73 571	1794.41	0.755	12	36 829	3069.08	4.527
14	Physics	51	29	46 389	1599.62	0.775	22	104 243	4738.32	5.245
15	Power and Electrical Engineering	51	43	130 263	3029.37	1.306	8	10 516	1314.50	3.075
16	Chemistry	48	34	53 802	1582.41	1.096	14	101 858	7275.57	7.627
17	Transportation Engineering	42	37	50 858	1374.54	0.833	5	2834	566.80	2.662
18	Civil Engineering	40	34	81 929	2409.68	0.949	6	6912	1152.00	2.393

Tab. 2.8 – (continued).

19	Engineering General Technology and Basic Disciplines	40	35	97 239	2778.26	1.231	5	8407	1681.40	7.608
20	Engineering in General	37	31	47 704	1538.84	0.826	6	13 512	2252.00	5.742
21	Mechanical Engineering	37	32	62 074	1939.81	0.767	5	8110	1622.00	2.720
22	Information and Systems Science Related Engineering and Technology	36	26	55 565	2137.12	1.082	10	15 461	1546.10	3.464
23	Mathematics	36	14	4409	314.93	0.331	22	15 679	712.68	1.006
24	Preventive Medicine and Public Health	36	31	49 384	1593.03	0.928	5	10 845	2169.00	5.918
25	Aviation, Aerospace Science, and Technology	36	33	37 063	1123.12	0.776	3	7100	2366.67	2.790
26	Natural Science & Engineering Technology in General	34	19	58 928	3101.47	1.031	15	52 192	3479.47	7.824
27	Hydraulic Engineering	29	26	49 571	1906.58	1.303	3	6240	2080.00	3.274
28	Medicine in General	28	24	27 582	1149.25	0.567	4	17 988	4497.00	4.895
29	Pharmacy	26	21	34 788	1656.57	0.654	5	16 514	3302.80	7.686
30	Metallurgical Engineering Technology	25	17	18 703	1100.18	0.853	8	44 846	5605.75	4.284

Tab. 2.8 – (continued).

No.	Discipline	No. of journals	Chinese-language STM journals				English-language STM journals			
			No. of journals	Total cited times	Total cited times per journal	Impact factor per journal	No. of journals	Total cited times	Total cited times per journal	Impact factor per journal
31	Traditional Chinese Medicine & Herbalism	24	16	74 630	4664.38	1.091	8	11 046	1380.75	1.897
32	Animal Husbandry, Veterinary Science	23	21	43 177	2056.05	0.974	2	7091	3545.50	5.696
33	Mechanics	22	16	16 730	1045.63	1.029	6	16 536	2756.00	2.903
34	Food Science & Technology	22	20	79 587	3979.35	1.173	2	2542	1271.00	5.257
35	Forestry	20	18	32 539	1807.72	1.282	2	5100	2550.00	2.812
36	Surveying and Mapping	18	16	30 373	1898.31	1.470	2	1719	859.50	2.438
37	Safety Science & Technology	14	12	22 234	1852.83	1.017	2	1530	765.00	3.156
38	Nuclear Science & Technology	13	10	5791	579.10	0.352	3	2955	985.00	2.937
39	Aquaculture	13	12	15 834	1319.50	1.030	1	693	693.00	4.845
40	Textile Science &Technology	11	11	8617	783.36	0.465	–	–	–	–
41	Information and System Science	10	5	5888	1177.60	0.698	5	9033	1806.60	2.039
42	Astronomy	8	5	2098	419.60	0.628	3	7497	2499.00	3.374
43	Instrument and Meter Engineering	7	5	15 536	3107.20	1.557	2	460	230.00	1.427

Tab. 2.8 – (continued).

44	Special Medicine and Forensics	6	6	2855	475.83	0.407	–	–	–	–
45	Psychology	3	3	7880	2626.67	0.892	–	–	–	–
	Total	1545	1220	2 353 438	1929.05	1.020	325	867 265	2668.51	4.403

Note: The data was sourced from the *WJCI Report 2022* and sorted in descending order by the total number of Chinese-language plus English-language journals indexed.

Some journals belong to two or more disciplines. The aggregated data has been deduplicated.

the highest average impact factor per journal were Engineering and Technology related to Natural Sciences (15 titles, 7.824), Science and technology in general (7 titles, 7.749), and Pharmacy (5 titles, 7.686) (table 2.8).

2.4.2.2 Analysis of the Impact Indexes

According to the statistics in the WJCI Report, the total number of cited times of Chinese-language STM journals in the 2021 statistical year was 2 353 400, representing a 32.69% increase compared to the 2019 statistical year. The average citation per journal was 1929.05 times, representing a 21.71% increase compared to the 2019 statistical year. The average impact factor was 1.020, representing a 39.15% increase compared to the 2019 statistical year. The average WJCI was 1.046, representing an 8.73% increase compared to the 2019 statistical year (table 2.9).

Tab. 2.9 – Impact of China's scientific journals reported by the *WJCI Report*.

Languages	Statistical year	No. of journals	Total cited times	Citation per journal	Impact factor per journal	WJCI per journal	WAJCI per journal	WI per journal
Chinese	2019	1119	1 773 620	1585.00	0.733	0.962	0.858	0.104
	2020	1218	2 189 054	1797.25	0.876	1.097	0.939	0.158
	2021	1220	2 353 438	1929.05	1.020	1.046	0.884	0.162
English	2019	255	500 904	1964.33	2.764	2.257	2.165	0.092
	2020	277	597 568	2157.29	3.205	2.324	2.064	0.260
	2021	325	867 265	2668.51	4.403	2.574	2.321	0.253

Note: The data source is the *WJCI Report* 2020 to 2022 editions.

The number of total cited times of English-language STM journals in the statistical year 2021 was 867 300, which was 73.14% higher than that of 2019. The average total citations per journal rose to 2668.51, which was 35.85% higher than the previous year of 2019. The average impact factor per journal was 4.403, which was 59.30% higher than that of 2019. And the average WJCI per journal was 2.574, which was 14.05% higher than that of 2019 (table 2.9).

2.4.2.3 International Rankings by WJCI

According to the *WJCI Report*, the average WJCI value by country reveals the overall impact level of the country's journals. In the 2021 statistical year, the Netherlands ranked first in average WJCI index, followed by the United Kingdom, the United States, and Switzerland (figure 2.1). The Netherlands had 1114 journals with an average WJCI index of 3.093; China ranked 9th globally, with an average WJCI of 1.399 across 1635 journals (table 2.10).

In the *WJCI Report 2022*, countries with 50 or more source journals were listed. Sorted in descending order by the national WJCI average according to the *WJCI Report 2022*.

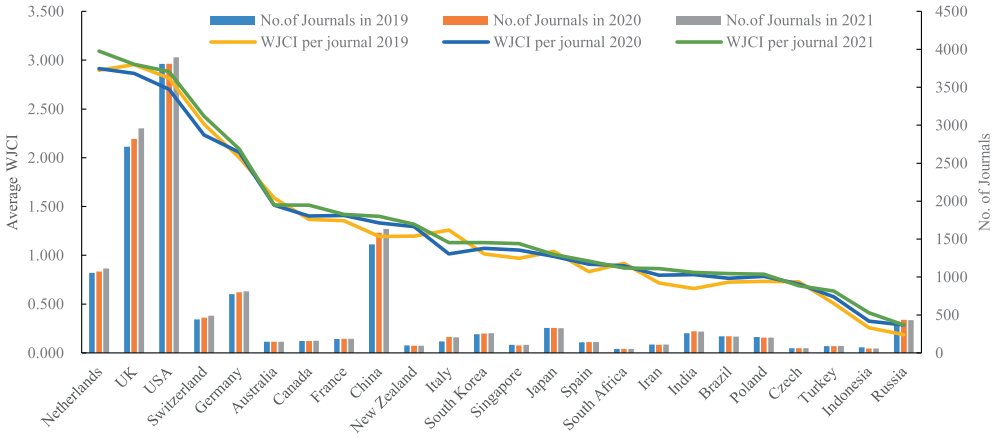

FIG. 2.1 – Changes in the WJCI Index of scientific journals from various countries in the *WJCI Report* from 2020 to 2022 editions.

2.4.3 China's Scientific Journals Indexed in International Databases

With the rapid development of science and technology in China, the status and role of China's scientific journals in international academic exchanges are becoming increasingly evident, and an increasing number of journals are being included in internationally renowned databases, according to statistics from two comprehensive citation databases—WoS and Scopus—as well as six subject-specific international abstract and indexing databases including EI for Engineering Technology, PubMed for Biomedicine, Chemical Abstracts-ACS for Chemistry, MathSciNet-MSN for Mathematics, GeoRef for Earth Sciences, and CAB Abstracts for Agriculture, a total of 2066 China's STM journals were indexed by at least one of these databases as of September 2023. Among them, 386 English-language journals from China were indexed internationally, accounting for 88.94% of the country's total English-language journal output (434 titles). The number of China's English-language STM journals indexed in international databases is detailed in table 2.11. Compared with the same period last year, these databases have newly indexed 35 additional English-language STM journals from China. The complete list of newly included journals is detailed in table 2.12.

Tab. 2.10 – Global WJCI index statistics for scientific journals by country from the *WJCI Report* (2020–2022 Editions).

No.	Country	2019 statistical year				2020 statistical year				2021 statistical year			
		No. of journals	WJCI per journal	WAJCI per journal	WI per journal	No. of journals	WJCI per journal	WAJCI per journal	WI per journal	No. of journals	WJCI per journal	WAJCI per journal	WI per journal
1	Netherlands	1054	2.899	2.641	0.258	1071	2.915	2.461	0.454	1114	3.093	2.626	0.467
2	UK	2717	2.954	2.546	0.408	2818	2.864	2.363	0.501	2958	2.957	2.444	0.512
3	USA	3806	2.816	2.472	0.345	3812	2.703	2.310	0.393	3896	2.883	2.471	0.412
4	Switzerland	443	2.345	1.995	0.350	462	2.234	1.791	0.444	489	2.428	1.879	0.549
5	Germany	774	2.002	1.785	0.217	800	2.054	1.722	0.332	811	2.088	1.735	0.353
6	Australia	146	1.588	1.308	0.280	146	1.513	1.206	0.306	147	1.517	1.236	0.281
7	Canada	156	1.370	1.176	0.194	157	1.404	1.145	0.259	159	1.513	1.250	0.263
8	France	183	1.355	1.209	0.146	185	1.408	1.195	0.213	186	1.419	1.221	0.199
9	China	1431	1.192	1.090	0.103	1584	1.332	1.156	0.176	1635	1.399	1.221	0.178
10	New Zealand	99	1.196	1.031	0.165	94	1.296	1.121	0.175	96	1.318	1.084	0.235
11	Italy	150	1.257	1.111	0.147	208	1.014	0.856	0.158	206	1.131	0.957	0.174
12	ROK	245	1.013	0.972	0.041	257	1.071	0.970	0.101	259	1.130	1.036	0.094
13	Singapore	105	0.969	0.942	0.026	100	1.054	0.965	0.090	106	1.120	1.023	0.097
14	Japan	329	1.040	0.955	0.084	330	0.990	0.835	0.156	323	1.008	0.843	0.165
15	Spain	137	0.834	0.730	0.104	142	0.909	0.744	0.165	141	0.940	0.767	0.173
16	South Africa	51	0.917	0.845	0.071	51	0.893	0.764	0.128	52	0.870	0.732	0.137
17	Iran	108	0.717	0.686	0.032	107	0.796	0.744	0.052	108	0.864	0.808	0.055
18	India	260	0.661	0.593	0.068	285	0.802	0.702	0.100	281	0.824	0.715	0.109
19	Brazil	220	0.724	0.684	0.040	218	0.764	0.696	0.068	215	0.813	0.749	0.064
20	Poland	207	0.734	0.697	0.037	201	0.784	0.712	0.072	202	0.807	0.727	0.080
21	Czech	63	0.729	0.719	0.010	63	0.706	0.645	0.061	63	0.687	0.625	0.063
22	Turkey	89	0.507	0.477	0.030	88	0.575	0.527	0.048	90	0.635	0.586	0.049
23	Indonesia	72	0.256	0.256	0.001	59	0.324	0.315	0.009	59	0.410	0.399	0.011
24	Russia	414	0.185	0.181	0.005	433	0.285	0.268	0.017	431	0.285	0.263	0.022

Note: The data was sourced from *the WJCI Report* (2020–2022 Editions).

For interdisciplinary journals, the maximum WJCI value was adopted.

In the *WJCI Report (2022 Edition)*, the countries with 50 or more source journals were listed in the table. Sorted in descending order by the national WJCI average according to the *WJCI Report (2022 Edition)*. For cross-country/region comparisons, the country/region attribution of journals was determined by their ISSN-registered country/region. China's journals include both those with CN numbers and those registered in China through the ISSN system.

Tab. 2.11 – China's English-language STM journals indexed in the international databases, 2022–2023.

No.	Databases	Discipline	No. of journals indexed	
			2022	2023
1	WoS	General	273	298
2	Scopus	General	295	357
3	EI	Engineering Technology	120	135
4	PubMed	Biology and Medicine	72	88
5	ACS	Chemistry	196	209
6	CAB Abstracts	Agronomy	65	73
7	GeoRef	Earth Sciences	38	43
8	MSN	Mathematics	30	30

Tab. 2.12 – China's English language STM journals newly indexed by international databases in 2023.

No.	Title in English	Title in Chinese	Newly indexed databases
1	*BioDesign Research*	生物设计研究 (英文)	Scopus, ACS, CAB Abstracts
2	*Blockchain: Research and Applications*	区块链研究 (英文)	WoS, Scopus, EI
3	*Blood Science*	血液科学 (英文)	WoS, Scopus, PubMed
4	*Cardiology Discovery*	心血管病探索 (英文)	Scopus
5	*CES Transactions on Electrical Machines and Systems*	中国电工技术学会电机与系统学报 (英文)	Scopus
6	*ChemPhysMater*	化学物理材料 (英文)	Scopus
7	*China Detergent & Cosmetics*	日用化学品科学 (英文)	ACS
8	*Chinese Journal of Plastic and Reconstructive Surgery*	中国整形与重建外科 (英文)	Scopus
9	*Chinese Medicine and Culture*	中医药文化 (英文)	Scopus
10	*Complex System Modeling and Simulation*	复杂系统建模与仿真 (英文)	Scopus
11	*Corrosion Communications*	腐蚀学报 (英文)	Scopus
12	*Cyborg and Bionic Systems*	类生命系统 (英文)	WoS, PubMed, ACS
13	*Earthquake Research in China*	地震研究进展 (英文)	GeoRef
14	*Emergency and Critical Care Medicine*	急危重症医学 (英文)	Scopus
15	*eScience*	电化学与能源科学 (英文)	Scopus
16	*Global Health Journal*	全球健康杂志 (英文)	Scopus

Tab. 2.12 – (continued).

No.	Title in English	Title in Chinese	Newly indexed databases
17	*Grassland Research*	草地研究 (英文)	Scopus
18	*Green Chemical Engineering*	绿色化学工程 (英文)	Scopus, EI
19	*Health Data Science*	健康数据科学 (英文)	Scopus, CAB Abstracts
20	*Infectious Diseases & Immunity*	感染性疾病与免疫 (英文)	Scopus
21	*Infectious Medicine*	感染医学 (英文)	Scopus
22	*Intelligent Medicine*	智慧医学 (英文)	Scopus
23	*Journal of Bio-X Research*	生物组学研究杂志 (英文)	Scopus
24	*Journal of Intensive Medicine*	重症医学 (英文)	Scopus, PubMed, ACS
25	*Journal of Remote Sensing*	国际遥感学报 (英文)	CAB Abstracts
26	*Journal of Safety Science and Resilience*	安全科学与韧性 (英文)	Scopus, EI
27	*Journal of the National Cancer Center*	癌症科学进展 (英文)	Scopus
28	*Laparoscopic, Endoscopic and Robotic Surgery*	腔镜、内镜与机器人外科 (英文)	Scopus
29	*Magnetic Resonance Letters*	磁共振快报 (英文)	ACS
30	*mLife*	微生物 (英文)	ACS
31	*npj flexible electronics*	柔性电子 (英文)	WoS, Scopus, ACS
32	*Rare Metal Materials and Engineering*	稀有金属材料与工程 (英文版)	WoS
33	*Rheumatology & Autoimmunity*	风湿病与自身免疫 (英文)	WoS, Scopus, ACS
34	*Space: Science & Technology*	空间科学与技术 (英文)	WoS, ACS
35	*Tungsten*	钨科技 (英文)	WoS, Scopus, EI

Chapter 3

Current Situation of China's Popular Science Journals

Tieming ZHANG, Xiawen WEI and Yehua ZHU

Abstract

General Characteristics of China's Popular Science Journals

By the end of 2022, 257 popular science journals had been published on the Chinese mainland, accounting for 4.98% of the total number of scientific journals. Key characteristics are summarized below: (A) The publishing resources for popular science journals are relatively scattered and homogeneous. Apart from the 99 state-level journals, the remaining popular science journals are distributed across 28 provincial-level regions. (B) From the perspective of distribution by discipline, popular science journals cover quite a wide range of disciplines but show uneven coverage. Specifically, journals focusing on medical and health sciences account for 22.96%, industrial technology for 19.84%, and general natural sciences for 19.46% of the total. (C) In terms of supervisors and sponsors, the most significant number of popular science journals are supervised by local government agencies and publishing organizations, accounting for 21.78% and 21.01% of the total, respectively. Most popular science journals are sponsored by a single unit, accounting for 86.38% of the total. The major sponsoring institutions of popular science journals include professional publishing units (39.30%), universities and research institutes (21.40%), as well as national and local learned societies (20.23%). (D) The popular science journal industry employs a total of 3017 professionals, with an average of 11.74 staff members per journal. Among them, 1509 work in editorial roles, accounting for 50.01% of the total workforce. (E) Chinese-language journals are the leading journals compared with other languages. The publication cycle is dominated by monthly magazines (131 journals, accounting for 50.97%), followed by semi-monthly magazines (40 journals, accounting for 15.56%).

Current Situation of Popular Science Journals Publishing and Operation in China

Among the 253 popular science journals that submitted valid data for this survey, half (50%) were published by independent, legally established publishing units. Regarding the

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breakdown of publishing entity types, there were 94 journals (37.15%) published by enterprise legal entities, 40 journals (15.81%) published by institutional legal entities, and 116 journals (45.85%) published by non-legal entities.

Among the 250 journals reporting circulation methods, the majority (70.47%) adopted postal distribution and self-operated distribution as their primary methods. In 2022, the total circulation reached 5 381 100 copies, with 84.80% of journals having a circulation of less than 30 000 copies each.

Within the 243 journals that submitted valid data for overall income, China's popular science journals demonstrated a polarized pattern. In general, the sector primarily operates on self-sustaining models, with three main revenue approaches: circulation-driven, advertising-driven, and other business-driven. Regarding the revenue distribution, the high-revenue tier with the gross annual income over 10 million yuan constituted of 19 journals, accounting for 7.82%; there were 127 journals (52.26%) in the mid-revenue tier which fell in the income range from 1 to 10 million yuan; the remaining 97 journals (39.92%) were in the low-income tier below 1 million yuan.

New Media Communication Capacity and Effectiveness of Popular Science Journals in China

An increasing number of popular science journals are recognizing and harnessing the power of new media platforms. By launching video channels and establishing presences on short-video platforms like Bilibili, Douyin, and Kuaishou, these journals are creating new pathways to dominate online science communication.

WeChat Official Accounts metrics for popular science journals: According to Qingbo Index (China's leading new media analytics), 219 out of 257 popular science journals (85.21%) operated WeChat Official Accounts. Among these, 134 maintained consistent updates for three consecutive months, which accounts for 61.19%. The WeChat Communication Index (WCI) of these 134 Official Accounts achieved an average of 451, with 57 accounts surpassing this average, accounting for 42.54%.

Popular science journal WeChat Channels metrics: 75 popular science journals have launched WeChat Channels, accounting for 29.18%. In general, the activity level of popular science journal WeChat Channels remained relatively low.

Douyin accounts: A total of 84 journals (32.68% of the surveyed) have established official Douyin accounts.

Bilibili accounts: 41 journals (15.95% adoption rate) maintained official Bilibili accounts. These 41 journals cover natural sciences, medicine and health, automobiles, computers, home design, photography, and other categories, as well as popular science journals for youth and children.

Popular science journals serve as a vital medium for science popularization, which play an irreplaceable role in disseminating scientific knowledge, promoting scientific literacy, preserving the spirit of scientific inquiry, and inspiring scientific aspirations. Historical data from civic scientific literacy consistently demonstrate that popular science journals serve as a key channel for public access to scientific information, a critical platform for popularizing scientific knowledge, promoting standardized methodologies, disseminating scientific

thinking, and advocating scientific ethos. As a core component of China's science popularization ecosystem, popular science journals play a vital role in stimulating scientific curiosity, promoting access to scientific knowledge, disseminating scientific methodologies, and upholding the scientific ethos and research ethics. Innovating dissemination approaches and enhancing scientific communication effectiveness have become a key issue of social concern. Advancing the science popularization will help improve civic scientific literacy, form an atmosphere for science dissemination, and ignite public innovation potential.

3.1 General Introduction of China's Popular Science Journals

Science popularization refers to the dissemination of scientific and technological knowledge. In 2002, the *Law of the People's Republic of China on Popularization of Science and Technology* was promulgated, which stipulates that popular science is an activity to "popularize scientific and technological knowledge, promote scientific approaches, disseminate scientific ideas and carry forward scientific spirit". Hence, popular science journals aim to popularize scientific and technological knowledge, promote the application of science and technology, advocate scientific methodologies, disseminate scientific thinking, and carry forward the scientific spirit.

The *Blue Book on China's Scientific Journal Development, 2017 and 2020 editions*, also define the scope of popular science journals as informal science education reading materials for the public. Popular science journals can be classified into those for the general public and those for scientific and technical workers. Additionally, according to their content focus, these journals can be categorized into general popular science journals and specialized popular science journals. General popular science journals primarily publish comprehensive content that spans the natural sciences and encompasses encyclopedic knowledge. Specialized ones focus more on discipline-specific topics, including physical sciences, engineering, agriculture, medicine, children's science education, and military, public safety, and firefighting sciences. Due to the increasing depth of their content, some high-level specialized popular science journals are now also classified as scientific journals in their development trajectory.

Based on screening 5163 journals that participated in the 2022 annual inspection, by the end of 2022, the Chinese mainland had 257 publicly published popular science journals, accounting for 4.98% of the nation's total scientific journal output.

In recent years, with the evolving focus of many scientific journals, some originally advanced popular science journals have been reclassified as academic journals by the former State Administration of Press, Publication, Radio, Film and Television (SAPPRFT) and are no longer counted as popular science journals in this book. Since this book's research scope is limited to scientific journals, popular science journals that fall outside the scientific category have also been excluded from the statistics. After filtering based on the aforementioned concept and principle, 257 popular science journals are included in the statistics.

Based on the statistics, China's popular science journals show the following key trends: first, a geographically dispersed distribution; second, predominance of self-sustaining business models; third, limited workforce scale; fourth, a clear trend of adopting new media platforms. Since 2012, high-quality development has become the theme of economic and social development in the new era. The gradual improvement in civic scientific literacy and

technology-driven media convergence has also brought new opportunities and challenges to the development of popular science journals.

Currently, the overall number of popular science journals in China has stabilized, while their quality and standards are steadily improving. The sector demonstrates sustained growth in several key areas: editorial teams, advertising operations, brand promotion, and new media communication.

3.1.1 Basic Situation

Based on the content and conceptual definition of popular science journals, and according to the 2022 annual inspection data of scientific journals, the research team selected a total of 257 journals after a few rounds of screening. The primary benchmarks for inclusion are: first, the journal title must contain explicit science-related terminology (*e.g.*, "Science") or demonstrate clear popular science intent, *e.g.*, *Science Pictorial* and *Science World*, etc.; secondly, the aim of the journal, which explicitly indicates commitment to science popularization in editorial policies; the third is the target audience, which means the journal content is for the general public. For journals that were difficult to evaluate against the aforementioned three benchmarks, the team identified popular science journals through additional search methods, including online database searches and print journal queries, to select those with content primarily aimed at popularizing scientific and technological knowledge to the public. At the same time, the team also referred to the list of popular science journals selected by the China Science Writers Association.

The publishing resources for China's popular science journals are relatively scattered and homogeneous. By the end of 2022, China's popular science journals demonstrated stable quantity, broad disciplinary coverage, extensive geographical distribution, and a predominance of specialized industry-focused publications. Apart from the 99 state-level journals, the remaining popular science journals were distributed across 28 provincial-level regions. Higher concentrations existed in centrally administered municipalities (Beijing, Shanghai, Chongqing, and Tianjin), as well as in provinces like Guangdong and Hunan. Provinces and autonomous regions such as Fujian, Gansu, Guizhou, and Inner Mongolia had relatively few popular science journals. Qinghai, Xizang, and Ningxia did not have popular science journals (figure 3.1).

3.1.1.1 Classification and Distribution by Discipline

China's popular science journals span 34 disciplines, with the top three disciplines — agricultural sciences, general natural sciences, and medicine & health sciences — collectively representing 53.31% of all journals. While covering a broad academic spectrum, their distribution shows a significant imbalance. According to the Chinese Library Classification System, popular science journals cover the following subject categories: general natural science (code "N"), mathematics, physics & chemistry (O), astronomy and earth sciences (P), biological sciences (Q), medicine & health (R), agriculture sciences (S), industrial technology (T), transportation (U), aeronautics & astronautics (V), environmental & safety sciences (X), and comprehensive field (Z). Among them, popular science journals in medicine & health, industrial technology, and general natural science account for 22.96%, 19.84%, and 19.46% respectively (figure 3.2).

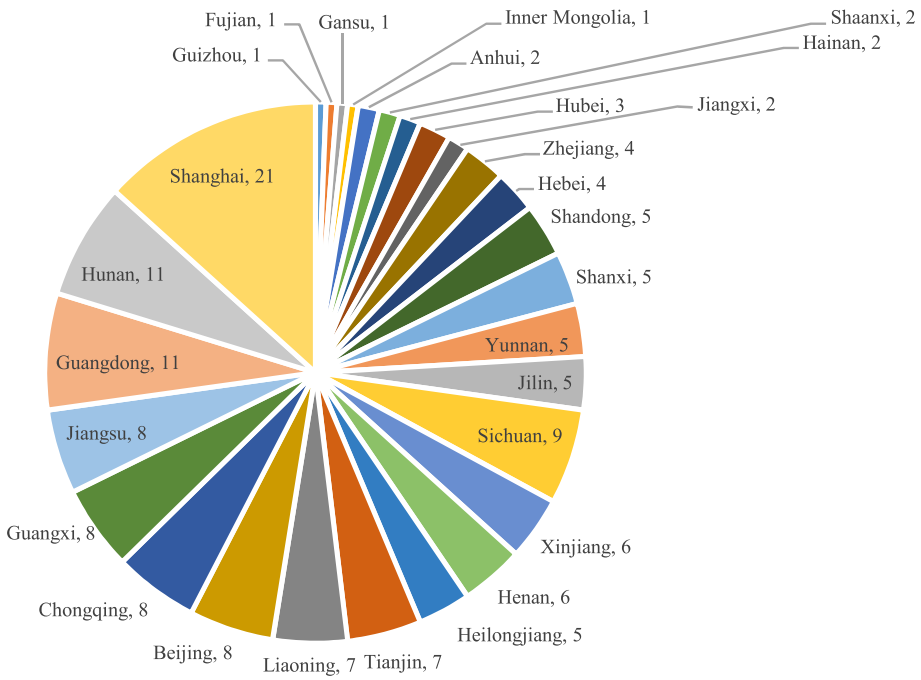

FIG. 3.1 – Geographical distribution of China's popular science journals (excluding 99 state-level journals) in 2022.

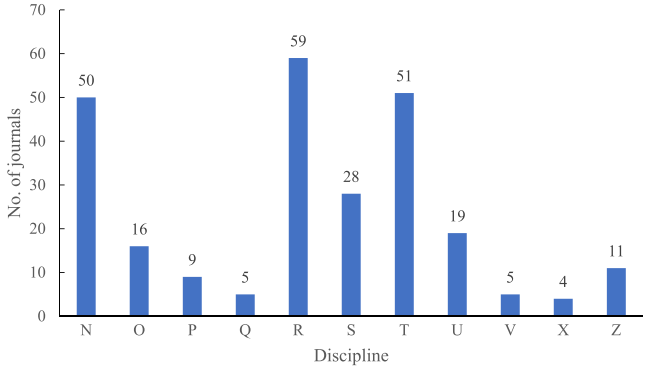

FIG. 3.2 – Distribution by discipline of popular science journals in 2022.
Note: N: General natural science general introduction, O: Physical science & chemistry, P: Astronomy, earth sciences, Q: Biological science, R: Medical, pharmaceutical & health science, S: Agricultural sciences, T: Industrial technology, U: Transportation, V: Aeronautics & astronautics, X: Environmental science, safety science, and Z: Comprehensive field.

3.1.1.2 Distribution by Supervising and Sponsoring Units

The supervising units of China's popular science journals comprise local government agencies, CAST and its regional branches, national ministries and commissions, publishing organizations, universities and research institutes, enterprises, and national social organizations. Statistics (table 3.1) reveal that local government agencies and publishing organizations constitute the two largest supervising bodies, accounting for 21.78% and 21.01% of the total, respectively. Most popular science journals are sponsored by one unit, accounting for 86.38% of the total, while some journals have two or more sponsors. Sponsors of popular science journals in China mainly include professional publishing organizations, universities and research institutes, national or local societies, relevant government departments or agencies, CAST and its regional branches, enterprises, hospitals, and so on. The top three sponsors are professional publishing organizations (39.30%), universities and research institutes (21.40%), and national and local societies (20.23%).

Tab. 3.1 – Distribution of supervisors for popular science journals.

Supervising unit	No. of journals	%
Local government agencies	56	21.78
National ministries and commissions	41	15.95
Publishing organizations	54	21.01
Universities and research institutes	27	10.50
CAST	31	12.06
Enterprises	18	7.01
Regional branches of CAST	14	5.44
National social organizations	14	5.44
Others	2	0.81
Total	257	100.00

3.1.1.3 Distribution by the Journal Publishing Team

Based on the 2022 annual inspection statistics, the 257 popular science journals employed about 3107 professionals, with an average of 11.74 staff members per journal. Among them, 1509 work in editorial roles, accounting for 50.02% of the total workforce; the number of administrative staff is about 360, accounting for 11.93% of the total; the number of advertisement and distribution staff is about 574, accounting for 19.03% of the total; the number of new media staff is about 36, accounting for 1.19% of the total number of staff.

Regarding educational background, staff holding master's degrees or higher totaled 730 (24.20%), while 1846 held bachelor's degrees (61.19%). The number of staff with associate senior professional titles or higher is 371, accounting for 12.30%. With the continuous development of popular science journals in China, the demand for highly educated talents in publishing organizations is also increasing, and the proportion of highly educated personnel will further increase in the future. Simultaneously, although popular science journals are actively embracing new media, the proportion of new media personnel is still relatively small, which should be expanded in the future.

3.1.1.4 Distribution by Language and Publication Frequency

China's popular science journals are mainly in Chinese. To meet the needs of diverse regions, predominantly ethnic minority areas, some popular science journals are published in ethnic minority languages. Statistics show that six popular science journals (2.33%) are currently published in minority languages in China, which are two in Kazakh and four in Uighur popular science journals.

Compared with academic journals, popular science journals have a faster publication frequency. In terms of publication frequency, China's popular science journals were mainly published monthly, with a total of 131, accounting for 50.97%. This was followed by semi-monthly journals, with a total of 40, accounting for 15.56%. There was only one semi-annual journal, and no yearly journal for the time being.

3.1.1.5 Development of New Media

The discovery and application of new media are at the essence of the development and innovation of popular science journals. The *National Action Plan for Improving Public Scientific Literacy (2021–2035)* identifies the large-scale development of short videos and other innovative formats as a key pathway for supply-side reform in science communication. As early as the rise of social media, some popular science journals began to catch up with the trend of new technology and explore cross-media diversified development. For example, in 2022, *Popular Medicine* began exploring the strategy of integrating print media with new media such as the Internet, mobile phones, and television. The short video operation and dissemination of popular science journals represented by *Chinese National Geography* and *Nature History* are directly related to the publication's operational innovation, which implies the innovation in branding, marketing promotion, and business model.

Since the beginning of the 21st century, the innovation of new technologies has accelerated new media growth. With the emergence and prosperity of new media, VR, AR, live streaming, and short videos are developing rapidly. People are no longer satisfied with Weibo (Sina blog) and WeChat. The users of platforms such as Zhihu (Chinese version of Quora), Toutiao (today's headlines), and various short-video apps were growing fast. Since then, China has issued a series of policies on media integration, such as the *Guidelines on Promoting the Integrated Development of Traditional Media and New Media*, which have extensively promoted the development of science popularization. On-demand accessibility and real-time interaction have become defining features of popular science journals in the era of media integration. However, statistics show that at present, the staff of China's STM journals working in the new media department account for only 1.19% of the total professionals. Only 62 popular science journals have allocated dedicated new media budgets, with a total investment amount of 29.107 million yuan, and a cumulative revenue of 56.048 million yuan. Proactive adoption of digital transformation is essential to enhance the comprehensive development of science communication and to ensure sustainable growth in the integrated media era.

3.1.2 Operation Status

Currently, about half of the popular science journals are published by independent legal entity publishing units and have made achievements in distribution, advertisement, and

other perspectives. Especially with the spread of new media, the efficiency of some popular science journals has risen steadily. However, most popular science journals still have problems such as small business scale and poor brand promotion.

3.1.2.1 Nature of the Publication Organizations

According to statistics in 2022, among the 253 popular science journals, more than half were independent legal entity publication organizations. Regarding the breakdown of publishing entity types, there were 94 journals (37.15%) published by enterprise legal entities; 40 journals (15.81%) by institutional legal entities; and 116 journals (45.85%) published by non-legal entities (table 3.2).

Tab. 3.2 – Nature of publication organizations of China's popular science journals in 2022.

Nature of the publishing unit	No. of journals	%
Non-legal entity	116	45.85
Enterprise legal person	94	37.15
Institutional legal person	39	15.42
Other	4	1.58
Total	253	100.00

3.1.2.2 Operation Models

Currently, the operational model of popular science journals in China is generally self-sustaining. There are three main profit models: circulation-driven, advertising-driven, and other business-driven. The main feature of the circulation-driven model of popular science journals is the high volume of circulation; the advertising-driven model is characterized by its close integration with the industry and access to rich advertising resources, such as pharmaceuticals and automobiles; journals with the other-business-driven model generate revenue mainly through diversified approaches, with new media dissemination as their core profit model.

Among the 243 popular science journals that reported valid data of total annual income, the high-revenue tier with the gross annual income over 10 million yuan constituted of 19 journals, accounting for 7.82%; there were 127 journals (52.26%) in the mid-revenue tier which fell in the income range from 1 to 10 million yuan; the remaining 97 journals (39.92%) were in the low-income tier below 1 million yuan. Among these 97 journals, *Nature History*, *Mathematics*, *Physics & Chemistry for Middle School Students*, and *Aerospace Knowledge Youth* are circulation-driven journals; *Chinese National Geography* and *Car* are advertising-driven journals, while *Car Owners* and *Popular Science* rely mainly on new media for income. The remaining 97 journals, which account for 39.92% of popular science journals, had an annual total income of 1 million yuan. This shows that the total income of popular science journals is polarized (table 3.3).

3.1.2.3 Publication and Distribution

Currently, the dominant channel for popular science journals is still the postal subscription system, with a hybrid "postal + self-operated" distribution model serving as a

TAB. 3.3 – Annual total income (G) of popular science journals in 2022.

G in 1000 yuan	No. of journals	%
$0 < G \leq 1000$	97	39.92
$1000 < G \leq 2000$	38	15.64
$2000 < G \leq 3000$	27	11.11
$3000 < G \leq 4000$	19	7.82
$4000 < G \leq 5000$	12	4.94
$5000 < G \leq 6000$	9	3.70
$6000 < G \leq 7000$	11	0.53
$7000 < G \leq 8000$	4	1.64
$8000 < G \leq 9000$	1	0.41
$9000 < G \leq 10\,000$	6	2.47
$G > 10\,000$	19	7.82
Total	243	100.00

supplementary approach. With the continuous development of China's publishing industry, especially after it acceded to the WTO, China has opened up the wholesale market for books, newspapers, and periodicals. This led to an influx of foreign distributors, intensifying competition in the publication distribution market. Consequently, all kinds of publication and distribution channels have been broadened, and distribution methods have been diversified.

Statistics show that 250 popular science journals provided valid distribution data. There were three circulation channels: post offices, self-distribution, and the hybrid "postal + self-distribution". Among these, postal + self-distribution constituted the dominant method, accounting for 70.47%. The total circulation of popular science journals in China in 2022 was 5 381 100 copies, of which 84.80% had a circulation of less than 30 000 copies (table 3.4).

TAB. 3.4 – Circulation statistics (D) of China's popular science journals in 2022.

D in 1000 copies	No. of journals	%
<30	212	84.80
30 ~	29	11.6
100 ~	6	2.4
300 ~	2	0.8
500 ~ 1000	1	0.4
Total	250	100.00

There are nine popular science journals with a distribution income of more than 10 million yuan, accounting for 3.60%; 16 journals have revenues between 5 and 10 million yuan, accounting for 6.40%; 64 journals have revenues between 1 and 5 million yuan, accounting for 25.60%. One hundred sixty-one journals have revenues below 1 million yuan, accounting for 64.40%. There are only two types of advertising revenues exceeding 10 million yuan; 1 type has revenues between 5 and 10 million yuan, accounting for 0.4%; 26

types have revenues between 1 and 5 million yuan, accounting for 10.40%; and 95 types have revenues under 1 million yuan, accounting for 38.00%. One hundred twenty-six journals (50.40%) did not report advertisement income, indicating that advertising revenue is not the main profit model for the vast majority of popular science journals.

3.1.2.4 Income from New Media and Academic Activities

With the widespread use of new media, some popular science journals have obtained good benefits through this new profit model. Statistics show that 51 journals have obtained new media income, of which six journals have a new media income of more than 5 million yuan; 8 journals have revenues between 1 and 5 million yuan. At the same time, popular science journals have carried out relevant academic activities under their brand advantages, and 59 of them have made gains from academic activities, of which 20 journals have obtained more than 1 million yuan, and another 40 have received 3.719 million yuan in copyright income, which indicates that the level of originality of China's popular science journals has been gradually improving.

3.2 New Media Communication Capability and Effectiveness of Popular Science Journals in China

With the accelerated pace of media integration, an increasing number of popular science journals are harnessing the power of digital platforms by launching video channels and establishing presences on short-video platforms like Bilibili, Douyin, and Kuaishou. These initiatives have become critical new channels for science communication in the digital space. In recent years, platforms such as WeChat Official Accounts, WeChat Channels, Douyin, and Bilibili have gained significant influence and are expanding their reach due to their distinct private-domain social recommendation algorithms. To assess this impact, we utilized Qingbo Index[1] — an authoritative big data analytics and research platform for new media — to evaluate the dissemination performance of 257 China's popular science journals across these platforms. Key metrics extracted include account penetration rates, communication power indices, and engagement benchmarks.[2]

3.2.1 Adoption Status of New Media Platforms for Popular Science Journals

According to the data extracted from the Qingbo Index, the majority of popular science journals have adopted new media operation methods. There were 219 journals among 257

[1]Qingbo Big Data is a leading Chinese authority in new media big data analytics, recognized as a key domestic provider public opinion reports and analytics software and the definitive institution for compiling internet, new media, and big data rankings in China. Qingbo Index, its flagship product, represents: China's largest third-party new media data search engine and the most comprehensive big data platform covering "Two Micros and One App" (Weibo, WeChat, and new Apps).

[2]The data in this part is based on the results of the research project of the Service Center for Societies of CAST in 2022 — "Research on Communication Ability and Communication Effect of Popular Science Journals" (2022XFKJQK04). The authors of this section of the Book are the main participants in the project.

total data, which established WeChat Official Accounts, accounting for 85.21% (table 3.5). Other types of new media platforms have seen relatively limited adoption by popular science journals due to higher access barriers and operational costs. Consequently, the development of new media platforms for science communication remains predominantly focused on text- and image-centric platforms like WeChat, while the establishment of short video platforms for science dissemination lags behind in comparison.

Tab. 3.5 – Adoption of new media platforms for popular science journals.

New media platform	No. of journals	%
WeChat Official Accounts	219	85.21
WeChat Channels	75	29.18
Douyin	84	32.68
Bilibili	41	15.95

Note: The data was extracted on June 30, 2022.
A total of 257 popular science journals reported this item of data.

3.2.2 Dissemination of Popular Science Journals on the WeChat Official Accounts

As an essential form of new media, the WeChat Official Accounts offer strong interactivity and multi-functionality; thus, popular science journals have integrated in-depth reading from print journals with light reading *via* the WeChat Official Accounts, which is conducive to the wide dissemination of popular science knowledge and is increasingly being valued by popular science journals. Using the Qingbo Index, we extracted and analyzed the communication metrics of WeChat official accounts for 257 popular science journals from May to July 2022.

3.2.2.1 Continuous Update Status

From the perspective of updates, among the 219 popular science journals that have opened WeChat Official Accounts, those maintaining monthly updates has shown an upward trend, 134 public accounts have been updated for three consecutive months, accounting for 61.19% of the total number of science journals, while 55 journals' Official Accounts had no updates for three months, accounting for 25.11% of the total.

3.2.2.2 WeChat Communication Index

The WeChat Communication Index (WCI),[3] which represents the effect and influence of WeChat communication of journals, is derived from evaluating the overall communication

[3]WeChat Communication Index (WCI) is a scalar value derived from raw data through the algorithmic formula by the GSDATA team. It evaluates four key dimensions: overall communication power, per article communication power, headline article communication power, and peak communication power. The index comprises four tier-1 indicators and 12 tier-2 indicators with different weights.

power, per article communication power, headline article communication power, and peak communication power on the Qingbo Index platform. Data were extracted from 134 science journals' WeChat Official Accounts that were updated for three consecutive months from May to July 2022 (table 3.6). The average WCI of the 134 science journals is 451, with 57 accounts (42.54%) above the average and 77 accounts (57.46%) below the average. The average WCI is mainly concentrated below 1000, with a total of 129 accounts, accounting for 96.27% of the total.

There were five WeChat Official Accounts that achieved WCI scores exceeding 1000: *Nature History* (1370.91), *Scientific American* (1354.00), *Chinese National Geography* (1342.67), *Family Doctor* (1214.47), and *Aerospace Knowledge* (1127.54). These top-performing accounts ranked highest in three key metrics: posting frequency, content volume, and per-article readership, indicating that the public accounts should maintain a high frequency and number of posts to continuously attract readers and form a virtuous cycle of communication effects.

Tab. 3.6 – Top 10 WeChat official accounts by total WCI.

Serial no.	Journal name	WCI in May	WCI in June	WCI in July	Total WCI	Average WCI
1	*Nature History*	1362.28	1371.74	1378.72	4112.74	1370.91
2	*Scientific American*	1342.10	1359.44	1360.47	4062.01	1354.00
3	*Chinese National Geography*	1318.99	1350.50	1358.54	4028.03	1342.67
4	*Family Doctor*	1214.49	1215.80	1213.14	3643.43	1214.47
5	*Aerospace Knowledge*	1109.23	1147.22	1126.18	3382.63	1127.54
6	*Diabetes Friend*	971.11	1001.09	1016.08	2988.28	996.09
7	*Motorcycle*	965.48	950.37	925.26	2841.11	947.03
8	*Portrait Photography*	894.24	915.63	882.12	2691.99	897.33
9	*Art And Design*	881.75	836.94	806.59	2525.28	841.76
10	*Small Arms*	823.52	778.90	806.38	2408.80	802.93

Note: The data was extracted on August 1, 2022.

3.2.3 Dissemination of WeChat Channels of Popular Science Journals

Using the Qingbo Index as the primary data source, we conducted a comprehensive analysis of 257 sample popular science journals, focusing on their WeChat Official Accounts and Channels. The study specifically extracted communication data from the WeChat Channels of these journals covering the period from March to August 2022. The WeChat Video Communication Index (WVCI), developed by the GSDATA, measures the influence of WeChat Channels based on video output, engagement metrics, and audience reach. WVCI assesses performance across four key dimensions: activity level, dissemination power, recognition rate, and interaction depth, and is divided into the number of videos published, shares, likes, comments, maximum shares per video, maximum likes per video, and maximum comments per video.

As of August 2022, only 75 popular science journals had activated WeChat Channels, accounting for 29.18%, which is less than one-third of the total. Table 3.7 shows the top 10 popular science journals in WVCI that opened WeChat Channels.

From the perspective of published content volume, the overall activity level of WeChat Channels of science journals remains relatively low. The data shows that 52 journals released content on WeChat Channels during this period (>1 video published), while 23 journals did not post (0 video published). There were nine high-activity journals (>100 videos published), including *World Metals*, *Family Doctor*, *Chinese National Geography*, *For Your Health*, *Portrait Photography*, *Liver Doctor*, *Nature History*, *Health Must-Read Magazine*, and *Aerospace Knowledge*.

The number of shares is an essential indicator that measures and reflects an account's communication capacity and effectiveness. Among the 52 popular science journals that opened WeChat Channels and posted videos, the journals with the highest total number of shares are *Family Doctor*, *Chinese National Geography*, and *Aerospace Knowledge*, which are 1 375 213 times, 744 619 times, and 155 264 times, respectively.

The number of likes is a key indicator that reflects the audience's recognition and interaction with the content. Among the 52 popular science journals that opened WeChat Channels and posted videos, the highest total number of likes is *Family Doctor* (39 116 times), followed by *Chinese National Geography* (19 193 times), *Portrait Photography* (8495 times), and *Aerospace Knowledge* (8207 times).

Statistics show that most popular science journals do not pay enough attention to their WeChat Channels, exhibiting unoriginal planning and outdated formats. This resulted in insufficient interaction with the audience and prevented the full utilization of the traffic advantages of the short video platform. At the same time, some journals such as *Family Doctor*, *Chinese National Geography*, and *Aerospace Knowledge* seized the opportunity and took advantage of the short video platform, making fruitful explorations and practices in integrated media and video-based transformation of science communication content.

3.2.4 Dissemination of the Douyin Account of Popular Science Journals

Douyin, launched on September 20, 2016, is a short video platform for all ages. We searched the 257 popular science journals on Douyin, cross-checking verification status, account names, and profiles. We found that 84 journals had opened Douyin accounts, with an opening rate of 32.68%. Using the Qingbo Index platform, we analyzed data from July to September 2022 for these 84 accounts, evaluating their video output, engagement metrics, and audience reach to assess their influence on short-video platforms. The top 10 by Douyin Communication Index (DCI)[4] were ranked (table 3.8).

[4]DOuyin Communication Index (DCI) comprehensively reflects the communication capability of Douyin accounts on short video platforms by examining the short videos released by Douyin accounts in terms of video output, engagement metrics, and audience reach. It mainly focused on three dimensions: release index, interaction index, and coverage index, consisting of three tier-1 indicators and six tier-2 indicators, and assigned different weights.

Tab. 3.7 – WCI of China's popular science journals from March to August 2022.

Journal name	No. of journals	Max no. of likes	Max no. of comments	Max no. of retweets	Total no. of likes	Average no. of likes	Total no. of comments	Average no. of comments	Total no. of retweets	Average no. of retweets	WVCI
Family Doctor	243	100 002	5640	100 002	735 021	3024.77	39 116	160.97	1 375 213	5659.31	934.98
Chinese National Geography	181	14 002	417	50 402	492 950	2723.48	19 193	106.03	744 619	4113.91	853.90
Portrait Photography	157	100 002	5649	100 002	140 572	895.36	8495	54.10	147 421	938.98	840.97
Aerospace Knowledge	100	51 802	4457	100 002	76 378	763.78	8207	82.07	155 264	1552.64	831.70
Nature History	127	864	142	1035	42 527	334.85	4477	35.25	32 059	252.43	644.65
World Metals	278	10 202	360	1384	26 692	96.01	1105	3.97	9532	34.28	605.65
Top 4 × 4 Magazine	42	1210	173	2487	6084	144.85	1072	25.52	10 788	256.85	601.52
Popular Auto	22	538	33	1277	3041	138.22	167	7.59	4854	220.63	521.62
Sichuan Cuisine	14	1225	99	393	2970	212.14	197	14.07	1514	108.14	520.63
For Your Health	159	3012	6	268	50 857	319.85	55	0.34	4154	26.12	500.42

Note: The data was extracted on September 1, 2022.

Tab. 3.8 – DCI ranking of China's popular science journals (Top 10).

Ranking	Journal title	No. of videos in Jul	DCI in Jul	Journal title	No. of videos in Aug	DCI in Aug	Journal title	No. of videos in Sept	DCI in Sept
1	*Insight China*	375	896.69	*Insight China*	532	1098.65	*Insight China*	348	1010.24
2	*Nature History*	12	850.07	*Nature History*	20	1005.41	*Chinese National Geography*	8	942.99
3	*Chinese National Geography*	15	781.72	*NAAS & Inertial Technology*	172	834.44	*Nature History*	20	914.25
4	*Family Doctor*	38	763.27	*Chinese National Geography*	10	799.15	*NAAS & Inertial Technology*	172	843.89
5	*China Three Gorges*	24	747.37	*Hundred Thousand Whys*	25	792.18	*Family Doctor*	45	840.49
6	*NAAS & Inertial Technology*	180	747.12	*China Three Gorges*	23	732.58	*Hundred Thousand Whys*	29	792.27
7	*Portrait Photography*	31	714.36	*Family Doctor*	37	703.40	*China Three Gorges*	28	717.98
8	*World Metals*	29	693.01	*Portrait Photography*	20	635.07	*Motorcycle*	14	635.88
9	*Love and Health*	17	651.50	*World Metals*	35	619.17	*World Metals*	31	615.18
10	*Motorcycle*	13	582.26	*Motorcycle*	19	606.75	*Portrait Photography*	5	583.07

Follower count represents the user base for a Douyin account's communication and interaction, serving as the foundation for its reach, while likes, shares, and comments reflect direct user feedback on the content, key behavioral indicators of audience engagement. An analysis of the top five popular science journals by DCI ranking from July to September 2022 reveals their total followers, likes, shares, and comments for the period (table 3.9). Leading accounts include *Insight China*, *Nature History*, and *Chinese National Geography*, ranked steadily in the top five. The number of posts on Nature History and Chinese National Geography was relatively stable, while the number of posts on Insight China showed a significant increase in August, with a sharp rise in followers from 15 011 to over 400 000 in August, accompanied by parallel spikes in likes, shares, and comments. The highest number of likes and comments from July to September was all for *Insight China*; the journals with the highest number of shares in July, August, and September were *Family Doctor*, *Nature History*, and *Insight China*, respectively. Overall, the differences in the number of likes, shares, and comments among different Douyin accounts were notable.

Tab. 3.9 – DCI rankings of China's popular science journals (Top 5).

Month	Journal title	No. of journals	No. of followers	No. of likes	No. of shares	No. of comments
July	*Insight China*	375	15 011	35 225	5459	22 235
	Nature History	12	360 000+	35 027	4484	2488
	Chinese National Geography	15	2 420 000	30 589	856	1282
	Family Doctor	38	32 308	4956	6285	636
	China Three Gorges	24	99 070	10 369	1534	724
August	*Insight China*	532	400 000+	350 000+	27 405	130 000+
	Nature History	20	370 000+	140 000+	30 205	26 573
	NAAS & Inertial Technology	172	21 869	53 249	1601	6210
	Chinese National Geography	10	2 430 000	29 713	948	1471
	Hundred Thousand Whys	25	130 000+	84 249	835	2315
September	*Insight China*	348	400 000+	200 000+	20 600	17 112
	Chinese National Geography	8	2 480 000	190 000+	5463	11 446
	Nature History	20	390 000+	60 810	6500	10 022
	NAAS & Inertial Technology	172	30 372	64 246	1480	7676
	Family Doctor	45	34 562	10 804	8530	2926

3.2.5 Dissemination of the Bilibili Platform of Popular Science Journals

Bilibili, affectionately known to users as "B Site", is a comprehensive video community among Chinese youth. Centered around users, creators, and content, it has fostered a self-sustaining ecosystem that continuously generates high-quality content across thousands of categories such as knowledge & education, lifestyle & culture, gaming & animation, fashion & beauty, music & entertainment, etc. Using the Qingbo Index platform, we extracted and analyzed the communication data of popular science journals with Bilibili accounts from July to September 2022. Statistics show that 41 out of 257 journals (15.95%) established Bilibili accounts — a relatively low penetration rate. These 41 popular science journals span diverse fields, covering natural science, medical and health, automobile, computer, home decoration, photography, and others, which also include popular science readings for children and teenagers.

The top 10 popular science journals by Bilibili Video Communication Index (BVCI[5]), July to September 2022, were selected (table 3.10).

In terms of the number of videos published, an average of 16 journals updated their videos every month. There is a notable disparity in the number of video releases across journals. In September, the journal with the highest total number of video outputs was *Green China*, which updated 151 videos, 4.08 times the number of the second-ranked popular science journal. The following were *China Three Gorges*, *Juvenile Science Pictorial*, and *Car and Driver (China Edition)*, which updated 37, 31, and 30 videos in sequence, much less than the number of videos released compared with *Green China*.

The play count is a key metric for assessing the reach of video content. Among the 41 popular science journals with Bilibili accounts, 21 videos were published between July and September 2022. There were five journals with an average monthly play count below 1000 times, and seven journals with a play count ranging from 1000 to 10 000 times, while nine journals achieved over 10 000 average monthly plays. Among them, *Chinese National Geography* had the highest average monthly view, over 2.77 million times, and its single-month views from July to September exceeded 2.4 million times. The monthly average views of *Nature History* exceeded 3 516 700 times, surpassing those of *Chinese National Geography*, and its single-month views in August were as high as 5.24 million times, which is the highest among the 21 science journals. *Family Doctor* has an average of about 610 000 views per month, and *Juvenile Scientific Pictorial* has an average of 92 300 views per month. In addition, these four journals, which have a high average monthly view count, all released a relatively stable number of videos from July to September. The number of followers also showed a continuous growth trend, indicating that the continuous and stable output of high-quality works is a key factor in attracting users and expanding influence.

The number of comments reflects viewer engagement with video content. Among the 41 popular science journals that have opened accounts on Bilibili, 19 received user comments

[5]Bilibili Video Communication Index (BVCI) is based on the data of the video release, number of subscribers, number of views, and comments of the accounts, which is used to reflect the influence and communication effect of the video account of Bilibili.

Tab. 3.10 – BVCI rankings of popular science journals in China (Top 10).

Month	Journal name	No. of releases	No. of monthly views	No. of comments	Bilibili Video Communication Index (BVCI)
July	*Chinese National Geography*	5	2 410 000+	4028	820.44
	Nature History	5	4 340 000+	1593	728.72
	Family Doctor	5	880 000+	1228	661.78
	Micro Computer	3	49 724	193	559.89
	Science Fiction World	4	37 250	89	544.2
	Car and Driver (China ed.)	7	42 831	210	524.92
	Motorcycle	5	22 553	159	519.42
	China Three Gorges	11	29 070	179	458.48
	Photo World	2	7244	36	448.58
	Juvenile Scientific Pictorial	10	10 153	89	415.23
August	*Chinese National Geography*	5	2 840 000+	5872	965.63
	Nature History	9	5 240 000+	3937	915.79
	Family Doctor	4	220 000+	519	707.59
	Juvenile Scientific Pictorial	10	220 000+	135	588.87
	Motorcycle	7	24 343	143	569.98
	Micro Computer	3	33 423	32	539.53
	Car and Driver (China ed.)	16	29 424	161	537.94
	China Three Gorges	13	27 674	146	525.12
	Elle Decoration	5	5089	6	475.97
	Green China	70	11 387	22	347.18
September	*Chinese National Geography*	7	3 050 000+	5505	955.41
	Nature History	9	970 000+	4696	868.92
	Family Doctor	5	720 000+	1874	781.00
	Motorcycle	2	24 711	142	621.83
	China Three Gorges	13	99 346	398	614.06
	Car and Driver	7	58 551	292	605.89
	Micro Computer	4	37 036	121	584.10
	Juvenile Scientific Pictorial	11	46 785	182	573.37
	Auto Guide	1	12 658	102	512.44
	AutoSports	1	9435	4	449.12

from July to September 2022. The highest number of comments in a single month was 5872, while the lowest was just one. The journals with the highest average monthly comments were *Chinese National Geography*, *Natural History*, *and Family Doctor*, each averaging over 1000 comments. In contrast, the remaining 16 journals all had fewer than 300 average monthly comments, indicating that most popular science journals still have room for improvement in boosting viewer engagement.

Chapter 4

Overview of Papers Published in China's Scientific Journals

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Abstract

This chapter analyzes the output of papers published in China's scientific journals based on domestic and international databases. The analysis focuses on publication output, disciplinary distribution, regional distribution, institutional distribution, funding support, international collaboration, and academic impact. Additionally, it examines the distribution of high-impact papers and hot papers authored by Chinese researchers across various disciplines, institutions, and affiliated journals.

According to the InCites database, there were 235 SCI journals in China in 2022. Chinese authors published 740 776 SCI papers, accounting for 32.42% of global SCI papers, while China's SCI journals published 37 561 papers, representing 1.64% of the global total. Chinese authors contributed 32 919 of these papers, accounting for 87.64% of papers published in China's SCI journals. Over the decade from 2013 to 2022, the number of SCI papers authored by Chinese researchers grew steadily, with the 2022 figure being 3.45 times that of 2013. In contrast, the growth of papers published in China's SCI journals was slower, resulting in a widening gap between the two. In 2013, the number of SCI papers authored by Chinese researchers was eight times that of papers published in China's SCI journals. By 2022, this ratio had increased nearly 20 times.

From 2013 to 2022, the number of papers published in China's SCI journals by international authors showed an overall upward trend. In 2013, the proportion of overseas authors publishing in Chinese SCI journals was 9.53%. The figure peaked in 2020 at 19.76%, then experienced a slight decline in 2021 and 2022 alongside the growth in the total number of papers published in China's SCI journals, reaching 18.11% by 2022.

In terms of citations, SCI papers authored by Chinese researchers were cited 1 988 706 times in 2022, accounting for 39.85% of global SCI citations. Papers published in China's SCI journals were cited 145 675 times, representing 2.92% of global citations, higher than their proportion of global publications (1.64%). Fourteen disciplines demonstrated a citation share exceeding 1.00% for papers published in China's SCI journals relative to the

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global SCI citations in the same disciplines. The top five disciplines ranked by citation share were "materials science" (7.75%), "physics" (7.54%), "geosciences" (5.24%), "chemistry" (4.06%), and "plant & animal sciences" (3.77%).

In 2022, the citation impact of papers published in China's SCI journals was 3.88, while that of SCI papers authored by Chinese researchers was 2.68. Both figures were higher than the global average of 2.18. Since 2021, the citation impact of papers published in China's SCI journals has surpassed that of SCI papers authored by Chinese researchers. The gap between these two metrics widened from 0.52 in 2021 to 1.20 in 2022.

In 2022, 137 of China's SCI journals were ranked as Q1 journals, accounting for 58.30% of China's SCI journals and 3.96% of the global Q1 journals (3461 journals). China's Q1 journals published 22 106 papers, representing 2.33% of global Q1 journal output (947 219 papers) during the same period. There were 14 China's SCI journals that published 20 or more highly cited papers. All of them were English-language journals: *Journal of Materials Science & Technology* ranked first (125 papers), followed by *Bioactive Materials* (111 papers) and *Chinese Chemical Letters* (80 papers).

In 2022, internationally co-authored papers accounted for 18.13% of papers published in China's SCI journals, whereas the percentage for papers authored by Chinese researchers overall was 20.58%. Both figures were lower than the global average of 26.47% for internationally collaborative publications.

China's SCI journals published 1218 highly cited papers in 2022, accounting for 5.06% of global highly cited papers (24 086 papers in total). Chinese authors published 11 459 highly cited papers, representing 47.58% of the global total, while China's institutions published 11 350 highly cited papers, accounting for 47.12% of the global total. Between 2013 and 2022, Chinese authors published 65 962 highly cited papers, representing 35.95% of the worldwide total. The number of highly cited papers authored by Chinese researchers as first or corresponding authors increased from 1694 in 2013 to 10 656 in 2022, a growth of 529.04%. For the first time, this figure exceeded 10 000 in 2022.

In 2022, China's SCI journals published 126 hot papers, accounting for 5.41% of the global total. Chinese authors published 1141 hot papers, representing 48.97% of the global total, while Chinese institutions published 1127 hot papers, accounting for 48.37%.

This section presents an analysis of China's SCI-indexed STM journals (hereafter referred to as "China's SCI Journals"), based on indicator data from InCites,[1] including quantitative data such as disciplinary distribution, international disciplinary collaborations, international collaborations, and scholarly influence, to reveal the influence and international status of China's SCI journals from a global perspective.

[1]The InCites database, a product of Clarivate, has been developed based on the authoritative citation data from WoS Core Collection. The database integrates various bibliometric indicators and international benchmarking data across different disciplines and years, serving as a tool for research performance analysis and disciplinary assessment. The subject classification employed in this section is based on the ESI (Essential Science Indicators) classification model, a broad, journal-based classification system comprising 22 disciplines in the natural and social sciences. Each journal is assigned to only one discipline among the 22. The database was last updated on July 28, 2023, with data from WoS updated as of June 30, 2023, and the retrieval date was August 1st, 2023.

4.1 Disciplinary Distribution of Papers Published in China's SCI Journals

From a disciplinary perspective, this section conducts statistical analyses of relevant SCI publication data in 2022 — including global SCI papers, SCI papers authored by Chinese researchers, papers published in China's SCI journals, and papers published by Chinese authors in domestic SCI journals — based on key academic metrics such as paper volume, citation frequency, citation impact, and the percentage of internationally co-authored papers, and so on.

4.1.1 Volume of Papers Published in China's SCI Journals

In terms of the volume of SCI papers published, Chinese authors contributed 740 776 papers to SCI journals in 2022, accounting for 32.42% of the global total of 2 284 623 papers. This represents an increase of 98 385 papers compared to 642 391 papers in 2021, with the percentage increasing by 5.02 percentage points (pp) from 27.40% in 2021. During the same period, 235[2] China's SCI journals published 37 561 papers, representing 1.64% of the global total. This marks an increase of 2516 papers compared to the 35 045 papers published by 232 China's SCI journals in 2021, which accounted for 1.49% of the global total. From a quantitative perspective, since 2018, the number of China's SCI journals and their publication volumes have shown a slow upward trend. Nevertheless, this growth remains significantly behind the number of SCI papers authored by Chinese researchers and their growth rate (figure 4.1). Papers written by Chinese researchers constitute the primary source of content for China's SCI journals, with 32 919 papers published, accounting for 87.64% of all papers published in China's SCI journals. This figure represents a marginal increase from the 85.62% recorded in 2021.

From 2013 to 2022, the number of SCI papers published by Chinese authors increased steadily, with the 2022 publication volume being 3.45 times that of 2013. In contrast, the number of papers published in China's SCI journals grew at a much slower pace, resulting in an expanding gap between the two. In 2013, the number of SCI papers authored by Chinese researchers was eight times that of papers published in China's SCI journals. By 2022, this ratio had grown to nearly 20 times (figure 4.2).

From 2013 to 2022, the proportion of papers authored by overseas authors in China's SCI journals exhibited a general upward trend. In 2013, the proportion of papers by overseas authors in China's SCI journals was 9.53%, reaching a peak of 19.76% in 2020. However, it declined slightly in 2021 and 2022 as the total volume of publications in China's SCI journals increased, reaching 18.11% in 2022.

An analysis of overseas authors' publication trends in Chinese journals by discipline reveals that the annual publication volume across various disciplines generally demonstrate a steady growth pattern, as detailed in table 4.1. Among the disciplines, "Materials Science", "Physics", "Engineering", "Chemistry", "Geosciences", and "Biology & Zoology"

[2]A total of 287 China's (excluding Hong Kong SAR, Macao SAR, and Taiwan) STM journals were retrieved in InCites database, 52 journals without CN numbers. Thus, 235 China's STM journals are included in the statistics of this chapter.

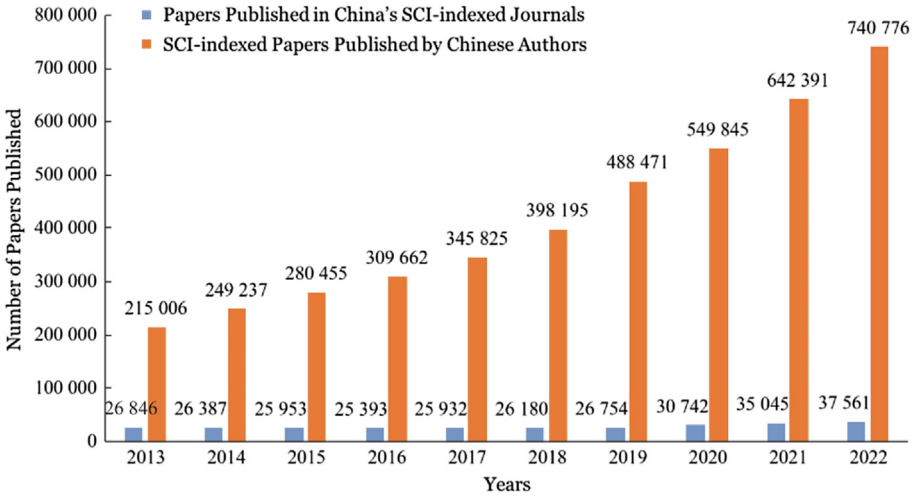

FIG. 4.1 – Number of SCI papers published by China's SCI journals and Chinese authors from 2013 to 2022. Note: The data from 2013 to 2021 are derived from the *Blue Book on China's Scientific Journal Development* (2020, 2021, and 2022 editions). The 2022 data was retrieved using the InCites database, selecting "Research Area" with the publication date set to 2022, ESI classification, and document types "Article" and "Review." Data from China's SCI journals and Chinese authors are collected separately in the database.

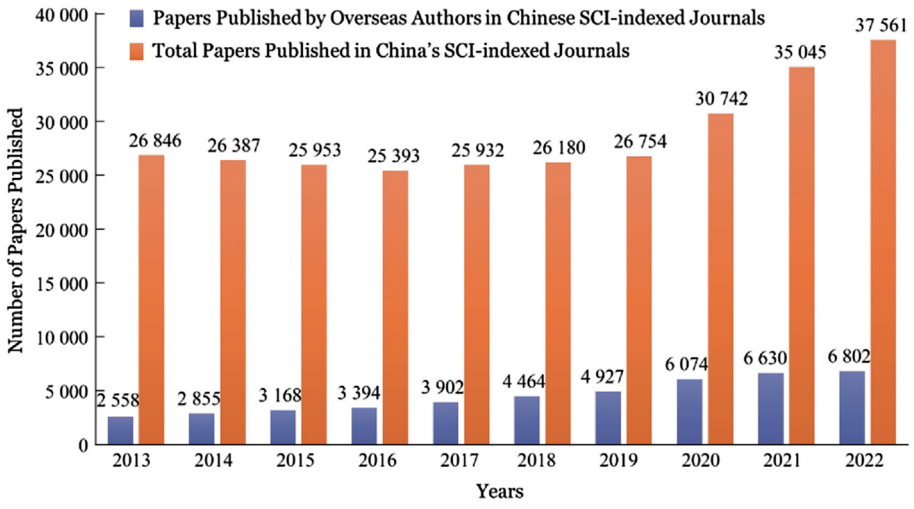

FIG. 4.2 – Papers published by overseas authors in China's SCI journals from 2013 to 2022. Note: Using the InCites database, the data collection for 2013–2022 involved selecting "Research Area," the publication date of 2013–2022, ESI classification, and document types "Article" and "Review", and "International" for Chinese/overseas co-authored papers. Data on publications in China's SCI journals and those by overseas authors in China's SCI journals are collected in turn. Statistics on papers with overseas authors refer to papers with at least one overseas author, including papers co-authored by Chinese and overseas researchers.

TAB. 4.1 – Publication volume of overseas authors in China's SCI journals by discipline from 2013 to 2022.

No.	Discipline	No. of papers published by overseas authors in China's SCI journals									
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
1	Agricultural Sciences	67	102	134	123	174	201	211	247	279	360
2	Biology & Biochemistry	71	108	74	81	89	94	87	92	102	114
3	Chemistry	232	231	259	257	282	360	389	563	701	577
4	Clinical Medicine	160	164	167	186	178	215	231	227	239	284
5	Computer Science	138	130	144	168	164	163	186	203	173	205
6	Economics & Business	0	0	0	0	0	1	0	0	0	0
7	Engineering	218	273	303	371	435	490	644	742	813	826
8	Environment/Ecology	143	165	172	206	260	266	272	304	347	376
9	Geosciences	225	278	358	371	398	482	475	540	573	589
10	Immunology	20	32	40	81	106	94	88	130	98	81
11	Materials Science	276	297	335	323	387	448	630	901	1179	1355
12	Mathematics	157	150	148	138	163	184	163	186	157	143
13	Microbiology	0	0	7	5	19	13	18	25	16	8
14	Molecular Biology & Genetics	76	73	89	106	107	123	122	182	181	163
15	Multidisciplinary	0	0	2	0	1	2	1	4	5	4
16	Neuroscience & Behavior	40	43	56	46	70	80	89	116	102	106
17	Pharmacology & Toxicology	43	50	58	67	80	96	109	148	141	117
18	Physics	437	484	515	528	612	723	719	866	887	881
19	Plant & Animal Science	232	251	269	288	342	385	434	559	541	550
20	Psychiatry/Psychology	0	0	0	0	0	0	0	0	1	0
21	Social Sciences	0	0	0	0	0	1	1	0	1	1
22	Space Science	23	24	38	49	35	43	58	39	94	62
	Total	2558	2855	3168	3394	3902	4464	4927	6074	6630	6802

Note: Data retrieval methodology – select "Research Area" in InCites database; publication date: 2013–2022; Essential Science Indicators (ESI) as the discipline classification system; document type: "Article" and "Review"; select "International" for Chinese/international collaboration; data of publications in China's indexed journals and those by overseas authors in China's SCI journals were collected in turn. Ranked in alphabetical order of disciplines.

showed significant growth between 2018 and 2022, especially "Materials Science". However, some disciplines, such as "Chemistry", "Immunology", "Mathematics", "Microbiology", "Molecular Biology & Genetics", "Pharmacology & Toxicology", and "Space Science" — experienced notable declines in the number of papers authored by overseas researchers in 2022, and "Chemistry" showed a decrease of 124 papers.

As shown in table 4.2, the discipline with the highest proportion of SCI papers published in China's STM journals relative to global SCI publications in the same field was "Physics" (5.25%). Other disciplines remained below 5%, with "Materials science" (4.06%), "Geosciences" (3.99%), and "Chemistry" (2.66%) exceeding 2%. Nine disciplines fell within the 1%–2% range, while six were below 1%. Notably, "Psychiatry & Physiology" and "Social Sciences" each published only one paper, while "Economics & Business" had no publications.

In 2022, Chinese authors accounted for over 10% of global SCI publications across all disciplines, with ten disciplines having a proportion of more than 30%. The number of SCI papers published by Chinese authors in the field of "Materials Science" accounts for 50.86% of the global number of SCI papers in the same discipline, meaning half of the academic papers in this discipline are contributed by Chinese authors. Additionally, "Engineering," "Computer Science," and "Geosciences" all have Chinese authors contributing more than 40% of global SCI papers. A comparison between the proportion of SCI papers authored by Chinese researchers and the proportion of papers published in Chinese SCI journals across various disciplines reveals a significant disparity between the two metrics. There are nine disciplines where the difference between the proportion of Chinese-authored SCI papers and those published in Chinese SCI journals exceeds 30%, namely: "Materials Science" (46.80%), "Engineering" (44.36%), "Computer Science" (44.25%), "Geosciences" (39.13%), "Molecular Biology & Genetics" (36.61%), "Chemistry" (36.48%), "Environment/Ecology" (33.88%), "Agricultural Sciences" (33.43%), and "Physics" (30.47%). Furthermore, there were eight disciplines in which the ratio of the proportion of Chinese-authored SCI papers to the proportion of papers published in Chinese SCI journals exceeds 30%, including: "Microbiology" (99.45), "Immunology" (49.85), "Multidisciplinary" (49.82), "Clinical Medicine" (48.88), "Computer Science" (34.27), "Biology & Biochemistry" (33.84), "Engineering" (31.38), and "Molecular Biology & Genetics" (30.76).

In 2022, "Physics" had the highest proportion (13.46%) of papers authored by Chinese researchers in China's SCI journals. The other disciplines with a share exceeding 5% were, in descending order: "Geosciences" (8.21%), "Space Science" (7.27%), "Materials Science" (6.94%), and "Chemistry" (6.57%). In terms of the source of papers published in China's SCI journals, Chinese authors were the main contributors (>90%) in these nine disciplines: "Psychiatry & Physiology" (100.00%), "Social Sciences" (100.00%), "Chemistry" (96.51%), "Microbiology" (95.79%), "Biology & Biochemistry" (93.03%), "Multidisciplinary" (92.86%), "Computer Science" (92.78%), "Physics" (91.68%), and "Molecular Biology & Genetics" (90.02%). Among these disciplines, those with relatively high proportions of both China's SCI journal papers and Chinese-authored SCI papers in the global SCI total were "Chemistry," "Computer Science," "Molecular Biology & Genetics," and "Physics." Disciplines where the proportion of Chinese-authored SCI papers was relatively high but the proportion of China's SCI-journal papers was relatively low included "Biology & Biochemistry" and "Microbiology." Disciplines with relatively low proportions for both measures included "Multidisciplinary," "Psychiatry & Physiology," and "Social Sciences."

TAB. 4.2 – SCI publication volume by discipline (global, China's SCI journals, and Chinese authors) in 2022.

No.	Discipline	No. of global SCI papers (A)	No. of SCI papers in China's STM journals (B)	Proportion ($B/A \times 100\%$)	No. of SCI papers by Chinese authors (C)	Proportion ($C/A \times 100\%$)	No. of SCI papers by Chinese authors in China's STM journals (D)	Proportion ($D/C \times 100\%$)	Proportion ($D/B \times 100\%$)
1	Agricultural Sciences	71 402	1365	1.91	25 230	35.34	1117	4.43	81.83
2	Biology & Biochemistry	92 659	789	0.85	26 649	28.76	734	2.75	93.03
3	Chemistry	231 133	6156	2.66	90 471	39.14	5941	6.57	96.51
4	Clinical Medicine	388 315	1688	0.43	81 611	21.02	1322	1.62	78.32
5	Computer Science	75 915	1011	1.33	34 600	45.58	938	2.71	92.78
6	Economics & Business	42 488	0	0.00	8717	20.52	0	0.00	–
7	Engineering	283 665	4130	1.46	129 980	45.82	3458	2.66	83.73
8	Environment/Ecology	126 687	1753	1.38	44 675	35.26	1444	3.23	82.37
9	Geosciences	74 308	2964	3.99	32 039	43.12	2632	8.21	88.80
10	Immunology	36 522	191	0.52	9465	25.92	117	1.24	61.26
11	Materials Science	163 879	6657	4.06	83 342	50.86	5784	6.94	86.89
12	Mathematics	59 910	870	1.45	17 786	29.69	758	4.26	87.13
13	Microbiology	33 210	95	0.29	9579	28.84	91	0.95	95.79
14	Molecular Biology & Genetics	52 041	641	1.23	19 691	37.84	577	2.93	90.02
15	Multidisciplinary	3082	14	0.45	691	22.42	13	1.88	92.86
16	Neuroscience & Behavior	61 511	600	0.98	14 220	23.12	367	2.58	61.17
17	Pharmacology & Toxicology	61 743	844	1.37	19 295	31.25	757	3.92	89.69
18	Physics	113 264	5941	5.25	40 459	35.72	5447	13.46	91.68
19	Plant & Animal Science	94 966	1586	1.67	24 326	25.62	1200	4.93	75.66
20	Psychiatry/Psychology	64 289	1	0.00	9898	15.40	1	0.01	100.00
21	Social Sciences	137 062	1	0.00	15 027	10.96	1	0.01	100.00
22	Space Science	16 572	264	1.59	3025	18.25	220	7.27	83.33
	Total	2 284 623	37 561	1.64	740 776	32.42	32 919	4.44	87.64

Note: Retrieval method – select "Research Area" in InCites dataset; publication date: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "Article" and "Review"; then sequentially retrieve the data of papers published globally, articles published in China's SCI journals, global papers by Chinese authors, and papers published by Chinese authors in China's SCI journals.
Ranked in alphabetical order of disciplines.

4.1.2 Academic Impact of Papers Published in China's SCI Journals

4.1.2.1 Citation Frequency

In 2022, the total number of citations for SCI papers authored by Chinese authors reached 1 988 706, accounting for 39.85% of the global citation frequency of SCI papers (4 990 308). The citations of papers published in China's SCI journals reached 145 675, representing 2.92% of global SCI paper citations during the same period, higher than the proportion of China's SCI journal papers in the total global SCI papers (1.64%).

As shown in table 4.3, the citation frequency of papers published in China's SCI journals accounted for more than 1% of the global citation frequency in 14 disciplines. The top five disciplines with the highest proportions were "Materials Science" (7.75%), "Physics" (7.54%), "Geosciences" (5.24%), "Chemistry" (4.06%), and "Plant and Animal Science" (3.77%).

In 12 disciplines, the citation frequency of SCI papers authored by Chinese researchers accounted for more than 30% of the global citation frequency in the same discipline. Among them, four disciplines exceeded 50%: "Materials Science" (61.84%), "Engineering" (53.00%), "Computer Science" (52.80%), and "Geosciences" (51.14%). The remaining disciplines were: "Chemistry" (47.43%), "Agricultural Sciences" (44.48%), "Environment/Ecology" (44.41%), "Physics" (40.56%), "Mathematics" (38.14%), "Molecular Biology & Genetics" (35.47%), "Plant and Animal Science" (33.60%), and "Pharmacology & Toxicology" (31.69%). In addition, except for "Molecular Biology & Genetics", 11 of these disciplines (excluding), the citation share of Chinese-authored papers exceeded their publication share in the remaining 11 disciplines.

In terms of the citation frequency of papers by Chinese authors in China's SCI journals, seven disciplines exceeded 90% of the total citations of China's SCI journal papers. These disciplines included "Multidisciplinary" (99.43%), "Microbiology" (97.04%), "Chemistry" (95.96%), "Computer Science" (93.15%), and "Molecular Biology & Genetics" (92.94%). Due to the uneven disciplinary distribution of China's SCI journals, "Psychiatry & Physiology" and "Social Sciences" each published only one and two papers, respectively, with citation proportions reaching 100%.

4.1.2.2 Citation Impact and Proportion of Cited Papers

In 2022, the citation impact[3] of papers published in China's SCI journals was 3.88, while the citation impact for SCI papers authored by Chinese researchers was 2.68. Both figures were higher than the global average citation impact for SCI papers (2.18). Since 2021, the citation impact of papers published in China's SCI journals has surpassed that of SCI papers authored by Chinese researchers, with the gap increasing from 0.52 in 2021 to 1.20 in 2022 (figure 4.3).

As shown in table 4.4, 16 disciplines showed citation impacts of China's SCI journal papers exceeding their respective global discipline averages, including "Agricultural

[3]Citation impact is calculated as the total number of citations divided by the total number of papers in a given set of documents, representing the average number of citations per paper.

Tab. 4.3 – Citation frequency of SCI papers in 2022 (global, China's SCI journals, and Chinese authors).

No.	Discipline	Citation frequency of global papers (A)	Citation frequency of China's SCI journal papers (B)	Proportion ($B/A \times 100\%$) /%	Citation frequency of papers by Chinese Authors (C)	Proportion ($C/A \times 100\%$) /%	Citation frequency of papers by Chinese authors in China's SCI journals (D)	Proportion ($D/C \times 100\%$) /%	Proportion ($D/B \times 100\%$) /%
1	Agricultural Sciences	148 355	4571	3.08	65 990	44.48	3785	5.74	82.80
2	Biology & Biochemistry	223 858	1696	0.76	64 814	28.95	1495	2.31	88.15
3	Chemistry	632 385	25 698	4.06	299 963	47.43	24 661	8.22	95.96
4	Clinical Medicine	692 579	4148	0.60	129 617	18.72	3141	2.42	75.72
5	Computer Science	166 011	2834	1.71	87 654	52.80	2640	3.01	93.15
6	Economics & Business	80 895	0	0.00	23 989	29.65	0	0.00	–
7	Engineering	726 125	13 952	1.92	384 830	53.00	11 468	2.98	82.20
8	Environment/Ecology	308 840	6987	2.26	137 168	44.41	5823	4.25	83.34
9	Geosciences	152 220	7981	5.24	77 845	51.14	6979	8.97	87.45
10	Immunology	106 416	747	0.70	23 128	21.73	398	1.72	53.28
11	Materials Science	534 913	41 474	7.75	330 779	61.84	36 249	10.96	87.40
12	Mathematics	55 794	628	1.13	21 281	38.14	560	2.63	89.17
13	Microbiology	76 550	203	0.27	20 848	27.23	197	0.94	97.04
14	Molecular Biology & Genetics	152 262	5287	3.47	54 004	35.47	4914	9.10	92.94
15	Multidisciplinary	10 220	174	1.70	2407	23.55	173	7.19	99.43
16	Neuroscience & Behavior	119 897	2431	2.03	22 993	19.18	1309	5.69	53.85
17	Pharmacology & Toxicology	133 233	3936	2.95	42 223	31.69	3419	8.10	86.86
18	Physics	231 562	17 465	7.54	93 924	40.56	15 575	16.58	89.18
19	Plant & Animal Science	137 085	5164	3.77	46 061	33.60	4179	9.07	80.93
20	Psychiatry/Psychology	88 246	1	0.00	14 006	15.87	1	0.01	100.00
21	Social Sciences	166 960	2	0.00	36 319	21.75	2	0.01	100.00
22	Space Science	45 902	296	0.64	8863	19.31	235	2.65	79.39
	Total	4 990 308	145 675	2.92	1 988 706	39.85	127 203	6.40	87.32

Note: Retrieval method – select "Research Area" in InCites dataset; publication date: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "Article" and "Review"; then sequentially retrieve the data of global, China's SCI-indexed journals, Chinese authors, and Chinese-author papers in China's SCI-indexed journals. Ranked in alphabetical order of disciplines.

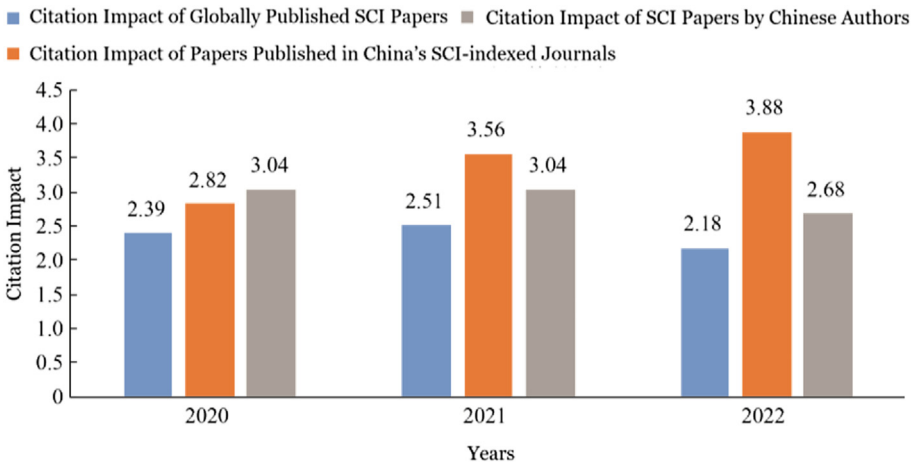

FIG. 4.3 – Citation impact of SCI papers from 2020 to 2022. The 2020 and 2021 data are derived from the *Blue Book on China's Scientific Journal Development* 2021 and 2022 editions. Retrieval method for 2022 data – select "research area" in InCites dataset; publication time: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "research papers" and "review articles"; then sequentially retrieve the data of global, China's SCI-indexed journals, and Chinese-author papers.

Sciences," "Chemistry," "Clinical Medicine," "Computer Science," "Engineering," "Environment/Ecology," "Geosciences," "Immunology," "Materials Science," "Molecular Biology & Genetics," "Multidisciplinary," "Neuroscience & Behavior," "Pharmacology & Toxicology," "Physics," "Plant and Animal Science," and "Social Sciences." Compared with data in 2021, six disciplines newly exceeded global averages in 2022: "Clinical Medicine," "Immunology," "Molecular Biology & Genetics," "Multidisciplinary," "Neuroscience & Behavior," and "Pharmacology & Toxicology". However, three disciplines — "Economics & Business," "Mathematics," and "Psychiatry & Physiology" — had citation impacts below the global average for their respective fields in 2022.

From the perspective of citation impact for SCI papers authored by Chinese researchers, 17 disciplines showed citation impacts above the global average, including "Agricultural Sciences," "Biology & Biochemistry," "Chemistry," "Computer Science," "Economics & Business," "Engineering," "Environment/Ecology," "Geosciences," "Materials Science," "Mathematics," "Multidisciplinary," "Pharmacology & Toxicology," "Physics," "Plant and Animal Science," "Psychiatry & Physiology," "Social Sciences," and "Space Science."

When comparing the citation impact of SCI papers authored by Chinese researchers and those published in China's SCI journals, 12 disciplines had citation impacts for both categories exceeding the global average. These disciplines include "Agricultural Sciences," "Chemistry," "Computer Science," "Engineering," "Environment/Ecology," "Geosciences," "Materials Science," "Multidisciplinary," "Pharmacology & Toxicology," "Physics," "Plant and Animal Science," and "Social Sciences." In contrast, for five disciplines such as "Biology & Biochemistry," "Economics & Business," "Mathematics," "Psychiatry &

Tab. 4.4 – Citation impact and proportion of cited papers for SCI papers by discipline in 2022.

No.	Discipline	Citation impact				Proportion of cited papers (%)			
		Globally published SCI papers	SCI papers published in China's SCI journals	SCI papers by Chinese authors	Chinese authors' publications in China's SCI journals	Globally published SCI papers	SCI papers published In China's SCI journals	SCI papers by Chinese Authors	Chinese Authors' publications in China's SCI journals
1	Agricultural Sciences	2.08	3.35	2.62	3.39	62.87	81.47	70.56	81.47
2	Biology & Biochemistry	2.42	2.15	2.43	2.04	65.71	51.71	65.44	49.59
3	Chemistry	2.74	4.17	3.32	4.15	66.40	65.19	68.51	64.45
4	Clinical Medicine	1.78	2.46	1.59	2.38	53.29	57.52	52.01	56.05
5	Computer Science	2.19	2.80	2.53	2.81	53.81	56.28	54.43	55.44
6	Economics & Business	1.90	0.00	2.75	0.00	51.86	0.00	56.98	0.00
7	Engineering	2.56	3.38	2.96	3.32	62.17	65.28	63.60	63.97
8	Environment/Ecology	2.44	3.99	3.07	4.03	64.53	75.47	68.69	75.97
9	Geosciences	2.05	2.69	2.43	2.65	61.27	60.90	63.71	60.30
10	Immunology	2.91	3.91	2.44	3.40	67.33	82.20	66.43	81.20
11	Materials Science	3.26	6.23	3.97	6.27	68.30	74.61	71.12	72.84
12	Mathematics	0.93	0.72	1.20	0.74	37.24	26.67	39.27	26.78
13	Microbiology	2.31	2.14	2.18	2.16	65.65	77.89	65.19	76.92
14	Molecular Biology & Genetics	2.93	8.25	2.74	8.52	66.05	88.46	65.66	88.21
15	Multidisciplinary	3.32	12.43	3.48	13.31	55.52	100.00	56.87	100.00
16	Neuroscience & Behavior	1.95	4.05	1.62	3.57	59.70	83.67	55.11	83.38
17	Pharmacology & Toxicology	2.16	4.66	2.19	4.52	63.51	76.90	64.05	76.75
18	Physics	2.04	2.94	2.32	2.86	58.13	58.09	58.81	56.47
19	Plant & Animal Science	1.44	3.26	1.89	3.48	54.06	74.65	62.11	77.33
20	Psychiatry/Psychology	1.37	1.00	1.42	1.00	50.48	100.00	49.78	100.00
21	Social Sciences	1.22	2.00	2.42	2.00	44.35	100.00	57.46	100.00
22	Space Science	2.77	1.12	2.93	1.07	68.94	53.03	68.73	54.55
	Total	2.18	3.88	2.68	3.86	58.97	66.12	62.65	64.94

Note: Retrieval method – select "Research Area" in InCites dataset; publication date: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "Article" and "Review"; then sequentially retrieve the data of global, China's SCI-indexed journals, Chinese authors, and Chinese-author papers in China's SCI-indexed journals.

Baseline values were used for citation impact and proportion of cited papers across all disciplines.

Ranked in alphabetical order of disciplines.

Physiology," and "Space Science," the citation impact of SCI papers authored by Chinese researchers was above the global average, while the citation impact of papers published in China's SCI journals was below the global average. For "Clinical Medicine," "Immunology," "Molecular Biology & Genetics," and "Neuroscience & Behavior," the citation impact of papers published in China's SCI journals exceeded the global average. In contrast, that of SCI papers authored by Chinese researchers fell below the global average.

The citation impact of SCI papers authored by Chinese researchers in 15 disciplines exceeded that of SCI papers authored by Chinese researchers during the same period globally. These disciplines include "Agricultural Sciences," "Chemistry," "Clinical Medicine," "Computer Science," "Engineering," "Environment/Ecology," "Geosciences," "Immunology," "Materials Science," "Molecular Biology & Genetics," "Multidisciplinary," "Neuroscience & Behavior," "Pharmacology & Toxicology," "Physics," and "Plant and Animal Science." This indicates that China's SCI journals in the above-mentioned disciplines successfully attracted a higher portion of China's high-quality research papers.

The proportion of cited papers published in China's SCI journals in 2022 was 66.12%, while for SCI papers authored by Chinese researchers, it was 62.65%. Both figures were higher than the global proportion of cited papers for SCI publications during the same period (58.97%). By discipline, the proportion of cited papers in China's SCI journals exceeded the global level for 15 disciplines. Similarly, 14 disciplines showed the proportion of cited SCI papers authored by Chinese researchers surpassing the global average for their respective disciplines. Among these, nine disciplines – "Agricultural Sciences," "Computer Science," "Engineering," "Environment/Ecology," "Materials Science," "Multidisciplinary," "Pharmacology & Toxicology," "Plant and Animal Science," and "Social Sciences" – exhibited proportions of cited papers for both Chinese authors and China's SCI journals above the global average for their respective fields.

4.1.2.3 Category Normalized Citation Impact (CNCI)

In 2022, the Category Normalized Citation Impact (hereinafter "CNCI")[4] of papers published in China's SCI journals was 1.51, while the CNCI of SCI papers authored by Chinese researchers was 1.16. Compared to 2021, when the CNCI for papers published in China's SCI journals was 1.23 and for SCI papers authored by Chinese researchers was 1.15, the citation impact of China's SCI journal publications showed more significant improvement this year.

Based on the CNCI of papers published in China's SCI journals, 16 disciplines had citation impacts above the global average (CNCI $>$ 1.00). The highest CNCI values were observed in "Multidisciplinary" (3.76), "Molecular Biology & Genetics" (2.37), "Plant & Animal Science" (2.17), "Pharmacology & Toxicology" (2.03), and "Materials Science" (1.84). Other disciplines with CNCI $>$ 1.00 included "Neuroscience & Behavior" (1.76), "Social Sciences" (1.69), "Agricultural Sciences" (1.62), "Environment/Ecology" (1.59), "Chemistry" (1.52), Physics" (1.39), "Clinical Medicine" (1.31), "Geosciences" (1.29),

[4]1 The CNCI measures the academic impact of a paper by the number of times it is cited in subsequent research. Since citation rates vary across disciplines and publication years, the CNCI normalizes citation counts by subject category and year of publication, then calculates an average. The global benchmark value is set at 1.00.

"Immunology" (1.25), "Engineering" (1.23), and "Computer Science" (1.18). The remaining six disciplines had CNCI < 1.00.

For SCI papers authored by Chinese researchers, 17 disciplines had CNCI values above the global average. Among disciplines with CNCI < 1.00, "Immunology" had the lowest value (0.83), followed by "Neuroscience & Behavior" (0.85). The remaining three disciplines were close to the global average of 1.00.

The CNCI of SCI papers authored by Chinese researchers in China's SCI journals closely matched the CNCI of papers published in China's SCI journals. For 20 disciplines, the difference between the two was within the range of −0.10 to 0.10. Notably, in "Multidisciplinary," the CNCI of Chinese-author papers in China's SCI journals was 0.27 higher than that of China's SCI journal papers overall, while in "Plant & Animal Science," the CNCI of Chinese-author papers in China's SCI journals was 0.20 higher.

In six disciplines – "Agricultural Sciences," "Environment/Ecology," "Materials Science," "Molecular Biology & Genetics," "Multidisciplinary," and "Plant & Animal Science" – the CNCI rankings followed the order: CNCI of Chinese-author papers in China's SCI journals ≥ CNCI of China's SCI journal papers > CNCI of SCI papers authored by Chinese researchers (figure 4.4).

Seven disciplines showed higher CNCI values for Chinese-authored papers than for China's SCI journals' papers. Among these, the "Economics & Business" discipline exhibited the largest difference ($R > 1.00$). Two disciplines had differences in the range of $0.50 < R \leq 1.00$, and four disciplines had differences in the range of $0 < R \leq 0.50$. Fifteen disciplines had higher CNCI values for China's SCI journals' papers than for Chinese-authored SCI papers. In these, nine disciplines had differences in the range of $-0.50 < R \leq 0$, four disciplines had differences in the range of $-1.00 < R \leq -0.50$, and two disciplines ("Molecular Biology & Genetics" and "Multidisciplinary") showed significant differences ($R \leq -1.00$) (table 4.5).

4.1.2.4 Number of Q1 Journal Papers

In 2022, China's SCI journals published 22 106 Q1 journal papers, accounting for 2.33% of the global Q1 journal papers published during the same period (947 219 papers). Chinese authors contributed 360 687 Q1 journal papers, making up 38.08% of the global total. Over the decade from 2013 to 2022, the number of Q1 journal papers published by China's SCI journals showed a significant increasing trend, with the 2022 figure being 24.05 times higher than that of 2013, as shown in figure 4.5.

In 2022, 137 China's SCI journals (58.30%) were ranked as Q1 journals, accounting for 3.96% of the global total of 3461 Q1 journals. As shown in table 4.6, the disciplines in which China's SCI journals contributed more than 2% of global Q1 journal articles included "Physics" (7.39%), "Materials Science" (5.69%), "Geosciences" (4.10%), "Agricultural Sciences" (3.14%), "Neuroscience & Behavior" (3.10%), "Molecular Biology & Genetics" (2.75%), "Plant & Animal Sciences" (2.66%), "Chemistry" (2.54%), "Multidisciplinary" (2.18%), "Pharmacology & Toxicology" (2.09%), and "Environment/Ecology" (2.05%). The remaining 11 disciplines accounted for less than 2% of the global Q1 journal papers. Regarding the contribution of Chinese authors to Q1 journal papers in China's SCI journals, Chinese authors had a higher proportion of contributions across most disciplines. In 21 disciplines (excluding one with no Q1 journal papers), Chinese authors accounted for

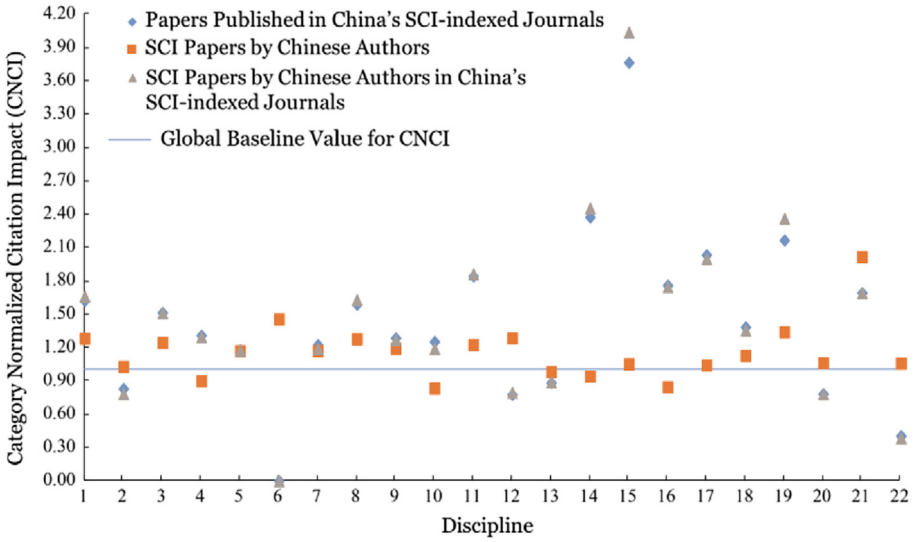

FIG. 4.4 – Comparison of CNCI across disciplines for global, China's SCI journals, and Chinese-authored SCI papers in 2022. 1: Agricultural Sciences; 2: Biology & Biochemistry; 3: Chemistry; 4: Clinical Medicine; 5: Computer Science; 6: Economics & Business*; 7: Engineering; 8: Environment/Ecology; 9: Geosciences; 10: Immunology; 11: Materials Science; 12: Mathematics; 13: Microbiology; 14: Molecular Biology & Genetics; 15: Multidisciplinary; 16: Neuroscience & Behavior; 17: Pharmacology & Toxicology; 18: Physics; 19: Plant & Animal Science; 20: Psychiatry/Psychology; 21: Social Sciences; 22: Space Science. Retrieval method – select "research area" in InCites dataset; publication time: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "research papers" and "review articles"; then sequentially retrieve the data of global, China's SCI-indexed journals, Chinese authors, and Chinese-author papers in China's SCI-indexed journals. *For the discipline "economics & business", no papers were published in China's SCI-indexed journals in 2022. Therefore, the CNCI for China's SCI-indexed journals' papers and Chinese-author papers in China's SCI-indexed journals in this discipline is recorded as 0.

more than 60% of the Q1 journal papers published in China's SCI journals. In nine disciplines – "Social Sciences," "Psychiatry & Physiology," "Space Science," "Microbiology," "Chemistry," "Mathematics," "Multidisciplinary," "Computer Science," and "Molecular Biology & Genetics" – Chinese authors contributed over 90% of Q1 journal papers.

There is a significant disparity between the proportion of Q1 journal papers by Chinese authors and those published in Chinese SCI journals. This gap is particularly pronounced in three disciplines: "Materials Science" (59.36%), "Engineering" (53.10%), and "Geosciences" (50.03%). A notable discrepancy exists between the proportion of Q1 publications by Chinese authors and those published in China's SCI journals, with particularly marked disparities observed in three disciplines: "Social Sciences", "Psychiatry and Physiology" and "Space Science". The difference is more obvious in these three disciplines.

Tab. 4.5 – Differences in CNCI between Chinese-authored SCI papers and papers in China's SCI-journals by discipline in 2022.

Difference (R)	Disciplines
$R \leq -1.00$	Multidisciplinary (−2.71), Molecular Biology and Genetics (−1.43)
$-1.00 < R \leq -0.50$	Pharmacology and Toxicology (−0.99), Neuroscience & Behavior (−0.92), Plant and Animal Science (−0.83), Materials Science (−0.62)
$-0.50 < R \leq 0$	Immunology (−0.42), Clinical Medicine (−0.41), Agricultural Sciences (−0.34), Environment/Ecology (−0.31), Chemistry (−0.27), Physics (−0.26), Geosciences (−0.09), Engineering (−0.05), Computer Science (−0.01)
$0 < R \leq 0.50$	Microbiology (0.10), Biology and Biochemistry (0.20), Psychiatry and Physiology (0.28), Social Sciences (0.32)
$0.50 < R \leq 1.00$	Mathematics (0.51), Space Science (0.65)
$R > 1.00$	Economics & Business (1.46)

Note: Difference R = CNCI of SCI papers published by Chinese authors – CNCI of papers published by China's SCI journals.
Disciplines are arranged in ascending order of R.

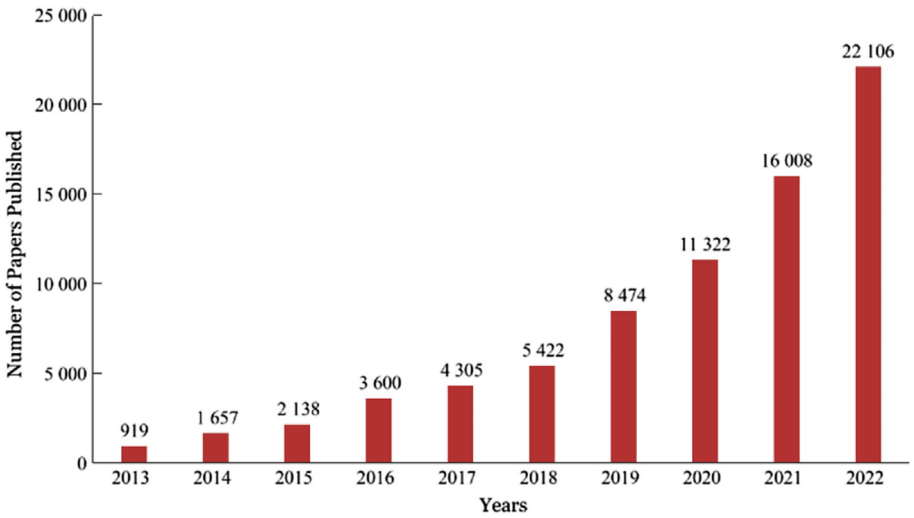

Fig. 4.5 – Number of Q1 journal papers published by China's SCI journals from 2013 to 2022. Retrieval method – select "research area" in InCites dataset; publication time: 2013–2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "research papers" and "review articles"; then sequentially retrieve the data of papers published by China's SCI-indexed journals.

TAB. 4.6 – Number of Q1 journal papers by discipline for global publications, China's SCI journals, and Chinese authors in 2022.

No.	Discipline	Global Q1 journal papers (A)	Q1 Journal papers published in China's SCI journals (B)	Proportion (B/A × 100%)/%	Q1 Journal papers authored by Chinese researchers (C)	Proportion (C/A × 100%)/%	Ratio of chinese Authors to china's SCI journals (C/B)	Q1 journal papers authored by Chinese researchers in Chinese Q1 journals (D)	Proportion (D/B × 100%)/%
1	Agricultural Sciences	43 455	1365	3.14	19 156	44.08	14.03	1117	81.83
2	Biology & Biochemistry	40 983	321	0.78	12 722	31.04	39.63	281	87.54
3	Chemistry	102 133	2591	2.54	45 206	44.26	17.45	2441	94.21
4	Clinical Medicine	100 431	947	0.94	16 717	16.65	17.65	749	79.09
5	Computer Science	31 105	525	1.69	15 462	49.71	29.45	481	91.62
6	Economics & Business	17 065	0	0.00	3745	21.95	–	0	–
7	Engineering	128 057	2520	1.97	67 999	53.10	26.98	2064	81.90
8	Environment/Ecology	52 153	1068	2.05	23 511	45.08	22.01	884	82.77
9	Geosciences	37 786	1550	4.10	18 904	50.03	12.20	1286	82.97
10	Immunology	20 580	191	0.93	5428	26.38	28.42	117	61.26
11	Materials Science	88 196	5018	5.69	52 353	59.36	10.43	4206	83.82
12	Mathematics	22 276	101	0.45	7589	34.07	75.14	94	93.07
13	Microbiology	8618	95	1.10	2508	29.10	26.40	91	95.79
14	Molecular Biology & Genetics	21 886	601	2.75	7516	34.34	12.51	544	90.52
15	Multidisciplinary	641	14	2.18	184	28.71	13.14	13	92.86
16	Neuroscience & Behavior	19 368	600	3.10	2858	14.76	4.76	367	61.17
17	Pharmacology & Toxicology	34 417	718	2.09	12 443	36.15	17.33	644	89.69
18	Physics	34 411	2544	7.39	12 257	35.62	4.82	2199	86.44
19	Plant & Animal Science	50 017	1332	2.66	17 909	35.81	13.45	989	74.25
20	Psychiatry/Psychology	28 156	1	0.00	5829	20.70	5829.00	1	100.00
21	Social Sciences	52 894	1	0.00	8128	15.37	8128.00	1	100.00
22	Space Science	12 591	3	0.02	2263	17.97	754.33	3	100.00
	Total	947 219	22 106	2.33	360 687	38.08	16.32	18 572	84.01

Note: Retrieval method – select "Research Area" in InCites dataset; publication date: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "Article" and "Review"; then sequentially retrieve the data of global, China's SCI-indexed journals, Chinese authors, and Chinese-author papers in China's SCI-indexed journals. Ranked in alphabetical order of disciplines.

4.1.3 International Collaboration in Papers Published in China's SCI Journals

In 2022, 18.13% of papers published in China's SCI journals involved international collaboration, 8.34 pp lower than the global proportion of international collaborative papers (26.47%). Similarly, 20.58% of papers authored by Chinese researchers involved international collaboration, 5.89 pp below the global average.

As shown in table 4.7, five disciplines had higher proportions of international collaboration in papers published in China's SCI journals compared to the global average for the same disciplines. These disciplines were "Social Sciences," "Immunology," "Multidisciplinary," "Plant & Animal Science," and "Agricultural Sciences." For Chinese authors, the proportion of international collaboration in papers within the disciplines of "Social Sciences," "Economics & Business," and "Psychiatry & Physiology" was higher than the global average for the respective disciplines. Across disciplines, the proportion of international collaboration in papers authored by Chinese researchers in China's SCI journals closely aligned with the proportion of international collaboration in papers published in China's SCI journals.

4.2 Institutional Distribution of Publications in China's SCI Journals

4.2.1 Global Institutional Distribution of Publications in China's SCI Journals

In 2022, a total of 93 385 articles[5] were published in Chinese SCI journals by 5022 institutions from 118 countries/regions. Among these, the top 10 countries by the number of contributing institutions were China,[6] the United States, India, Russia, Spain, France, Japan, Germany, the Republic of Korea, and Italy. In terms of publication volume, China had 1263 institutions contributing 32 551 papers, accounting for 86.66% of the total publications in China's SCI journals. The United States had 629 institutions contributing 2784 papers, representing 7.41% of the total. Institutions from Germany, the Republic of Korea, Japan, India, and France each contributed more than 1% of the total. Moreover, although the number of publishing institutions was relatively limited, the publications from Australia (832 papers by 79 institutions), the United Kingdom (772 papers by 124 institutions), and Canada (550 papers by 87 institutions) each accounted for over 1% of the total publications in China's SCI journals.

In terms of the proportion of highly cited papers in China's SCI journals, China (88.92%) and the United States (13.05%) ranked first and second among the top 10

[5]Publication counts include duplicate counts, *i.e.*, a single publication is attributed to more than one institution if authors from different institutions are involved.

[6]All references to "for China's publishing institutions exclude those in Hong Kong SAR, Macao SAR, and Taiwan.

TAB. 4.7 – Proportion of international collaboration in papers by discipline in 2022 for global publications, China's SCI journals, and Chinese authors.

No.	Discipline	Global proportion of international collaboration papers (A)/%	Proportion of international collaboration papers in China's SCI journals (B)/%	Difference ($B-A$)/ PP	Proportion of international collaboration papers authored by Chinese researchers (C)/%	Difference ($C-A$)/ PP	Proportion of international collaboration papers authored by Chinese researchers in China's SCI journals (D)/%	Difference ($D-B$)/ PP
1	Agricultural Sciences	24.80	26.37	1.57	21.44	−3.36	23.19	−3.18
2	Biology & Biochemistry	27.17	14.45	−12.72	18.56	−8.61	12.94	−1.51
3	Chemistry	22.97	9.34	−13.63	15.85	−7.12	8.89	−0.45
4	Clinical Medicine	22.15	16.82	−5.33	13.06	−9.09	14.07	−2.75
5	Computer Science	30.30	20.38	−9.92	28.25	−2.05	19.30	−1.08
6	Economics & Business	38.74	0.00	−38.74	42.01	3.27	0.00	0.00
7	Engineering	25.07	20.02	−5.05	21.43	−3.64	18.31	−1.71
8	Environment/Ecology	31.88	21.51	−10.37	25.47	−6.41	19.53	−1.98
9	Geosciences	34.43	19.80	−14.63	27.76	−6.67	18.05	−1.75
10	Immunology	28.18	42.41	14.23	15.07	−13.11	32.48	−9.93
11	Materials Science	24.17	20.32	−3.85	18.92	−5.25	18.40	−1.92
12	Mathematics	30.85	16.44	−14.41	23.27	−7.58	14.91	−1.53
13	Microbiology	28.30	9.47	−18.83	19.10	−9.20	9.89	0.42
14	Molecular Biology & Genetics	26.79	25.12	−1.67	16.86	−9.93	24.61	−0.51
15	Multidisciplinary	30.24	42.86	12.62	21.85	−8.39	38.46	−4.40
16	Neuroscience & Behavior	27.57	17.67	−9.90	17.29	−10.28	14.99	−2.68
17	Pharmacology & Toxicology	23.91	13.86	−10.05	12.41	−11.50	13.08	−0.78
18	Physics	29.00	14.96	−14.04	21.63	−7.37	13.03	−1.93
19	Plant & Animal Science	30.94	34.74	3.80	23.75	−7.19	32.67	−2.07
20	Psychiatry/ Psychology	27.99	0.00	−27.99	29.48	1.49	0.00	0.00
21	Social Sciences	23.53	100.00	76.47	32.93	9.40	100.00	0.00
22	Space Science	56.07	23.48	−32.59	53.59	−2.48	22.27	−1.21
	Total	26.47	18.13	−8.34	20.58	−5.89	16.15	−1.98

Note: Retrieval method – select "Research Area" in InCites dataset; publication date: 2022; Essential Science Indicators (ESI) as the discipline classification system; literature types: "Article" and "Review"; then sequentially retrieve the data of global, China's SCI-indexed journals, Chinese authors, and Chinese-author papers in China's SCI-indexed journals. Ranked in alphabetical order of disciplines.

Tab. 4.8 – Publication metrics of top 10 countries by institutional participation in China's SCI journals in 2022.

No.	Country	No. of institutions	No. of SCI papers	Proportion of SCI papers in China's SCI journals (%)	No. of highly cited papers	Proportion of highly cited papers in China's SCI journals (%)
1	China	1263	32 551	86.66	1083	88.92
2	US	629	2784	7.41	159	13.05
3	India	297	444	1.18	33	2.71
4	Russia	172	248	0.66	16	1.31
5	Spain	167	302	0.80	13	1.07
6	France	163	433	1.15	17	1.40
7	Japan	155	502	1.34	12	0.99
8	Germany	144	701	1.87	38	3.12
9	ROK	139	557	1.48	30	2.46
10	Italy	135	332	0.88	16	1.31

Note: Data was retrieved from the InCites database by selecting "Organization" with the publication date set to "2022", using the ESI classification system and document types "Article" and "Review." Data for the top 10 countries by the number of institutions was collected, using benchmark values for comparison.

The total number of papers published in China's SCI journals was 37 561, and the total number of highly cited papers in these journals was 1218.

countries by the number of contributing institutions. Germany (3.12%), India (2.71%), the Republic of Korea (2.46%), France (1.40%), Russia (1.31%), Italy (1.31%), and Spain (1.07%) also contributed over 1% (table 4.8). Additionally, institutions from Australia (4.68%), the United Kingdom (4.27%), and Canada (2.13%) had a notable proportion of highly cited papers.

Among the top 100 institutions publishing in China's SCI journals by publication volume, 95 were from China. The University of California System in the United States ranked 49th with 274 papers, followed by the French National Centre for Scientific Research (Centre National de la Recherche Scientifique) at 57th with 241 papers, UDICE-French Research Universities at 69th with 201 papers, the National University of Singapore at 90th with 168 papers, and the United States Department of Energy at 100th with 159 papers.

Ranked by the number of highly cited papers, all top 40 institutions (with 15 or more highly cited papers) in China's SCI journals were all China-affiliated.

4.2.2 Distribution of China's Institutions Publishing in China's SCI Journals

According to InCites data (table 4.9), in 2022, 1263 China's institutions published a total of 32 551 papers in China's SCI journals. During the same period, 1546 China's institutions published a total of 718 598 international papers.

Tab. 4.9 – Comparison analysis of SCI papers from Chinese institutions *vs.* publications in China's SCI journals in 2022.

Metric*	SCI papers by China's institutions	Papers by China's institutions published in China's SCI journals
No. of Institutions	1546	1263
No. of WoS Papers	718 598	32 551
Proportion of Global Papers (%)	31.45	1.42
Proportion of Cited Papers (%)	63.19	65.17
Total Citations	1 958 935	126 641
Citation Impact	2.73	3.89
Impact Relative to World (IRW)**	1.25	1.78
Category Normalized Citation Impact	1.18	1.52
Proportion of Top 1% Cited Papers (%)	1.44	2.71
Proportion of Top 10% Cited Papers (%)	11.04	15.57
Proportion of International Collaboration Papers (%)	20.62	16.15
Proportion of Horizontal Collaboration Papers (%)	1.97	2.39
Proportion of Highly Cited Papers (%)	1.58	3.33
Proportion of Hot Papers (%)	0.16	0.35
Proportion of Open Access Papers (%)	44.98	43.26
Proportion of Gold Open Access Papers (%)	35.94	26.74

Notes: Data were retrieved from the InCites database by selecting "Institutions" with a time window set to 2022, using the ESI classification system and document types "Research Articles" and "Reviews Articles." Data for China's institutions and China's SCI-indexed journals were collected sequentially.
*Benchmark values were used.
**"Impact Relative to World (IRW)" represents the ratio of citation impact for a specific group of papers to the global average citation impact. The global average is always equal to 1. A value greater than 1 indicates that the average citation frequency of the group is higher than the global average, while a value less than 1 indicates a lower citation frequency.

The overall quality of papers published by China's institutions in China's SCI journals was higher than that of SCI papers published by China's institutions in 2022. The "Citation impact" (3.89), "relative impact compared to the Global Average" (1.78), and "category normalized citation impact" (CNCI) (1.52) for papers published by China's institutions in China's SCI journals all exceeded the corresponding metrics for all SCI papers by China's institutions (2.73, 1.25, and 1.18, respectively). Moreover, both the CNCI for papers published by China's institutions in China's SCI journals and the CNCI for all SCI papers published by China's institutions exceeded the global average benchmark of 1.00. Additionally, the proportion of papers among the top 1% most-cited globally (2.71%) and the proportion among the top 10% most-cited globally (15.57%) for papers published by China's institutions in China's SCI journals were higher than those for all SCI papers published by China's institutions (1.44% and 11.04%, respectively).

The proportion of international collaboration papers among all papers by China's institutions was 20.62%, higher than the proportion of international collaboration papers by China's institutions published in China's SCI journals (16.15%). Regarding horizontal

collaboration,[7] the proportion of horizontal collaboration papers published in China's SCI journals (2.39%) was higher than the overall proportion for China's institutions (1.97%).

In 2022, the proportion of highly cited papers published by China's institutions in domestic SCI journals stood at 3.33%, surpassing the highly cited papers rate of their overall publications (1.58%). The percentage of highly cited papers published in China's SCI journals has shown a noticeable increase, gradually widening the gap between the two. The proportion of hot papers for China's institutions and their publications in China's SCI journals remained low, at 0.16% and 0.35%, respectively.

Regarding open access, the overall proportion of open-access papers published by China's institutions (44.98%) and the proportion of gold open-access papers (35.94%) were higher than the corresponding proportions for papers published in China's SCI journals (43.26% and 26.74%).

4.2.3 Top 50 China's Institutions Publishing in China's SCI Journals

The global publication performance of China's institutions differs from their publication performance in China's SCI journals. This section analyzes the top 50[8] institutions based on the number of papers they published in China's SCI journals.

4.2.3.1 Publication Volume

In 2022, the top ten institutions with the highest number of papers published in China's SCI journals were the Chinese Academy of Sciences (6398 papers), University of the Chinese Academy of Sciences (2789 papers), Tsinghua University (1096 papers), University of Science and Technology of China (1038 papers), Zhejiang University (1026 papers), Shanghai Jiao Tong University (999 papers), Peking University (979 papers), Sun Yat-sen University (764 papers), Fudan University (748 papers), and Huazhong University of Science and Technology (745 papers), as shown in table 4.10.

Among the top 50 institutions, the institutions with highest proportion of papers in China's SCI journals were University of the Chinese Academy of Sciences (9.23%), University of Science and Technology of China (9.16%), Chinese Academy of Sciences (8.52%), University of Science and Technology Beijing (8.51%), China University of Petroleum (8.46%), Laoshan Laboratory (8.15%), Northwestern Polytechnical University (7.44%), Tsinghua University (7.11%), Nanjing University (6.75%), and Beihang University (6.67%).

The institutions with the lowest proportion of their total SCI papers published in China's SCI journals were Capital Medical University (3.40%), Southeast University (3.61%), Shandong University (3.83%), Tongji University (3.85%), South China University of Technology (4.03%), University of Electronic Science and Technology of China (4.08%), Xi'an Jiaotong University (4.08%), Ministry of Agriculture and Rural Affairs of the

[7]Horizontal collaboration includes papers with one or more authors affiliated with institutions marked as "corporate entities."

[8]Two institutions are both ranked 49th in the number of articles published in China's SCI-indexed journals.

TAB. 4.10 – 2022 Global SCI and China's SCI journal publication data for the top 50 China's Institutions: number of papers, highly cited papers, citation impact, and international collaboration percentages.

No.	Institution	Total no. of papers published globally (A)	No. of papers published in China's SCI journals (B)	Proportion ($B/A \times 100\%$)/ %	No. of highly cited papers published globally (C)	No. of highly cited papers in China's SCI journals (D)	Proportion ($D/C \times 100\%$)/ %	Citation impact for the institution's global publications (E)	Citation impact for the institution's in China's SCI journals (F)	Difference in Value ($F - E$)	Percentage of international collaboration for global publications (G)/%	Percentage of international collaboration for publications in China's SCI journals (H)	Difference in value ($H - G$)/ %
1	Chinese Academy of Sciences	75 055	6398	8.52	1513	189	12.49	3.35	3.49	0.14	26.03	17.57	-8.46
2	University of the Chinese Academy of Sciences	30 228	2789	9.23	547	60	10.97	3.21	3.22	0.02	21.90	14.52	−7.38
3	Tsinghua University	15 422	1096	7.11	381	52	13.65	3.86	5.54	1.68	28.99	18.43	−10.56
4	University of Science and Technology of China	11 328	1038	9.16	226	17	7.52	3.62	3.23	−0.39	25.04	14.74	−10.30
5	Zhejiang University	21 078	1026	4.87	391	38	9.72	3.08	4.48	1.40	25.57	18.71	−6.86
6	Shanghai Jiao Tong University	20 159	999	4.96	356	31	8.71	3.03	4.14	1.11	25.99	20.92	−5.07
7	Peking University	15 604	979	6.27	310	32	10.32	3.11	3.47	0.36	30.56	22.17	−8.39
8	Sun Yat–sen University	15 682	764	4.87	253	19	7.51	2.88	3.78	0.91	25.05	19.63	−5.42
9	Fudan University	14 107	748	5.30	253	31	12.25	2.98	4.27	1.29	24.73	19.65	−5.08
10	Huazhong University of Science and Technology	14 069	745	5.30	274	30	10.95	3.21	4.61	1.41	20.18	20.81	0.63
11	Central South University	14 272	682	4.78	290	36	12.41	3.22	5.92	2.71	21.19	19.21	−1.98
12	Sichuan University	14 792	662	4.48	258	35	13.57	2.98	5.89	2.91	19.40	18.43	−0.97
13	Zhengzhou University	10 918	626	5.73	343	56	16.33	3.99	8.45	4.46	19.30	21.25	1.95
14	Nanjing University	9219	622	6.75	207	26	12.56	3.54	4.55	1.02	25.81	18.65	−7.16
15	Tianjin University	9586	615	6.42	190	18	9.47	3.40	4.03	0.63	22.36	16.91	−5.45

Tab. 4.10 – (continued).

16	Harbin Institute of Technology	11 180	563	5.04	229	24	10.48	3.36	4.43	1.08	21.26	15.45	−5.81
17	Northwestern Polytechnical University	7234	538	7.44	198	40	20.20	3.86	6.97	3.11	22.31	18.96	−3.35
18	Wuhan University	10 988	525	4.78	290	19	6.55	3.67	4.28	0.61	22.84	20.19	−2.65
19	Xi'an Jiaotong University	12 699	518	4.08	253	21	8.30	3.18	5.32	2.15	23.98	19.50	−4.48
20	Jilin University	9821	507	5.16	168	25	14.88	2.91	4.25	1.34	17.62	17.55	−0.07
21	University of Science and Technology Beijing	5747	489	8.51	90	12	13.33	3.11	4.05	0.94	20.78	18.40	−2.38
22	China University of Petroleum Beijing	5732	485	8.46	92	9	9.78	2.89	3.11	0.22	22.71	17.53	−5.18
23	Institute of Technology	7263	476	6.55	262	23	8.78	4.14	5.09	0.95	24.74	15.34	–9.40
24	Shandong University	11 821	453	3.83	189	22	11.64	2.95	5.41	2.46	21.82	21.41	−0.41
25	Beihang University	6743	450	6.67	115	12	10.43	3.04	3.39	0.35	24.40	17.11	−7.29
26	Chinese Academy of Medical Sciences & Peking Union Medical College	9282	447	4.82	130	12	9.23	2.57	4.98	2.41	15.41	16.11	0.70
27	Chongqing University	8396	441	5.25	240	21	8.75	3.77	5.84	2.07	21.93	19.95	−1.98
28	Tongji University	10 737	413	3.85	180	21	11.67	3.08	5.08	2.00	24.03	20.82	−3.21
29	China University of Geosciences	6798	410	6.03	136	12	8.82	3.22	3.47	0.25	31.57	23.66	−7.91
30	Chinese Academy of Agricultural Sciences	7062	409	5.79	118	16	13.56	2.73	3.89	1.16	26.65	26.65	0.00
31	Xiamen University	6647	386	5.81	136	16	11.76	3.33	4.37	1.04	27.98	23.83	−4.15
32	Soochow University	7445	382	5.13	122	19	15.57	3.05	5.68	2.62	19.91	18.59	−1.32
33	Southeast University	10 293	372	3.61	178	24	13.48	3.13	4.81	1.68	27.18	19.62	−7.56

TAB. 4.10 – (continued).

No.	Institution	Total no. of papers published globally (A)	No. of papers published in China's SCI journals (B)	Proportion (B/ $A \times 100\%$)/ %	No. of highly cited papers published globally (C)	No. of highly cited papers in China's SCI journals (D)	Proportion (D/ $C \times 100\%$)/ %	Citation impact for the institution's global publications (E)	Citation impact for the institution's in China's SCI journals (F)	Difference in Value ($F - E$)	Percentage of international collaboration for global publications (G)/%	Percentage of international collaboration for publications in China's SCI journals (H)	Difference in value ($H - G$)/ %
34	Shenzhen University	7012	370	5.28	175	18	10.29	3.74	5.05	1.31	30.18	21.35	−8.83
35	Ministry of Agriculture and Rural Affairs of the People's Republic of China	8894	369	4.15	145	28	19.31	2.73	6.56	3.83	19.26	20.87	1.61
36	Northeastern University	5880	360	6.12	99	12	12.12	2.93	4.59	1.66	18.33	14.72	−3.61
37	Dalian University of Technology	6943	351	5.06	177	11	6.21	3.35	4.18	0.83	21.91	14.53	−7.38
38	Nankai University	5313	341	6.42	155	16	10.32	4.15	6.00	1.85	21.33	20.53	−0.80
39	Shanghai University	5134	339	4.40	126	23	18.25	3.36	5.40	2.05	25.38	23.89	−1.49
40	South China University of Technology	8247	332	4.03	189	18	9.52	3.59	5.35	1.76	20.75	15.96	−4.79
41	Southern University of Science and Technology	5194	314	6.05	127	16	12.60	3.89	5.18	1.29	34.87	26.75	−8.12
42	Hunan University	5317	303	5.70	191	26	13.61	4.57	8.06	3.49	27.06	24.42	−2.64
43	China Agricultural University	5286	300	5.68	125	11	8.80	2.98	3.34	0.36	26.62	20.67	−5.95
44	Beijing Normal University	5715	295	5.16	102	8	7.84	2.74	3.05	0.30	31.11	18.98	−12.13
45	University of Electronic Science and Technology of China	7164	292	4.08	251	17	6.77	4.08	5.58	1.49	29.54	23.97	−5.57
46	Lanzhou University	5683	280	4.93	79	7	8.86	2.77	4.24	1.48	23.40	18.93	−4.47
47	Capital Medical University	8141	277	3.40	72	9	12.50	1.90	2.79	0.89	16.79	16.97	0.18

Tab. 4.10 – (continued).

48	Ocean University of China	4176	270	6.47	66	6	9.09	2.78	2.45	−0.33	26.82	19.63	−7.19
49	Nanjing University of Aeronautics and Astronautics	5042	262	5.20	82	13	15.85	2.84	6.65	3.80	21.66	14.12	−7.54
50	Laoshan Laboratory	3216	262	8.15	25	2	8.00	2.25	1.76	−0.49	24.53	15.27	−9.26

Notes: The data was retrieved using the InCites database by selecting "Organizations," with the publication date set to 2022 and the ESI classification system. Document types included "Articles" and "Reviews." Data for global SCI publications and China's SCI-indexed journal publications were collected sequentially, selecting the top 50 China's institutions based on publication volume.
The InCites database was updated on July 28, 2023, with Web of Science data current as of June 30, 2023. The data retrieval occurred on August 1, 2023.

People's Republic of China (4.15%), Sichuan University (4.48%), Wuhan University (4.78%), and Central South University (4.78%).

4.2.3.2 Number of Highly Cited Papers

In 2022, China's top 11 institutions with the highest number of highly cited papers published in China's SCI journals were the Chinese Academy of Sciences (189 papers), University of the Chinese Academy of Sciences (60 papers), Zhengzhou University (56 papers), Tsinghua University (52 papers), Northwestern Polytechnical University (40 papers), Zhejiang University (38 papers), Central South University (36 papers), Sichuan University (35 papers), Peking University (32 papers), Shanghai Jiao Tong University (31 papers), and Fudan University (31 papers), as shown in table 4.10.

The proportion of highly cited papers published in China's SCI journals relative to the total number of highly cited papers by an institution reached a maximum of 20.20%. The top 10 institutions by this metric were Northwestern Polytechnical University (20.20%), Ministry of Agriculture and Rural Affairs of the People's Republic of China (19.31%), Shanghai University (18.25%), Zhengzhou University (16.33%), Nanjing University of Aeronautics and Astronautics (15.85%), Soochow University (15.57%), Jilin University (14.88%), Tsinghua University (13.65%), Hunan University (13.61%), and Sichuan University (13.57%).

4.2.3.3 Citation Impact

In 2022, the top ten institutions with the highest citation impact for papers published in China's SCI journals were Zhengzhou University (8.45), Hunan University (8.06), Northwestern Polytechnical University (6.97), Nanjing University of Aeronautics and Astronautics (6.65), Ministry of Agriculture and Rural Affairs (6.56), Nankai University (6.00), Central South University (5.92), Sichuan University (5.89), Chongqing University (5.84), and Soochow University (5.68), as shown in table 4.10.

For 47 institutions, the citation impact of papers published in China's SCI journals was higher than the citation impact of their overall SCI papers. The 10 institutions with the largest differences were Zhengzhou University (4.46), Ministry of Agriculture and Rural Affairs (3.83), Nanjing University of Aeronautics and Astronautics (3.80), Hunan University (3.49), Northwestern Polytechnical University (3.11), Sichuan University (2.91), Central South University (2.71), Soochow University (2.62), Shandong University (2.46), and Chinese Academy of Medical Sciences & Peking Union Medical College (2.41). Three institutions had lower citation impacts for papers published in China's SCI-journals compared to their overall SCI papers, with differences for Laoshan Laboratory (−0.49), University of Science and Technology of China (−0.39), and Ocean University of China (−0.33).

4.2.3.4 Percentage of International Collaboration Papers

The top 10 institutions with the highest percentage of international collaboration papers in China's SCI journals (ranking in descending order) were Southern University of Science and Technology (26.75%), Chinese Academy of Agricultural Sciences (26.65%), Hunan University (24.42%), University of Electronic Science and Technology of China (23.97%),

Shanghai University (23.89%), Xiamen University (23.83%), China University of Geosciences (23.66%), Peking University (22.17%), Shandong University (21.41%), and Shenzhen University (21.35%), as shown in table 4.10.

There were six institutions that had equal or higher percentages of international collaboration papers in China's SCI journals compared to their overall SCI papers. The largest differences were observed for Zhengzhou University (1.95 pp), Ministry of Agriculture and Rural Affairs (1.61 pp), Chinese Academy of Medical Sciences & Peking Union Medical College (0.70 pp), Huazhong University of Science and Technology (0.63 pp), Capital Medical University (0.18 pp), and Chinese Academy of Agricultural Sciences (0.00 pp). For the remaining 44 institutions, the percentage of international collaboration papers in China's SCI journals was lower than their overall SCI papers, with differences ranging from −12.13 to −0.07 pp.

4.3 Academic Impact of Papers Published in China's SCI Journals

In 2022, 14 countries globally published more than 50 000 SCI papers. This section compares key impact metrics (total citations, citation impact, cited paper percentage, and CNCI) of their domestic journals to evaluate China's SCI journals' international competitiveness.

4.3.1 Comparative Analysis of Academic Influence in Scientific Journal Publications Among Major Research-Producing Countries

Among the 14 leading research nations (table 4.11), China ranked first in the number of papers authored by its researchers and fifth in the number of papers published in its SCI journals. China's SCI journals ranked first in both citation impact and CNCI, with no change in rankings compared to 2021. The United States ranked second in the number of papers authored by its researchers, first in the number of SCI journals and their papers, and fourth in both citation impact and CNCI. The United Kingdom ranked second in the number of SCI journals and their papers, fourth in the number of papers authored by its researchers, and third in both citation impact and CNCI. Germany ranked fourth in the number of SCI journals and their papers, third in the number of papers authored by its researchers, and fifth in both citation impact and CNCI. India ranked fifth in the number of papers authored by its researchers, 11th in the number of SCI journal papers, and 14th in both citation impact and CNCI.

For the remaining countries, significant differences were observed between the number of papers authored and the number of papers published in national SCI journals. Canada ranked 8th in the number of authored papers but 12th and 13th in the number of SCI journals and the number of papers published in those journals, respectively. Its citation impact and CNCI both ranked 9th. The Netherlands ranked 14th in the number of authored papers but 3rd in both the number of SCI journals and the number of papers published in those journals, with its citation impact and CNCI both ranking second.

Tab. 4.11 – Academic impact of papers published by major SCI paper-producing countries in 2022.

No.	Country	No. of SCI journals	No. of SCI papers authored by the country (A)	No. of papers published in the country's SCI journals (B)	Ratio (B/A)	Total citation frequency of the country's SCI journals (C)	Citation impact of the country's SCI journals (C/B)	Proportion of Cited Papers in the country's SCI journals (%)	CNCI of the country's SCI journals
1	China	235	740 776	37 561	0.05	145 675	3.88	66.12	1.51
2	USA	4175	448 110	689 514	1.54	1 591 927	2.31	58.72	1.09
3	Germany	775	130 924	116 911	0.89	270 970	2.32	57.69	0.94
4	UK	3020	130 246	530 431	4.07	1 265 999	2.39	61.23	1.11
5	India	94	123 314	12 684	0.10	7825	0.62	30.01	0.29
6	Italy	121	96 292	16 134	0.17	26 648	1.65	50.30	0.88
7	Japan	252	92 662	22 937	0.25	24 593	1.07	45.12	0.53
8	Canada	120	86 225	9321	0.11	10 516	1.13	46.69	0.64
9	Australia	156	84 433	10 943	0.13	15 525	1.42	49.27	0.77
10	France	189	81 989	19 142	0.23	34 668	1.81	55.08	0.84
11	ROK	148	77 666	14 766	0.19	20 748	1.41	49.81	0.62
12	Spain	126	77 281	6151	0.08	6076	0.99	36.51	0.61
13	Brazil	118	57 644	14 744	0.26	14 807	1.00	39.09	0.46
14	The Netherlands	973	50 111	221 605	4.42	568 014	2.56	64.81	1.14

Note: Data was collected from the InCites database by selecting "Research Area" with publication date of 2022 under the ESI classification system. The document types were limited to "Article" and "Review." Data were collected from authors and SCI-indexed journals in each country in turn.

The countries are ranked in descending order by the number of authored papers.

The top five countries by the number of national SCI journals were the USA (4175 journals), the UK (3020 journals), the Netherlands (973 journals), Germany (775 journals), and Japan (252 journals). China had 235 CN-registered SCI journals, ranking 6th. In terms of the ratio of the number of papers published in national SCI journals to the number of papers authored by the country, three countries had a ratio greater than 1, indicating that their national journals published more papers than their researchers authored. These were the Netherlands (4.42), the UK (4.07), and the USA (1.54). Conversely, seven countries had fewer than 20% of their authored papers published in their national SCI journals. These countries were China (0.05), Spain (0.08), India (0.10), Canada (0.11), Australia (0.13), Italy (0.17), and the Republic of Korea (0.19).

1) The top three countries with the highest "Citation Impact" in 2022 were China (3.88), the Netherlands (2.56), and UK (2.39).
2) The top three countries with the highest "Proportion of Cited Papers" were China (66.12%), the Netherlands (64.81%), and UK (61.23%).
3) Four countries had a "CNCI" greater than 1 (*i.e.*, above the global average), ranked as follows: China (1.51), the Netherlands (1.14), UK (1.11), and USA (1.09).

In 2022, 11 countries had more than 1000 highly cited papers authored by their researchers, ranked as follows: China (11 459 papers), USA (6643 papers), UK (2633 papers), Germany (2018 papers), Australia (1832 papers), Italy (1687 papers), India (1614 papers), Canada (1566 papers), France (1314 papers), Spain (1209 papers), and the Netherlands (1059 papers). The top five countries with over 1000 highly cited papers published in their national SCI journals are ranked as follows: USA (8219 papers), UK (6874 papers), the Netherlands (3017 papers), China (1218 papers), and Germany (1146 papers). For the Netherlands, the UK, and the USA, the number of highly cited papers published in their SCI journals exceeded the number of highly cited papers authored by their researchers (table 4.12).

4.3.2 High-Impact Papers Published in China's SCI Journals in 2022

In 2022, 139 of the 235 SCI journals in China (59.15%) published highly cited papers, and 48 journals (20.43%) published hot papers. There were 14 English-language China's SCI journals that had published 20 or more highly cited papers. Among them, *Journal of Materials Science & Technology* ranked first with 125 highly cited papers, followed by *Bioactive Materials* (111 papers) and *Chinese Chemical Letters* (80 papers), as shown in table 4.13.

4.3.3 International Collaborations for Papers in China's SCI Journals

4.3.3.1 China's International Collaborations with Top 13 SCI Paper-producing Countries

In 2022, China's 235 SCI journals published papers with international co-authors from the largest SCI paper-producing countries. From the perspective of the number of international

Tab. 4.12 – Number of highly cited papers authored and published in SCI journals by major SCI paper-producing countries in 2022.

No.	Country	Highly cited papers authored by researchers from the country		Highly cited papers published in the country's SCI journals		Ratio (B/A)
		Number (A)/ Article	Ranking	Number (B)/ Article	Ranking	
1	China	11 459	1	1218	4	0.11
2	USA	6643	2	8219	1	1.24
3	Germany	2018	4	1146	5	0.57
4	UK	2633	3	6874	2	2.61
5	India	1614	7	11	13	0.01
6	Italy	1687	6	120	7	0.07
7	Japan	936	13	43	10	0.05
8	Canada	1566	8	11	13	0.01
9	Australia	1832	5	67	8	0.04
10	France	1314	9	141	6	0.11
11	ROK	988	12	63	9	0.06
12	Spain	1209	10	32	11	0.03
13	Brazil	470	14	28	12	0.06
14	The Netherlands	1059	11	3017	3	2.85

Notes: Data were collected using the InCites database by selecting "Research Areas" with a time window set to 2022 under the ESI classification system. Document types included "Research Articles" and "Reviews Articles." Data were retrieved in turn for authors from each country and for SCI journals from each country.
Countries have been ranked in descending order by the number of papers authored.

collaborations, 212 of China's SCI journals co-authored the most papers with authors from the United States, followed by the United Kingdom, Australia, Canada, Germany, and Japan. From the perspective of citations, the percentage of cited papers co-authored with authors from the above countries was higher than the average for China's SCI journals (66.12%). The top five countries with the highest percentage of cited papers included the Republic of Korea (82.37%), India (81.41%), Germany (80.75%), Australia (80.19%), and the United Kingdom (80.08%). From the perspective of category normalized citation impact (CNCI), the CNCI values of all international collaborations were above 1, and countries with CNCI >2 included India (3.49), Australia (2.36), Brazil (2.33), Republic of Korea (2.33), the United Kingdom (2.29), the United States (2.21), Canada (2.15), Spain (2.15), the Netherlands (2.13), Germany (2.11), and Italy (2.01), as listed in table 4.14.

4.3.3.2 Number of Papers with International Collaborations in China's SCI Journals and Their Citation Performance

In 2022, a total of 6809 international co-authorship papers were published in 235 China's SCI journals. The number of such papers published in each journal ranged from 1 to 271. The top 10 China's SCI journals with the largest number of international co-authorship

Tab. 4.13 – China's SCI journals with 20 or more highly cited papers in 2022.

No.	Journal title in English	Journal title in Chinese	Language	No. of highly cited papers
1	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	English	125
2	*Bioactive Materials*	生物活性材料 (英文)	English	111
3	*Chinese Chemical Letters*	中国化学快报 (英文版)	English	80
4	*Nano Research*	纳米研究 (英文版)	English	55
5	*Journal of Energy Chemistry*	能源化学 (英文版)	English	50
6	*Nano-Micro Letters*	纳微快报 (英文)	English	50
7	*Journal of Environmental Sciences*	环境科学学报 (英文版)	English	38
8	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	English	35
9	*Molecular Plant*	分子植物 (英文)	English	34
10	*Light-Science & Applications*	光: 科学与应用 (英文)	English	33
11	*Chinese Journal of Catalysis*	催化学报	English	32
12	*Acta Pharmaceutica Sinica B*	药学学报 (英文)	English	30
13	*National Science Review*	国家科学评论 (英文)	English	29
14	*Science Bulletin*	科学通报 (英文版)	English	24

Note: Journals are ranked in descending order by the number of highly cited papers published.

papers included *Journal of Materials Science & Technology* (271), *Nano Research* (236), *Bioactive Materials* (187), *Journal of Energy Chemistry* (147), *Chinese Chemical Letters* (118), *Journal of Environmental Sciences* (112), *NPJ Computational Materials* (104), *Light-Science & Applications* (101), *Horticulture Research* (99), and *Geoscience Frontiers* (98), as listed in table 4.15.

The top 10 China's SCI journals ranked by the percentage of international co-authorship papers included *Fungal Diversity* (93.33%), *Marine Life Science & Technology* (67.74%), *Journal of Systematics and Evolution* (62.65%), *Geoscience Frontiers* (57.65%), *Molecular Plant* (57.14%), *Journal of Ocean Engineering and Science* (52.46%), *Infectious Diseases of Poverty* (45.95%), *Journal of Sport and Health Science* (45.71%), *IEEE/CAA Journal of Automatica Sinica* (45.00%), and *Digital Communications and Networks* (44.66%), as listed in table 4.16.

The top 10 China's SCI journals ranked by the citation impact of co-authorship papers included *Nano-Micro Letters* (26.81), *Computational Visual Media* (24.07), *Signal Transduction and Targeted Therapy* (18.89), *Frontiers of Mechanical Engineering* (14.50), *Science Bulletin* (14.43), *International Journal of Extreme Manufacturing* (13.67), *Cell Research* (13.44), *Fungal Diversity* (13.00), *Advanced Photonics* (12.50), and *InfoMat* (12.39), as listed in table 4.17.

There were 109 China's SCI journals demonstrating a CNCI greater than one for their internationally co-authored papers. This indicated that their citation performance was above the global disciplinary average. The top 10 China's SCI journals ranked by their CNCI values included *Fungal Diversity* (8.35), *Nano-Micro Letters* (7.72), *Molecular Plant*

TAB. 4.14 – China's international collaborations with the top 13 SCI papers produced countries/regions in 2022.

No.	Country/Region	No. of China's SCI journals involving international collaborations	No. of international collaborations	Times cited	% Papers cited	CNCI
1	USA	212	2237	12 709	77.11	2.21
2	UK	181	713	4469	80.08	2.29
3	Australia	165	737	4769	80.19	2.36
4	Canada	165	466	2691	77.68	2.15
5	Germany	148	613	3487	80.75	2.11
6	Japan	137	400	1908	76.75	1.75
7	France	126	345	1501	77.39	1.80
8	ROK	110	312	1958	82.37	2.33
9	Italy	101	249	1233	78.71	2.01
10	Spain	94	223	1099	76.68	2.15
11	India	93	199	2181	81.41	3.49
12	Dutch	83	166	828	79.52	2.13
13	Brazil	55	113	598	75.22	2.33

Note: The retrieval was performed based on "Publication Sources" in the InCites dataset; publication time: 2022; Essential Science Indicators (ESIs) as the discipline classification system; literature types: "Article" and "Review". The data of international collaborations of China's SCI journals with each country were sequentially retrieved. Ranked in descending order based on the number of China's SCI journals involving international collaborations.

TAB. 4.15 – Top 10 China's SCI journals ranked by the number of international co-authored papers in 2022 (all in English-language).

No.	Title in English	Title in Chinese	No. of international co-authored papers
1	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	271
2	*Nano Research*	纳米研究 (英文版)	236
3	*Bioactive Materials*	生物活性材料 (英文)	187
4	*Journal of Energy Chemistry*	能源化学 (英文版)	147
5	*Chinese Chemical Letters*	中国化学快报 (英文版)	118
6	*Journal of Environmental Sciences*	环境科学学报 (英文版)	112
7	*NPJ Computational Materials*	计算材料学	104
8	*Light-Science & Applications*	光：科学与应用 (英文)	101
9	*Horticulture Research*	园艺研究 (英文)	99
10	*Geoscience Frontiers*	地学前缘 (英文版)	98

Note: Ranked in descending order based on the number of international co-authored papers.

Tab. 4.16 – Top 10 China's SCI journals ranked by the percentage of international co-authored papers published in 2022 (all in English-language).

No.	Title in English	Title in Chinese	% of published international co-authored papers
1	*Fungal Diversity*	真菌多样性 (英文)	93.33
2	*Marine Life Science & Technology*	海洋生命科学与技术 (英文)	67.74
3	*Journal of Systematics and Evolution*	植物分类学报	62.65
4	*Geoscience Frontiers*	地学前缘 (英文版)	57.65
5	*Molecular Plant*	分子植物 (英文)	57.14
6	*Journal of Ocean Engineering and Science*	海洋工程与科学 (英文)	52.46
7	*Infectious Diseases of Poverty*	贫困所致传染病 (英文)	45.95
8	*Journal of Sport and Health Science*	运动与健康科学 (英文)	45.71
9	*IEEE/CAA Journal of Automatica Sinica*	自动化学报 (英文版)	45.00
10	*Digital Communications and Networks*	数字通信与网络 (英文)	44.66

Note: Ranked in descending order based on the percentage of international co-authorship papers.

Tab. 4.17 – Top 10 China's SCI journals ranked by the citation impact of international co-authorship papers in 2022 (all in English-language).

No.	Title in English	Title in Chinese	Citation impact of international co-authorship papers
1	*Nano-Micro Letters*	纳微快报 (英文)	26.81
2	*Computational Visual Media*	计算可视媒体 (英文)	24.07
3	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	18.89
4	*Frontiers of Mechanical Engineering*	高等学校学术文摘•机械工程前沿 (英文)	14.50
5	*Science Bulletin*	神经科学通报 (英文版)	14.43
6	*International Journal of Extreme Manufacturing*	极端制造 (英文)	13.67
7	*Cell Research*	细胞研究 (英文版)	13.44
8	*Fungal Diversity*	真菌多样性 (英文)	13.00
9	*Advanced Photonics*	先进光子学 (英文)	12.50
10	*InfoMat*	信息材料 (英文)	12.39

Note: Ranked in descending order based on the citation impact of international co-authorship papers.

Tab. 4.18 – Top 10 China's SCI journals ranked by the CNCI of international co-authorship papers in 2022 (all in English-language).

No.	Journal title (English)	Title in Chinese	CNCI
1	*Fungal Diversity*	真菌多样性 (英文)	8.35
2	*Nano-Micro Letters*	纳微快报 (英文)	7.72
3	*Molecular Plant*	分子植物 (英文)	7.36
4	*Computational Visual Media*	计算可视媒体 (英文)	7.25
5	*Science Bulletin*	科学通报 (英文版)	5.61
6	*International Journal of Mining Science and Technology*	矿业科学技术学报 (英文)	5.53
7	*Light-Science & Applications*	光：科学与应用 (英文)	5.12
8	*Cell Research*	细胞研究 (英文版)	5.04
9	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	4.97
10	*Journal of Sport and Health Science*	运动与健康科学 (英文)	4.92

Note: Ranked in descending order based on CNCI values of international co-authorship papers.

(7.36), *Computational Visual Media* (7.25), *Science Bulletin* (5.61), *International Journal of Mining Science and Technology* (5.53), *Light-Science & Applications* (5.12), *Cell Research* (5.04), *Signal Transduction and Targeted Therapy* (4.97), and *Journal of Sport and Health Science* (4.92), as listed in table 4.18.

4.3.4 Annual Reviews of Papers Published in China's SCI Journals

In 2022, a total of 37 561 papers were published in 235 China's SCI journals, with individual journal outputs ranging from 15 to 1262 papers. Tables 4.19–4.24 separately list the top 10 journals ranked by the number of papers, citation counts, citation impact, percentage of papers cited, CNCI, and journal impact factors (JIF).

Tab. 4.19 – Top 10 China's SCI journals ranked by the number of papers published in 2022 (all in English-language).

No.	Title in English	Title in Chinese	No. of papers
1	*Nano Research*	纳米研究 (英文版)	1262
2	*Chinese Physics B*	中国物理 B	1072
3	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	1055
4	*Chinese Chemical Letters*	中国化学快报 (英文版)	1045
5	*Acta Physica Sinica*	物理学报	978
6	*Journal of Environmental Sciences*	环境科学学报 (英文版)	616
7	*Spectroscopy and Spectral Analysis*	光谱学与光谱分析	600
8	*Rare Metal Materials and Engineering*	稀有金属材料与工程	600
9	*Bioactive Materials*	生物活性材料 (英文)	583
10	*Journal of Energy Chemistry*	能源化学 (英文版)	555

Note: Ranked in descending order based on the number of papers published in each journal.

Tab. 4.20 – Top 10 China's SCI journals ranked by the citation counts of papers in 2022 (all in English-language).

No.	Title in English	Title in Chinese	Citation counts
1	*Journal of Materials Science & Technology*	材料科学技术 (英文版)	10 274
2	*Chinese Chemical Letters*	中国化学快报 (英文版)	7939
3	*Bioactive Materials*	生物活性材料 (英文)	7377
4	*Nano Research*	纳米研究 (英文版)	6785
5	*Nano-Micro Letters*	纳微快报 (英文)	5233
6	*Journal of Energy Chemistry*	能源化学 (英文版)	5008
7	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	3366
8	*Chinese Journal of Catalysis*	催化学报	3266
9	*Journal of Environmental Sciences*	环境科学学报 (英文版)	3114
10	*Light-Science & Applications*	光：科学与应用 (英文)	2533

Note: Ranked in descending order based on the citation counts of papers published in each journal.

Tab. 4.21 – Top 10 China's SCI journals ranked by the citation impact of papers in 2022 (all in English-language).

No.	Title in English	Title in Chinese	Citation impact
1	*Nano-Micro Letters*	纳微快报 (英文)	23.79
2	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	16.03
3	*Bioactive Materials*	生物活性材料 (英文)	12.65
4	*Science Bulletin*	科学通报 (英文版)	12.46
5	*Fungal Diversity*	真菌多样性 (英文)	12.33
6	*Chinese Journal of Catalysis*	催化学报 (英文)	12.01
7	*InfoMat*	信息材料 (英文)	11.88
8	*Computational Visual Media*	计算可视媒体 (英文)	11.76
9	*Journal of Advanced Ceramics*	先进陶瓷 (英文)	11.38
10	*Carbon Energy*	碳能源 (英文)	11.30

Note: Ranked in descending order based on the citation impact of papers published in each journal.

Tab. 4.22 – Top 10 China's SCI journals ranked by the percentage of papers cited in 2022 (all in English-language)

No.	Title in English	Title in Chinese	% of Papers cited
1	*Fungal Diversity*	真菌多样性 (英文)	100.00
2	*Cell Research*	细胞研究 (英文版)	100.00
3	*Journal of Sport and Health Science*	运动与健康科学 (英文)	100.00
4	*Nano-Micro Letters*	纳微快报 (英文)	99.09
5	*Green Energy & Environment*	绿色能源与环境 (英文)	97.66
6	*International Journal of Extreme Manufacturing*	极端制造 (英文)	97.62
7	*Molecular Plant*	分子植物 (英文)	97.14
8	*Journal of Advanced Ceramics*	先进陶瓷 (英文)	97.08
9	*Bone Research*	骨研究 (英文)	96.72
10	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	96.67

Note: Ranked in descending order based on the percentage of papers cited in each journal.

Tab. 4.23 – Top 10 China's SCI journals ranked by the CNCI of papers published in 2022 (all in English-language).

No.	Title in English	Title in Chinese	CNCI
1	*Fungal Diversity*	真菌多样性 (英文)	7.94
2	*Molecular Plant*	分子植物 (英文)	7.36
3	*Nano-Micro Letters*	纳微快报 (英文)	6.72
4	*Science Bulletin*	科学通报 (英文版)	5.11
5	*Light-Science & Applications*	光：科学与应用 (英文)	4.86
6	*Chinese Journal of Catalysis*	催化学报	4.30
7	*Journal of Sport and Health Science*	运动与健康科学 (英文)	4.23
8	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	4.21
9	*International Journal of Mining Science and Technology*	矿业科学技术学报 (英文)	4.14
10	*Bioactive Materials*	生物活性材料 (英文)	3.92

Note: Ranked in descending order based on the CNCI value of each journal.

Tab. 4.24 – Top 10 China's SCI journals ranked by the JIF of papers published in 2022 (all in English-language).

No.	Title in English	Title in Chinese	JIF
1	*Cell Research*	细胞研究 (英文版)	44.10
2	*Signal Transduction and Targeted Therapy*	信号转导与靶向治疗 (英文)	39.30
3	*Electrochemical Energy Reviews*	电化学能源评论 (英文)	31.30
4	*Molecular Plant*	分子植物 (英文)	27.50
5	*Nano-Micro Letters*	纳微快报 (英文)	26.60
6	*Cellular & Molecular Immunology*	中国免疫学杂志 (英文版)	24.10
7	*InfoMat*	信息材料 (英文)	22.70
8	*Military Medical Research*	军事医学研究 (英文)	21.10
8	*Protein & Cell*	蛋白质与细胞	21.10
10	*National Science Review*	国家科学评论 (英文)	20.60

Note: Ranked in descending order of JIF.

Chapter 5

Analysis of Papers Published in China's STM Journals Based on Domestic Databases

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Abstract

According to the data from CNKI in 2021, a total of over 1 140 600 cited papers were published in CNKI-indexed China's STM journals, and there were 550 300 funded papers published in China's scientific journals. Among 60 disciplines, the top six ranked in descending order based on the number of papers included "Automation Technology and Computer Technology" (82 885 papers, 7.25%), "Transportation Engineering" (72 328 papers, 6.33%), "Civil Engineering" (66 342 papers, 5.81%), "Internal Medicine" (60 037 papers, 5.25%), "Traditional Chinese Medicine & Herbalism" (59 368 papers, 5.20%), and "Nursing" (47 272 papers, 4.14%).

In 2021, among all publishing affiliations in China's scientific journal papers, higher-education institutions accounted for 34.86% (excluding secondary vocational and tertiary technical institutions); medical institutions accounted for 24.60%; enterprises and research institutions accounted for 15.49% and 10.93% respectively; other institution types – including public institutions, vocational/technical colleges, primary/secondary schools, and kindergartens – collectively accounted for 14.13%.

From 2012 to 2021, a total of 13.5607 million citable papers were published in China's scientific journals, with the times cited totaling 66.8449 million and the average times cited per paper being 4.93. "Medicine, Health, Comprehensive Medicine and Health" had the highest citation frequency (24.889 million times), and "Environmental Science, Safety Science" had the highest average citation frequency per paper (7.33 times). The papers published in journals had the largest total times cited (43 404 200, 64.93%), followed by master's theses (20 420 900 times, 30.55%), doctoral dissertations (3.46%), and conference papers (1.06%).

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This chapter focuses on 4723 China's scientific journals indexed by CNKI[1] between 2012 and 2021 (hereafter referred to as "China's scientific journals" in this chapter). The analysis examines core metrics for selected years (2015, 2018, 2021) and analyzes the publication volume, disciplinary distribution, institutional affiliation patterns, funded papers, and international collaboration trends, as well as the decadal academic impact (2012–2021).[2]

5.1 Disciplinary Distribution of China's Scientific Journals

In 2021, China's scientific journals published a total of 1 140 600 citable articles, showing a decline compared to 1 275 400 articles in 2015 and 1 300 000 articles in 2018. This book refers to the *Impact Factor Annual Report* (*Natural Sciences and Engineering Technologies Journals*) and analyzes the journals in 60 disciplines. Regarding disciplinary distribution of publications in the years 2015, 2018, and 2021, there were 149 200, 161 000, and 134 300 papers categorized into social sciences or interdisciplinary research; 1 126 200 papers, 1 139 000 papers, and 1 006 300 papers were classified into the field of STM disciplines, with some papers categorized into two or more disciplines. Table 5.1 lists the distribution of China's scientific journals by disciplines in 2015, 2018, and 2021.

Among 60 disciplines, the top six disciplines ranked by the number of papers remained consistent in 2015, 2018, and 2021. The number and percentage of published papers in these six disciplines in 2021 included "Automation Technology and Computer Technology" (82 885 papers, 7.25%), "Transportation Engineering" (72 328 papers, 6.33%), "Civil Engineering" (66 342 papers, 5.81%), "Internal Medicine" (60 037 papers, 5.25%), "Traditional Chinese Medicine & Herbalism" (59 368 papers, 5.20%), and "Nursing" (47 272 papers, 4.14%). Among them, "Automation Technology and Computer Technology" ranked first in terms of the number of published papers within these three years; "Transportation Engineering" had a rapid increase in the number of papers, jumping from 6th place in 2015 to 4th place in 2018, and then to 2nd place in 2021.

5.2 Regional Distribution of China's Scientific Journal Papers

Based on the statistical results of locations of all the publishing institutions in the Chinese mainland (table 5.2), there were five regions occupying over 5% of papers published all over China in 2015, 2018, and 2021, and their ranking based on the number of papers remained the same among these three years. They were ranked in descending order based on the number and percentage of published papers as follows: Beijing (127 699 papers, 10.55%), Jiangsu (102 848 papers, 8.50%), Guangdong (87 215 papers, 7.20%), Henan (70 513 papers, 5.82%), and Shandong (66 286 papers, 5.48%).

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

[2]This chapter is based on the statistics that are subject to the annual inspection of national journals of National Press and Publication Administration and are included in CNKI in the form of full text. Due to the different scopes of the journals, the relevant statistics of 2018 differ from the *Blue Book on China's Scientific Journal Development* (2020).

Tab. 5.1 – Number and percentage of papers published in China's STM journals in various disciplines in 2015, 2018, and 2021.

No.	Disciplines	2015			2018			2021		
		No. of papers	/%	Ranking	No. of papers	/%	Ranking	No. of papers	/%	Ranking
1	Automation Technology and Computer Technology	80 695	6.62	1	82 713	6.63	1	82 885	7.25	1
2	Transportation Engineering	55 290	4.53	6	71 152	5.70	4	72 328	6.33	2
3	Civil Engineering	61 751	5.06	5	80 383	6.44	2	66 342	5.81	3
4	Internal Medicine	76 277	6.25	2	72 134	5.78	3	60 037	5.25	4
5	Traditional Chinese Medicine & Herbalism	66 902	5.49	3	62 065	4.97	6	59 368	5.20	5
6	Nursing	64 770	5.31	4	68 998	5.53	5	47 272	4.14	6
7	Environmental Science and Technology	34 538	2.83	13	40 139	3.22	10	45 924	4.02	7
8	Electrical Engineering	48 060	3.94	9	50 410	4.04	8	45 432	3.98	8
9	Oncology	50 359	4.13	8	49 654	3.98	9	45 044	3.94	9
10	Surgery	54 641	4.48	7	52 213	4.18	7	41 015	3.59	10
11	Chemical Engineering	37 786	3.10	11	36 033	2.89	13	38 114	3.34	11
12	Radio Electronics Telecommunications	39 342	3.23	10	36 261	2.90	12	33 770	2.96	12
13	Obstetrics, Gynecology & Pediatrics	37 348	3.06	12	37 900	3.04	11	30 641	2.68	13
14	Animal Husbandry Veterinary Science	24 913	2.04	17	25 586	2.05	16	28 075	2.46	14
15	Metallurgical Engineering	26 973	2.21	15	25 905	2.08	15	23 531	2.06	15
16	Food Science & Technology	17 643	1.45	24	20 654	1.65	21	22 146	1.94	16
17	Neurology and Psychiatry	24 103	1.98	18	23 824	1.91	17	22 098	1.93	17
18	Mining Engineering Technology	22 862	1.87	20	22 581	1.81	18	21 500	1.88	18
19	Clinical Medicine in General	27 004	2.21	14	30 207	2.42	14	21 489	1.88	19
20	Agronomy	23 497	1.93	19	22 000	1.76	19	20 460	1.79	20
21	Chemistry	25 516	2.09	16	21 910	1.76	20	18 413	1.61	21

Tab. 5.1 – (continued).

No.	Disciplines	2015			2018			2021		
		No. of papers	/%	Ranking	No. of papers	/%	Ranking	No. of papers	/%	Ranking
22	Petroleum and Natural Gas Industry	17 768	1.46	22	20 312	1.63	22	17 583	1.54	22
23	Geology	18 585	1.52	21	19 407	1.55	23	17 353	1.52	23
24	Water Conservancy	16 634	1.36	25	17 187	1.38	25	15 995	1.40	24
25	Horticulture	17 651	1.45	23	17 293	1.39	24	15 991	1.40	25
26	Medical and Health Services	15 494	1.27	27	15 212	1.22	27	15 117	1.32	26
27	Mechanical Engineering	16 175	1.33	26	15 978	1.28	26	14 711	1.29	27
28	Aviation, aerospace Science and Technology	11 505	0.94	35	12 258	0.98	30	13 651	1.19	28
29	Materials Science	8467	0.69	36	10 138	0.81	36	11 980	1.05	29
30	Forestry	11 723	0.96	32	12 532	1.00	28	11 272	0.99	30
31	Pharmacy	12 811	1.05	28	11 509	0.92	31	10 848	0.95	31
32	Plant Protection	11 711	0.96	33	11 469	0.92	32	10 716	0.94	32
33	Preventive Medicine & Hygiene	12 535	1.03	29	12 497	1.00	29	10 713	0.94	33
34	Biology	12 535	1.03	30	10 999	0.88	33	10 285	0.90	34
35	Light Industry (excl Textile & Food)	7175	0.59	39	10 313	0.83	35	9795	0.86	35
36	Otorhinolaryngology and Ophthalmology	11 772	0.97	31	10 852	0.87	34	9318	0.82	36
37	Agricultural Basic Science	7726	0.63	38	7960	0.64	38	8267	0.72	37
38	Mathematics	11 632	0.95	34	9566	0.77	37	8225	0.72	38
39	Basic Medicine	8164	0.67	37	6710	0.54	41	7065	0.62	39
40	Agricultural Engineering	6716	0.55	43	6722	0.54	40	6681	0.58	40
41	Engineering and Technology	5539	0.45	47	5364	0.43	47	6367	0.56	41
42	Atmospheric Science	5938	0.49	46	6374	0.51	43	6040	0.53	42
43	Surveying and Mapping Science & Technology	7084	0.58	41	6912	0.55	39	5866	0.51	43

Tab. 5.1 – (continued).

44	Energy and Power Engineering	6357	0.52	44	5403	0.43	46	5715	0.50	44
45	Stomatology	7041	0.58	42	6574	0.53	42	5495	0.48	45
46	Physics	7096	0.58	40	5353	0.43	48	5422	0.47	46
47	Aquatic Science	5458	0.45	48	5087	0.41	49	4770	0.42	47
48	Metallurgical Engineering Technology	5319	0.44	49	5536	0.44	45	4560	0.40	48
49	Geophysics	4480	0.37	51	4370	0.35	50	4504	0.39	49
50	Marine Sciences	3089	0.25	53	3142	0.25	53	3644	0.32	50
51	Textile Science & Technology	3957	0.32	52	3647	0.29	52	3557	0.31	51
52	Dermatology & Venereology	4588	0.38	50	4173	0.33	51	3364	0.29	52
53	Military Medicine & Special Medicine	6019	0.49	45	6009	0.48	44	2997	0.26	53
54	Weapon Industry & Military Technology	2714	0.22	55	2547	0.20	54	2555	0.22	54
55	Nuclear Science & Technology	1998	0.16	56	1614	0.13	56	1821	0.16	55
56	Mechanics	2830	0.23	54	2074	0.17	55	1587	0.14	56
57	Safety Science and Technology	1233	0.10	57	1031	0.08	57	1034	0.09	57
58	Astronomy	689	0.06	58	718	0.06	58	971	0.08	58
59	Physical Geography	590	0.05	59	498	0.04	59	720	0.06	59
60	Systems Science	417	0.03	60	249	0.02	60	148	0.01	60
	Total	1 219 485	100	–	1 248 311	100.00	–	1 142 587	100.00	–

Note: Ranked in descending order based on the number of papers published in 2021.
There is an overlap in counting the disciplines since a paper may cover two or more areas of specialization.
Ranked by the total number of papers in the discipline in that year.
The data were collected from CNKI.

Tab. 5.2 – Regional distribution of papers published in STM journals from Chinese mainland in 2015, 2018, and 2021.

No.	Region	2015			2018			2021		
		No. of papers	%	Ranking	No. of papers	%	Ranking	No. of papers	%	Ranking
1	Beijing	130 142	9.82	1	127 581	9.46	1	127 699	10.55	1
2	Jiangsu	113 089	8.53	2	113 403	8.41	2	102 848	8.50	2
3	Guang Dong	92 158	6.96	3	91 733	6.80	3	87 215	7.20	3
4	Henan	73 238	5.53	4	80 264	5.95	4	70 513	5.82	4
5	Shandong	67 558	5.10	5	71 236	5.28	5	66 286	5.48	5
6	Shanghai	55 396	4.18	9	58 654	4.35	9	56 024	4.63	6
7	Shannxi	54 415	4.11	10	60 708	4.50	6	53 248	4.40	7
8	Zhejiang	58 085	4.38	7	54 200	4.02	11	50 098	4.14	8
9	Hubei	60 094	4.54	6	60 536	4.49	7	48 794	4.03	9
10	Liaoning	56 872	4.29	8	59 272	4.40	8	48 252	3.99	10
11	Sichuan	53 073	4.01	11	58 347	4.33	10	47 847	3.95	11
12	Anhui	37 642	2.84	14	39 726	2.95	13	36 546	3.02	12
13	Hunan	37 542	2.83	15	37 656	2.79	15	36 303	3.00	13
14	Fujian	31 213	2.36	18	36 504	2.71	16	36 093	2.98	14
15	Hebei	46 720	3.53	12	42 269	3.13	12	34 986	2.89	15
16	Gansu	25 509	1.93	23	26 721	1.98	22	32 075	2.65	16
17	Shanxi	32 271	2.44	16	37 918	2.81	14	31 282	2.58	17
18	Tianjin	30 566	2.31	19	31 774	2.36	18	30 489	2.52	18
19	Heilongjiang	45 163	3.41	13	34 761	2.58	17	26 779	2.21	19
20	Jiangxi	28 065	2.12	21	30 675	2.27	19	26 750	2.21	20
21	Guangxi	28 724	2.17	20	28 663	2.13	20	26 202	2.16	21
22	Yunnan	24 567	1.85	24	25 170	1.87	24	22 317	1.84	22
23	Chongqing	26 217	1.98	22	25 903	1.92	23	20 423	1.69	23
24	Xinjiang	24 062	1.82	25	22 517	1.67	26	19 129	1.58	24
25	Jilin	31 738	2.40	17	27 673	2.05	21	19 092	1.58	25
26	Guizhou	19 559	1.48	27	23 592	1.75	25	18 735	1.55	26
27	Inner Mongolia	21 008	1.59	26	17 117	1.27	27	14 199	1.17	27
28	Ningxia	6944	0.52	28	7136	0.53	30	6465	0.53	28

Tab. 5.2 – (continued).

29	Hainan	6443	0.49	29	7205	0.53	29	6301	0.52	29
30	Qinghai	5644	0.43	30	7654	0.57	28	5589	0.46	30
31	Xizang	1336	0.10	31	1924	0.14	31	1991	0.16	31
	Total	1 325 053	100.00	–	1 348 492	100.00	–	1 210 570	100.00	–

Note: Ranked in descending order based on the number of papers published in 2021.
A paper that is co-authored by authors in different regions will be counted separately.
Ranked by the total number of papers in the region in that year.
The data were collected from CNKI.

5.3 Publishing Institution Distribution of China's Scientific Journals

From the perspective of the number of papers published by various institutions in China's scientific journals in 2015, 2018, and 2021, higher education institutions always ranked first with the largest number of papers, accounting for approximately 33% of the publications, followed by medical institutions, enterprises, scientific research institutions, and other institution types – including public institutions, vocational/technical colleges, primary/secondary schools, and kindergartens.

From the perspective of changes in the number of papers published by various institutions in 2015, 2018, and 2021, it can be concluded that the percentage of papers published by higher education institutions and scientific research institutions was stable; the percentage of papers published by enterprises increased to 15.49% in 2021 (from 12.34% in 2015 and 14.50% in 2018); the percentage of papers published by medical institutions declined (figure 5.1).

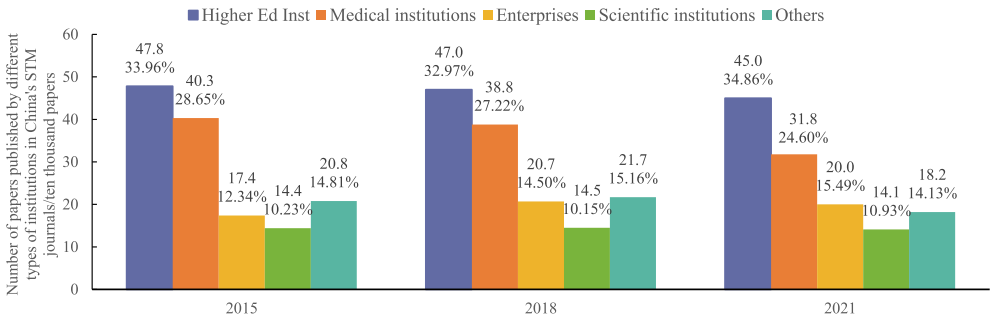

FIG. 5.1 – The distribution of papers published in China's STM journals by different types of institutions in 2015, 2018 and 2021.

Tables 5.3–5.6 show the number of papers published in China's STM journals by each institution type in various disciplines.[3]

1) In 2021, there were nine disciplines in which the percentage of papers published by higher education institutions exceeded 70%, including "Mechanics" (93.69%), "Physics" (91.89%), "Mathematics" (90.94%), "Systems Science" (89.73%), "Materials Science" (86.42%), "Astronomy" (86.29%), "Biology" (82.61%), "Physical Geography" (71.82%), and "Basic Disciplines of Engineering and Technical Sciences" (71.38%). The top three disciplines with the highest number of papers published by higher education institutions in 2015, 2018, and 2021 included "Mechanics", "Physics" and "Mathematics" (table 5.3).

[3]The statistics are performed based on the total number of institutions publishing a single paper. A paper that involves multiple disciplines or is published in collaboration with multiple types of institutions will be counted separately.

TAB. 5.3 – Distribution of papers published by higher education institutions in China's STM journals in various disciplines in 2015, 2018, and 2021 (Top 20 disciplines).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by Higher Ed Inst	%	Ranking	No. of papers	No. of papers by Higher Ed Inst	%	Ranking	No. of papers	No. of papers by Higher Ed Inst	%	Ranking
Mechanics	2818	2537	90.03	2	2057	1883	91.54	1	1584	1484	93.69	1
Physics	6900	6110	88.55	3	5309	4744	89.36	3	5399	4961	91.89	2
Mathematics	11 502	10 441	90.78	1	9530	8655	90.82	2	8197	7454	90.94	3
Systems Science	414	364	87.92	4	249	215	86.35	4	146	131	89.73	4
Materials Science	8331	7154	85.87	5	10 030	8607	85.81	5	11 868	10 256	86.42	5
Astronomy	669	499	74.59	7	708	572	80.79	7	963	831	86.29	6
Biology	12 280	9970	81.19	6	10 826	8837	81.63	6	10 139	8376	82.61	7
Physical Geography	576	419	72.74	8	473	345	72.94	8	699	502	71.82	8
Engineering and Technology	5361	3457	64.48	12	5234	3543	67.69	10	6227	4445	71.38	9
Chemistry	25 117	17 689	70.43	9	21 378	14 720	68.86	9	17 693	11 899	67.25	10
Marine Sciences	3045	1907	62.63	14	3107	2063	66.40	11	3598	2393	66.51	11
Automation Technology and Computer Technology	78 858	51 422	65.21	11	80 957	50 897	62.87	13	80 958	53 217	65.73	12
Food Science & Technology	17 081	11 528	67.49	10	19 772	12 541	63.43	12	20 993	13 746	65.48	13

Tab. 5.3 – (continued).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by Higher Ed Inst	%	Ranking	No. of papers	No. of papers by Higher Ed Inst	%	Ranking	No. of papers	No. of papers by Higher Ed Inst	%	Ranking
Energy & Power Engineering	6138	3463	56.42	19	5261	3240	61.59	14	5598	3550	63.42	14
Basic Medicine	8091	4311	53.28	24	6657	3978	59.76	16	6875	4352	63.30	15
Textile Science & Technology	3708	2139	57.69	16	3460	2059	59.51	17	3382	2062	60.97	16
Aquatic Science	5181	2951	56.96	18	4797	2658	55.41	19	4456	2710	60.82	17
Light Industry (excl Textile and Food)	6296	3542	56.26	20	9745	5675	58.23	18	9422	5609	59.53	18
Weapon Industry and Military Technology	2673	1705	63.79	13	2520	1511	59.96	15	2528	1480	58.54	19
Chemical Engineering	36 395	21 143	58.09	15	34 611	18 510	53.48	22	36 506	21 340	58.40	20

Note: Ranked in descending order based on the number of papers published by higher education institutions in 2021.
The number of papers in this table is provided based on the authors' affiliation institutions in the discipline.
"%" refers to the percentage of the number of papers published by higher education institutions to the total number of papers in this discipline. Ranked by the percentage of papers and published by higher education institutions in the discipline in that year.
The data were collected from CNKI.

2) Medical institutions were the main contributors to papers published in various fields of clinical medicine. In 2021, the top 10 disciplines with a percentage of papers higher than 90% included "Obstetrics and Pediatric" (98.06%), "Surgery" (97.89%), "Dermatology and Venereology" (95.55%), "Nursing" (95.10%), "Oncology" (94.75%), "Otolaryngology and Ophthalmology" (94.44%), "Stomatology" (94.38%), "Internal Medicine" (94.23%), "General Clinical Medicine" (93.37%), and "Neurology and Psychiatry" (91.13%) (table 5.4). In the field of "Pharmacy", the percentage of papers published by medical institutions increased, from 63.26% in 2015 to 67.25% in 2021; on the contrary, in the field of "Basic Medicine", the percentage of papers published by medical institutions decreased more significantly, from 55.35% in 2015 to 46.41% in 2021.

3) The top 10 disciplines with a higher percentage of papers published by enterprises in 2021 included "Petroleum and Natural Gas Industry" (73.69%), "Mining Engineering Technology" (72.79%), "Metallurgical Engineering Technology" (68.89%), "Transportation Engineering"(55.41%), "Electrical Engineering" (53.25%), "Metallurgy and Metalworking" (42.47%), "Civil Engineering" (39.74%), "Energy & Power Engineering" (38.35%), "Chemical Engineering" (36.19%), and "Water Conservancy" (35.28%). Most of these 10 disciplines showed an increasing trend in the percentage of papers published by enterprises in 2015, 2018, and 2021 (table 5.5).

4) The top 10 disciplines with a higher percentage of papers published by research institutions in 2021 included "Nuclear Science and Technology" (60.84%), "Astronomy" (54.00%), "Aquaculture" (42.66%), "Agronomy" (41.77%), "Weapons Industry and Military Technology" (41.10%), "Marine Sciences" (39.55%), "Horticulture" (39.10%), "Aeronautical", "Aerospace Science & Technology" (38.80%), "Geography" (38.10%), and "Plant Protection" (37.27%). Among them, the total number of papers in the field of "Nuclear Science and Technology" and "Weapons Industry and Military Technology" declined, but the number of papers published by research institutions increased slightly, so that their percentage increased by more than 7 percentage points in 2021 compared with 2015 (table 5.6).

5.4 Analysis of Funded Papers Published in China's Scientific Journals

Papers published based on the results of research projects supported by funds are called funded papers. In 2021, a total of 550 300 funded papers were published in China's STM journals. The top three funding sources by number of supported publications were the National Natural Science Foundation of China (NSFC, 167 887 papers), the National Key Research and Development Program of China (66 906 papers), and the Henan Science and Technology Research Plan (6669 papers).

The number of funded papers published in China's STM journals accounted for 48.25% of the total number of papers in 2021, increasing by 9.44% compared with 38.81% in 2018 and by 11.11% compared with 37.14% in 2015. It can be seen that in recent years, the percentage of funded papers in Chinese STM journals increased considerably (table 5.7).

Table 5.8 lists the number of funded papers in various disciplines and their percentage among all papers in China's scientific journals in 2015, 2018, and 2021. The disciplines with

TAB. 5.4 – Distribution of papers published by medical institutions in China's STM journals in various disciplines in 2015, 2018, and 2021 (Top 20 disciplines).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by medical institutions	%	Ranking	No. of papers	No. of papers by medical institutions	%	Ranking	No. of papers	No. of papers by medical institutions	%	Ranking
Obstetrics and Pediatrics	36 975	36 161	97.80	1	37 592	36 823	97.95	1	29 686	29 110	98.06	1
Surgery	54 291	52 964	97.56	2	51 765	50 682	97.91	2	39 685	38 846	97.89	2
Dermatology and Venereology	4540	4299	94.69	5	4130	3926	95.06	7	3262	3117	95.55	3
Nursing	64 312	60 891	94.68	6	68 569	65 416	95.40	4	46 188	43 924	95.10	4
Oncology	50 173	47 638	94.95	4	49 427	47 043	95.18	5	43 581	41 295	94.75	5
Otolaryngology and Ophthalmology	11 677	11 187	95.80	3	10 744	10 300	95.87	3	8874	8381	94.44	6
Stomatology	6960	6457	92.77	9	6433	5971	92.82	10	5358	5057	94.38	7
Internal Medicine	75 426	71 287	94.51	7	71 402	67 709	94.83	8	58 273	54 910	94.23	8
General Clinical Medicine	26 854	25 239	93.99	8	30 033	28 555	95.08	6	20 946	19 558	93.37	9
Neurology and Psychiatry	23 947	22 121	92.37	10	23 659	21 986	92.93	9	21 376	19 481	91.13	10
Military Medicine and Special Medicine	5983	5237	87.53	11	5973	5472	91.61	11	2923	2587	88.50	11
Medical Health	15 232	11 425	75.01	12	14 886	11 356	76.29	12	14 747	11 108	75.32	12
Preventive Medicine and Hygienics	11 985	8835	73.72	13	11 937	8913	74.67	13	10 351	7673	74.13	13
Traditional Chinese Medicine and Herbalism	65 866	45 096	68.47	14	61 256	43 020	70.23	14	58 824	42 548	72.33	14
Pharmacy	12 609	7976	63.26	15	11 319	7182	63.45	15	10 643	7157	67.25	15
Basic Medicine	8091	4478	55.35	16	6657	3198	48.04	16	6875	3191	46.41	16
Husbandry and Veterinary Medicine	22 053	1545	7.01	18	22 219	1577	7.10	17	22 976	1618	7.04	17
Biology	12 280	505	4.11	19	10 826	368	3.40	19	10 139	634	6.25	18
Chemistry	25 117	2099	8.36	17	21 378	1048	4.90	18	17 693	670	3.79	19
Food Science and Technology	17 081	444	2.60	20	19 772	502	2.54	20	20 993	662	3.15	20

Note: Ranked in descending order based on the number of papers published by medical institutions in 2021.
The number of papers in this table is provided based on the authors' affiliation institutions in the discipline.
"%" refers to the percentage of the number of papers published by medical institutions in a discipline to the total number of papers published in this discipline.
Ranked by the percentage of papers and published by medical institutions in the discipline in that year.
The data were collected from CNKI.

TAB. 5.5 – Distribution of papers published by enterprises in China's STM journals in various disciplines in 2015, 2018, and 2021 (Top 20 disciplines).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by enterprises	%	Ranking	No. of papers	No. of papers by enterprises	%	Ranking	No. of papers	No. of papers by enterprises	%	Ranking
Petroleum and Natural Gas Industry	17 388	10 902	62.70	1	19 992	14 174	70.90	1	17 272	12 728	73.69	1
Mining Engineering Technology	22 099	13 029	58.96	3	21 849	14 182	64.91	3	20 292	14 770	72.79	2
Metallurgical Engineering Technology	5203	3127	60.10	2	5321	3496	65.70	2	4420	3045	68.89	3
Transportation Engineering	52 586	23 653	44.98	5	67 739	34 648	51.15	5	67 716	37 520	55.41	4
Electrical Engineering	46 291	22 628	48.88	4	48 992	25 780	52.62	4	44 111	23 491	53.25	5
Metallurgy and Metalworking	26 002	8987	34.56	8	25 106	9532	37.97	7	23 022	9777	42.47	6
Civil Engineering	56 318	21 165	37.58	7	73 247	28 927	39.49	6	61 328	24 369	39.74	7
Energy & Power Engineering	6138	2312	37.67	6	5261	1744	33.15	9	5598	2147	38.35	8
Chemical Engineering	36 395	11 517	31.64	10	34 611	12 551	36.26	8	36 506	13 210	36.19	9
Water Conservancy	15 381	4208	27.36	11	15 768	4644	29.45	10	14 305	5047	35.28	10
Textile Science and Technology	3708	812	21.90	15	3460	829	23.96	13	3382	936	27.68	11
Geology	18 377	4518	24.59	13	19 041	4273	22.44	15	16 964	4673	27.55	12
Safety Science and Technology	830	265	31.93	9	768	198	25.78	12	929	250	26.91	13
Mechanical Engineering	15 475	4191	27.08	12	15 290	4060	26.55	11	14 209	3629	25.54	14
Environmental Science & Technology	32 969	5729	17.38	19	37 581	7900	21.02	16	42 256	10 414	24.65	15
Radio Electronics Telecommunications	38 104	6685	17.54	18	35 257	8020	22.75	14	32 763	7732	23.60	16

Tab. 5.5 – (continued).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by enterprises	%	Ranking	No. of papers	No. of papers by enterprises	%	Ranking	No. of papers	No. of papers by enterprises	%	Ranking
Aviation, Aerospace Science, and Technology	11 160	1727	15.47	20	12 042	2183	18.13	18	13 487	3029	22.46	17
Light Industry (excl Textile & Food)	6296	1513	24.03	14	9745	1784	18.31	17	9422	1989	21.11	18
Food Science and Technology	17 081	2064	12.08	21	19 772	2462	12.45	24	20 993	3749	17.86	19
Surveying and Mapping Science & Technology	6789	707	10.41	24	6582	838	12.73	23	5494	954	17.36	20

Note: Ranked in descending order based on the number of papers published by enterprises in 2021.
The number of papers in this table is provided based on the authors' affiliation institutions in the discipline.
"%" refers to the percentage of the number of papers published by enterprises in a discipline to the total number of papers published in this discipline.
Ranked by the percentage of papers and published by enterprises in the discipline in that year.
The data were collected from CNKI.

TAB. 5.6 – Distribution of papers published by research institutions in China's STM journals in various disciplines in 2015, 2018, and 2021 (Top 20 disciplines).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by research institutions	Percentage/ %	Ranking	No. of papers	No. of papers by research institutions	Percentage/ %	Ranking	No. of papers	No. of papers by research institutions	Percentage/ %	Ranking
Nuclear Science and Technology	1978	1025	51.82	2	1598	983	61.51	1	1803	1097	60.84	1
Astronomy	669	364	54.41	1	708	395	55.79	2	963	520	54.00	2
Aquatic Science	5181	2086	40.26	4	4797	1838	38.32	4	4456	1901	42.66	3
Agronomy	21 949	9076	41.35	3	20 326	8193	40.31	3	18 766	7838	41.77	4
Weapon Industry and Military Technology	2673	908	33.97	12	2520	908	36.03	8	2528	1039	41.10	5
Marine Sciences	3045	1158	38.03	8	3107	1160	37.34	7	3598	1423	39.55	6
Horticulture	16 281	5839	35.86	10	15 528	5556	35.78	10	14 229	5563	39.10	7
Aviation, Aerospace Science and Technology	11 160	4150	37.19	9	12 042	4585	38.08	6	13 487	5233	38.80	8
Geology	18 377	7035	38.28	7	19 041	6857	36.01	9	16 964	6463	38.10	9
Plant Protection	10 901	3744	34.35	11	10 358	3484	33.64	12	9553	3560	37.27	10
Physical Geography	576	225	39.06	5	473	181	38.27	5	699	258	36.91	11
Geophysics	4357	1675	38.44	6	4297	1486	34.58	11	4287	1566	36.53	12
Basic Agricultural Sciences	7378	2466	33.42	13	7572	2441	32.24	13	7851	2787	35.50	13
Surveying and Mapping Science & Technology	6789	2011	29.62	15	6582	1937	29.43	16	5494	1798	32.73	14
Forestry	10 694	3543	33.13	14	11 083	3417	30.83	14	9702	3175	32.73	15
Atmospheric Science	5847	1540	26.34	18	6262	1442	23.03	18	5939	1807	30.43	16
Biology	12 280	3546	28.88	16	10 826	3330	30.76	15	10 139	3025	29.84	17
Water Conservancy	15 381	4236	27.54	17	15 768	4519	28.66	17	14 305	4218	29.49	18

Tab. 5.6 – (continued).

Discipline	2015				2018				2021			
	No. of papers	No. of papers by research institutions	Percentage/ %	Ranking	No. of papers	No. of papers by research institutions	Percentage/ %	Ranking	No. of papers	No. of papers by research institutions	Percentage/ %	Ranking
Environmental Science & Technology	32 969	7849	23.81	19	37 581	8362	22.25	19	42 256	9662	22.87	19
Agricultural Engineering	5780	1304	22.56	20	5871	1237	21.07	20	5589	1241	22.20	20

Note: Ranked in descending order based on the number of papers published by research institutions in 2021.
The number of papers in this table is provided based on the authors' affiliation institution in the discipline.
"%" refers to the percentage of the number of papers published by research institutions in a discipline to the total number of papers published in this discipline.
Ranked by the percentage of papers and published by research institutions in the discipline in that year.
The data were collected from CNKI.

Tab. 5.7 – Number and percentage of funded papers published in China's STM journals in 2015, 2018, and 2021 (Top 20).

Year	No. of papers in this discipline (A)	No. of papers (B)	/% ($B/A \times 100\%$)
2015	1 275 401	473 737	37.14
2018	1 299 966	504 526	38.81
2021	1 140 647	550 318	48.25

Note: Ranked by year of publication.
This table counts all the papers supported by the fund, without limiting the size of the fund.
The data were collected from CNKI.

the highest number of funded papers were categorized into the social welfare and public service fields, and the three disciplines with the highest number of funded papers in 2021 included "Traditional Medicine & Pharmacology" (40 612 papers), "Food Science and Technology" (15 640 papers), and "Agronomy" (13 864 papers).

The top 10 disciplines with the highest percentage of funded papers in 2021 were mainly in basic research fields. Through comparing the three-year data, the top three disciplines with the highest percentage of funded papers included "Biology" (88.33%), "Astronomy" (85.38%), and "Physics" (83.31%). "Traditional Chinese Medicine & Herbalism", "Systems Science", and "Nuclear Science and Technology" had the most significant increase in the percentage of funded papers in 2021 compared with 2015.

5.5 Analysis of Papers with Overseas Authorship and Internationally Co-Authored Papers

"Papers with overseas authorship" refer to papers published in China's scientific journals with the first authors from overseas. "Internationally co-authored papers" refer to publications in China's scientific journals where the first author is affiliated with a Chinese institution, collaborating with co-authors from overseas institutions. Both types of papers are collectively called "overseas papers". In 2021, there were 6469 papers with overseas authorship, while 7749 papers were internationally co-authored papers. The number of papers published by overseas authors in China's STM journals increased first from 6935 papers in 2015 to 7461 papers in 2018 and then decreased by 13.30% in 2021 compared with 2018. In contrast, the number of papers by Chinese authors in collaboration with overseas authors showed a growing trend year by year, from 6454 papers in 2015 to 7145 papers in 2018, increasing by 20.07% in 2021 compared with 2015 (figure 5.2).

There were 20 disciplines with more than 1% of papers published with overseas authorship in China's scientific journals, and the disciplines with the highest number of papers published by overseas authors in 2021 included "Chemical Engineering" (387 papers), "Materials Science" (361 papers), and "Metal Science & Metalwork" (325 papers), which changed slightly from the past few years. More specifically, the disciplines with the highest number of papers published by overseas authors included "Biology", "Chemistry", and "Materials Science" in 2015, "Biology", "Materials Science", and "Mathematics" in 2018. The disciplines with the highest percentage of papers published by overseas authors

TAB. 5.8 – Number and percentage of funded papers published in China's STM journals in various disciplines in 2015, 2018, and 2021 (Top 20 disciplines).

Discipline	2015				2018				2021			
	No. of papers	No. of funded papers	%	Ranking	No. of papers	No. of funded papers	%	Ranking	No. of papers	No. of funded papers	%	Ranking
Nuclear Science and Technology	12 535	10 710	85.44	1	10 999	9467	86.07	1	10 285	9085	88.33	1
Astronomy	689	553	80.26	2	718	606	84.40	2	971	829	85.38	2
Physics	7096	5668	79.88	3	5353	4230	79.02	3	5422	4517	83.31	3
Basic Medicine	11 632	8855	76.13	7	9566	7489	78.29	5	8225	6756	82.14	4
Mechanics	8164	5857	71.74	9	6710	5174	77.11	7	7065	5719	80.95	5
Systems Science	2830	2190	77.39	4	2074	1626	78.40	4	1587	1279	80.59	6
Materials Science	417	276	66.19	13	249	173	69.48	10	148	119	80.41	7
Marine Sciences	8467	6461	76.31	6	10 138	7793	76.87	8	11 980	9585	80.01	8
Physical Geography	3089	2325	75.27	8	3142	2379	75.72	9	3644	2866	78.65	9
Plant Protection	590	455	77.12	5	498	385	77.31	6	720	561	77.92	10
Aquatic Science	5458	3695	67.70	10	5087	3410	67.03	13	4770	3500	73.38	11
Geophysics	4480	3004	67.05	12	4370	2954	67.60	12	4504	3299	73.25	12
Atmospheric Sciences	5938	3766	63.42	16	6374	3694	57.95	17	6040	4301	71.21	13
Chemistry	25 516	17 226	67.51	11	21 910	14 989	68.41	11	18 413	13 030	70.77	14
Food Science and Technology	17 643	11 493	65.14	14	20 654	13 312	64.45	14	22 146	15 640	70.62	15
Basic Agricultural Sciences	7726	4904	63.47	15	7960	5063	63.61	15	8267	5729	69.30	16
Traditional Chinese Medicine & Herbalism	66 902	31 222	46.67	26	62 065	33 895	54.61	20	59 368	40 612	68.41	17

Tab. 5.8 – (continued).

Agronomy	23 497	14 336	61.01	17	22 000	13 230	60.14	16	20 460	13 864	67.76	18
Geology	18 585	10 952	58.93	18	19 407	10 882	56.07	19	17 353	11 046	63.65	19
Nuclear Science and Technology	1998	1035	51.80	22	1614	934	57.87	18	1821	1133	62.22	20

Note: Ranked in descending order based on the percentage of funded papers in 2021.
This table lists all the papers supported by the fund, without limiting the size of the fund.
"%" refers to the percentage of the number of funded papers in a discipline to the total number of papers in this discipline.
"Ranking" refers to the position of a discipline based on the proportion of funded papers within that discipline in a given year.
The data were collected from CNKI.

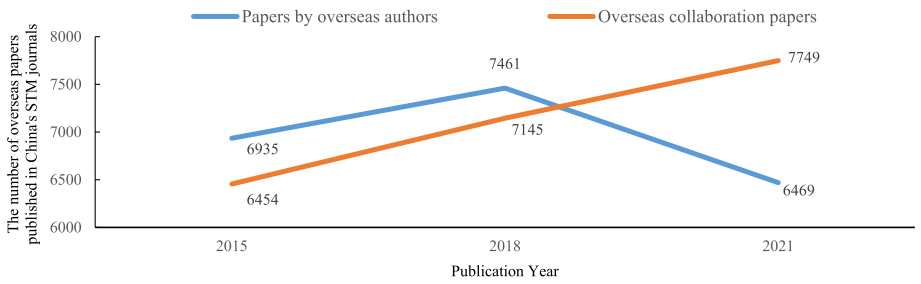

Fig. 5.2 – Number of overseas papers published in China's STM journals in 2015, 2018, and 2021.

included "Astronomy" (9.68%), "Physics" (4.21%), and "Mechanics" (3.21%) in 2021 (table 5.9).

A total of 20 disciplines in which China's STM journals published more than 1% of papers from overseas collaborations in at least one of the surveyed years (2015, 2018, and 2021). The disciplines with the highest number of overseas collaborative papers included "Chemistry" (289 papers) in 2015, "Electrical Engineering" (331 papers) in 2018, and "Electrical Engineering" (578 papers) in 2021. "Astronomy" consistently ranked as the discipline with the highest proportion of internationally co-authored papers across all surveyed years, reaching 10.61% in 2021 (table 5.10).

The publication counts of papers with first authors from China's Hong Kong SAR, Macao SAR, and Taiwan region, as well as collaborative papers between these regions and the Chinese mainland, are presented in table 5.11. Compared with 2015, the number of papers published by authors from Macao SAR and Hong Kong SAR increased by 214.97% and 19.31%, respectively, in 2021; while the number of papers published by authors from the Taiwan region decreased by 59.34% in 2021.

The top 20 countries/regions by total publications in China's scientific journals, along with their respective counts of first-author papers and collaboratively authored papers, are presented in table 5.12. The countries with the highest number of papers published in China's STM journals in 2021 included the United States (3504), the United Kingdom (1160), and Australia (1053). The countries with the highest growth rate in the total number of papers published in China's STM journals in 2021 compared with 2015 included Denmark (78.21%), Malaysia (71.70%), and Pakistan (58.06%).

5.6 Academic Influence of Papers Published in China's SCI Journals

The citation frequency of journal literature reflects, to some extent, the level of academic attention a paper receives, representing its academic influence. This section analyzes the academic influence of China's scientific journal articles based on cumulative citation statistics of papers published between 2012 and 2021 in 4723 CNKI-indexed journals. The statistical sources of citation frequency included journal articles, master's theses, doctoral dissertations, and conference papers from China. The data were collected from CNKI, with the statistical deadline defined as July 3, 2023. It was found that a total of 13.5607 million

Tab. 5.9 – Number of papers published in China's STM journals by overseas authors in 2015, 2018, and 2021.

No.	Discipline	2015				2018				2021			
		No. of papers	No. of papers by overseas authors	%	Ranking	No. of papers	No. of papers by overseas authors	%	Ranking	No. of papers	No. of papers by overseas authors	%	Ranking
1	Astronomy	689	52	7.55	1	718	83	11.56	1	971	94	9.68	1
2	Physics	7096	257	3.62	5	5353	265	4.95	3	5422	228	4.21	2
3	Mechanics	2830	154	5.44	2	2074	114	5.50	2	1587	51	3.21	3
4	Materials Science	8467	332	3.92	3	10 138	425	4.19	5	11 980	361	3.01	4
5	Mathematics	11 632	290	2.49	6	9566	308	3.22	7	8225	191	2.32	5
6	Basic Medicine	8164	182	2.23	7	6710	169	2.52	9	7065	164	2.32	6
7	Physical Geography	590	8	1.36	11	498	13	2.61	8	720	16	2.22	7
8	Biology	12 535	486	3.88	4	10 999	516	4.69	4	10 285	226	2.20	8
9	Geophysics	4480	83	1.85	9	4370	89	2.04	11	4504	84	1.87	9
10	Marine Sciences	3089	61	1.97	8	3142	73	2.32	10	3644	59	1.62	10
11	Atmospheric Science	5938	60	1.01	12	6374	70	1.10	14	6040	87	1.44	11
12	Geology	18 585	159	0.86	15	19 407	206	1.06	15	17 353	246	1.42	12
13	Metal Science & Metalwork	26 973	231	0.86	14	25 905	184	0.71	24	23 531	325	1.38	13
14	Neurology and Psychiatry	24 103	189	0.78	20	23 824	153	0.64	25	22 098	238	1.08	14
15	Energy & Power Engineering	6357	45	0.71	25	5403	49	0.91	18	5715	60	1.05	15
16	Forestry	11 723	100	0.85	16	12 532	117	0.93	16	11 272	118	1.05	16
17	Chemical Engineering	37 786	305	0.81	17	36 033	283	0.79	21	38 114	387	1.02	17
18	Chemistry	25 516	413	1.62	10	21 910	281	1.28	12	18 413	173	0.94	18
19	Nuclear Science & Technology	1998	16	0.80	18	1614	19	1.18	13	1821	16	0.88	19
20	Systems Science	417	3	0.72	24	249	10	4.02	6	148	1	0.68	28

Note: Ranked in descending order based on the percentage of papers published by overseas authors in this discipline in 2021.
%" refers to the percentage of papers by overseas authors against the total number of papers.
"Ranking" refers to the position of a discipline based on the proportion of overseas collaborative papers within that discipline in a given year. The data were collected from CNKI.

TAB. 5.10 – Number of internationally co-authored papers published in China's STM journals in 2015, 2018, and 2021.

No.	Discipline	2015				2018				2021			
		No. of papers	No. of overseas collaborative papers	%	Ranking	No. of papers	No. of overseas collaborative papers	%	Ranking	No. of papers	No. of overseas collaborative papers	%	Ranking
1	Astronomy	689	35	5.08	1	718	56	7.80	1	971	103	10.61	1
2	Physics	7096	198	2.79	4	5353	202	3.77	2	5422	239	4.41	2
3	Materials Science	8467	176	2.08	8	10 138	286	2.82	7	11 980	461	3.85	3
4	Biology	12 535	277	2.21	7	10 999	330	3.00	5	10 285	290	2.82	4
5	Geophysics	4480	110	2.46	6	4370	95	2.17	9	4504	118	2.62	5
6	Marine Sciences	3089	95	3.08	3	3142	101	3.21	4	3644	91	2.50	6
7	Atmospheric Sciences	5938	115	1.94	9	6374	128	2.01	10	6040	146	2.42	7
8	Mathematics	11 632	178	1.53	11	9566	221	2.31	8	8225	185	2.25	8
9	Mechanics	2830	96	3.39	2	2074	60	2.89	6	1587	35	2.21	9
10	Physical Geology	590	8	1.36	12	498	8	1.61	12	720	15	2.08	10
11	Basic Medicine	8164	133	1.63	10	6710	111	1.65	11	7065	139	1.97	11
12	Energy and Power Engineering	6357	47	0.74	20	5403	54	1.00	16	5715	103	1.80	12
13	Geology	18 585	203	1.09	14	19 407	257	1.32	14	17 353	308	1.77	13
14	Chemistry	25 516	289	1.13	13	21 910	267	1.22	15	18 413	293	1.59	14
15	Metallurgy and Metalworking	26 973	188	0.70	23	25 905	212	0.82	18	23 531	374	1.59	15
16	Nuclear Science and Technology	1998	18	0.90	18	1614	24	1.49	13	1821	28	1.54	16
17	Chemical Engineering	37 786	203	0.54	27	36 033	214	0.59	28	38 114	561	1.47	17
18	Systems Science	417	11	2.64	5	249	9	3.61	3	148	2	1.35	18
19	Electrical Engineering	48 060	230	0.48	33	50 410	331	0.66	26	45 432	578	1.27	19
20	Radio Electronics Telecommunications	39 342	288	0.73	21	36 261	260	0.72	21	33 770	357	1.06	20

Note: Ranked in descending order based on the percentage of overseas collaborative papers in this discipline in 2021.
"%" refers to the percentage of overseas collaborative papers to the total number of papers.
"Ranking" refers to the position of a discipline based on the proportion of overseas collaborative papers within that discipline in a given year. The data were collected from CNKI.

TAB. 5.11 – Number of papers published in China's STM journals by authors from Hong Kong SAR, Macao SAR, and Taiwan region in 2015, 2018, and 2021.

No.	Region	2015			2018			2021		
		No. of first-authored papers (A)	No. of co-authored papers (B)	Total no. of papers ($A + B$)	No. of first-authored papers (C)	No. of co-authored papers (D)	Total no. of papers ($C + D$)	No. of first-authored papers (E)	No. of co-authored papers (F)	Total no. of papers ($E + F$)
1	Hong Kong SAR	334	567	901	380	567	947	347	728	1075
2	Macao SAR	101	86	187	141	155	296	309	280	589
3	Taiwan region	227	164	391	147	174	321	55	104	159

Note: The data were collected from CNKI.

TAB. 5.12 – Number of papers published in China's STM journals by overseas authors in 2015, 2018, and 2021 (Top 20 countries).

No.	Country	2015			2018			2021		
		No. of first-author papers (A)	No. of papers with co-authors from China (B)	Total no. of papers ($A + B$)	No. of first-author papers (C)	No. of papers with co-authors from China (D)	Total no. of papers ($C + D$)	No. of first-author papers (E)	No. of papers with co-authors from China (F)	Total no. of papers ($E + F$)
1	USA	1602	2396	3998	1784	2713	4497	1204	2300	3504
2	UK	355	513	868	393	687	1080	383	777	1160
3	Australia	275	468	743	370	577	947	319	734	1053
4	Japan	305	520	825	337	465	802	272	489	761
5	Canada	239	365	604	280	422	702	205	446	651
6	ROK	301	144	445	349	132	481	386	231	617
7	Germany	276	240	516	256	244	500	259	358	617
8	Singapore	123	168	291	134	169	303	130	253	383
9	Iran	425	1	426	407	6	413	307	19	326
10	India	409	16	425	362	21	383	279	29	308
11	France	136	116	252	158	142	300	128	180	308
12	Italy	147	35	182	168	59	227	143	83	226
13	Russia	104	56	160	147	74	221	89	112	201
14	Pakistan	101	23	124	116	62	178	100	96	196
15	Malaysia	87	19	106	91	26	117	102	80	182
16	Switzerland	63	71	134	48	88	136	57	123	180
17	Dutch	62	76	138	69	94	163	63	109	172
18	Denmark	31	47	78	51	71	122	38	101	139
19	Spain	68	22	90	89	29	118	77	45	122
20	Saudi Arab	68	23	91	59	50	109	63	51	114

Note: Ranked in descending order based on the total number of overseas papers in 2021.
The data were collected from CNKI.

citable papers were published in 4723 journals from 2012 to 2021, with the cumulative citations being 66.8449 million and the average cited frequency being 4.93 times per paper.

Among the 13.5607 million papers, 11.6070 million were citable articles in science and technology fields. According to the first-level disciplinary categories in the China Library Classification System, the numbers of papers published and cited in each discipline are listed in table 5.13. Among them, the discipline with the highest publication volume was "Medicine, Health, Comprehensive Medicine & Health" (4 487 000 papers); the highest total citations was observed in "Medicine, Health, Comprehensive Medicine & Health" (24 889 000 citations). The highest citation per paper was in "Environmental Science, Safety Science" (7.33 citations/article).

Tab. 5.13 – Citation analysis of disciplinary publication in China's scientific journals from 2012 to 2021.

No.	Discipline	No. of papers	Total cited frequency	Cited frequency/ Paper
1	R Medicine, Health, Comprehensive Medicine & Health	4 487 196	24 889 281	5.55
2	T Industrial Technology General Intro	4 191 618	20 493 668	4.89
3	S Agriculture, Forestry, Comprehensive Agricultural Science	1 185 357	6 080 442	5.13
4	X Environmental Science, Safety Science	418 868	3 072 128	7.33
5	P Astronomy, Geosciences	397 031	2 861 031	7.21
6	U Transportation	671 097	2 646 288	3.94
7	O Mathematical & Physical Science and Chemistry	411 943	1 790 863	4.35
8	Q Biological Science	116 239	798 257	6.87
9	V Aeronautics, Spaceship	122 329	613 145	5.01
10	N Natural Science General Intro	6392	37 156	5.81

Note: Ranked in descending order based on the total cited frequency.
The total citation frequency refers to the cumulative citation frequency of the paper by journal articles, master's theses, doctoral dissertations, and conference papers from the time of publication to July 31, 2023.
The data were collected from CNKI.

Table 5.14 lists the distribution of cited frequency sources. It can be seen that citations from journal papers accounted for the largest percentage, with its citation frequency reaching 43 404 200 times, accounting for 64.93%, followed by master's theses (20 420 900 times, 30.55%), and doctoral dissertations and conference papers accounted for a relatively small percentage of total citations, accounting for only 3.46% and 1.06% respectively. The above data demonstrates that China's SCI journals play an important supporting role not only in academic communication and scientific research activities but also in the cultivation of professional talents in higher education.

Tab. 5.14 – Citation frequency and proportion of China's scientific journal papers (2012–2021) by document type.

Document type	Citation frequency	Percentage %
Journal Papers	43 404 179	64.93
Master's Theses	20 420 865	30.55
Doctoral Dissertations	2 313 823	3.46
Conference papers	706 000	1.06
Total	66 844 867	100.00

Note: Ranked in descending order based on the citation frequency of various types of documents. The data were collected from CNKI.