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-Focus on “innovation, for a better life of mankind”

On June 3, 2021, the 14th Pujiang Innovation Forum, with the theme of "innovation, for a better life of mankind", was held in Shanghai. This forum was held both online and offline, consisting of Plenary Session, Inno-Match Expo, Young Elite Scientist Summit, Symposium for Young Scientists, and more than ten forums on future science, emerging technology, innovation policy, innovation and entrepreneurship, and young talent. The UAE and Chongqing City participated in the forum as the Country of Honor and the City of Honor respectively. Ali Al Dhaheri, the UAE's ambassador to China, and Xiong Xue, vice mayor of Chongqing, addressed the forum. Seven international representatives, from Portugal, the Netherlands, Belgium, Switzerland, the United Kingdom, the United Nations and Springer Nature respectively, sent congratulatory messages via video link. Sultan Al Jaber, Minister of Industry and Advanced Technology of the UAE, and Bill Gates, co-chair of the Bill & Melinda Gates Foundation, delivered a keynote speech online.

In his keynote speech, Wang Zhigang, Chinese Minister of Science and Technology, said that the world today is undergoing once-in-a-century changes, and science, technology and innovation is vital to delivering a better life for the people. China will

work with the rest of the world more closely in a wide range of areas, and jointly harness science, technology and innovation to build capacity in global public health system; China will pursue innovation-driven, green economic and social development, providing better science and technology solutions for achieving carbon peak and neutrality; China will follow demand-driven, problem-oriented approach, and deliver more high-quality innovation results to improve people's life; China will focus on major issues concerning global sustainable development, build a high-level platform for international science, technology and innovation cooperation, and work with other countries to develop a mutually beneficial global science, technology and innovation governance system.

In an interview with Science and Technology Daily, Ali Al Dhaheri, the UAE's ambassador to China, talked about how S&T cooperation and exchanges have been evolving between the two countries. He pointed out that since the establishment of diplomatic relations between China and the UAE in 1984, the two countries have carried out friendly cooperation in various fields. Cooperation in science and technology is a priority. For example, in the field of agriculture, the renowned Chinese agricultural scientist Mr. Yuan Longping's experiment of planting saltwater-tolerant rice in desert areas of Dubai in the UAE proved to be a success. In the medical field, China's Sinopharm and the UAE's G42 carried out cooperation on COVID-19 vaccine. Sinopharm has carried out phase III clinical trials in the UAE. In March 2021, Sinopharm signed an agreement with the UAE's Julphar to produce Sinopharm vaccine in the UAE. It is estimated that the final production capacity will reach about

200 million doses per year. In the field of scientific research, UAE University and the Chinese Academy of Sciences signed a memorandum of understanding to deepen cooperation in science and innovation.



Pujiang Innovation Forum was jointly launched by the Ministry of Science and Technology (MOST) and Shanghai Municipal People's Government in 2008. With a focus on innovation and by following an international vision and national needs, the forum aims to establish a platform for exchanges on innovative development, dissemination of advanced concepts, communication of academic ideas, interaction among government, industry, universities and institutions, publication of latest policies, and international cooperation in science and technology, to serve the construction of an innovation-oriented country.

With a focus on innovation, the forum keeps pace with the times, brings together global innovation forces, highlights the development of an innovation system, and promotes innovation with a global vision. The forum has been successfully held for 14 years. It has attracted a total of more than 1,500 government officials, professionals

and business leaders for discussion on innovation cooperation, innovation vitality and innovation trends. Centered on the hot topics such as businesses, industries, entrepreneurs, regions, policies, finance, culture and future science, the forum discusses international innovation trends and innovation strategies from different levels and perspectives, making an important social impact.

Facts and figures: innovation in China

--Statistics on China's science papers

In 2019, China published 448,000 domestic science papers, a decrease of 1.6% over the previous year. Papers in clinical medicine accounted for more than a quarter of the total, representing the biggest ratio; the number of papers published by colleges and universities took up 66.3%. In 2019, China published 496,000 SCI papers, ranking the second in the world for the 11th year consecutively, accounting for 21.5% of the world's total. SCI papers in chemistry, computer sciences, engineering technology, geosciences, materials science, mathematics, molecular biology, genetics and physics each accounted for more than 20% of the world's total. The number of China's internationally co-authored papers was 130,000, an increase of 17.4% over the previous year, accounting for 26.2% of China's total. Among the co-authored papers, there were 73.9%, or 96,000 with the Chinese as the first authors.

❖ Domestic papers

In 2019, China published 448,000 domestic science papers, down 1.6% from the previous year.

1. Clinical medicine papers led in number and ratio

In terms of the number of science papers in China, the top discipline is clinical medicine, followed by computing technology, electronics, communication and automation, traditional Chinese medicine, agronomy, preventive medicine and hygiene, geoscience, environmental science, civil engineering, and chemical engineering. The total number of papers in these 10 disciplines is 28,000, accounting for 62.9% of all domestic science papers. The papers in clinical medicine, No.1 in number, stood at 118,000, accounting for 26.4% of the total domestic science papers.

2. Domestic papers mainly came from universities

In 2019, domestic science papers mainly came from universities, reaching 297,000, or 66.3% of the national total. Compared with the previous year, the number of papers published by universities, medical institutions and research institutes decreased, while the number of corporate papers increased significantly to 28,000, or 6.2% of the national total, representing an increase of 11.3% over the previous year.

Distribution of domestic papers by institution (year 2019)

Institution type	Number of papers (10,000)	Ratio (%)	Increase over the previous year (%)
Universities	29.7	66.3	-1.4

Medical institutions	5.5	12.3	-7.0
Research institutions	5.2	11.6	-1.1
Companies	2.8	6.2	11.3
Others	1.5	3.6	-4.0

Note: Papers by medical institutions do not include those by university-affiliated hospitals.

❖ II. SCI papers

In 2019, SCI database included 2.305 million papers worldwide, an increase of 11.4% over the previous year.

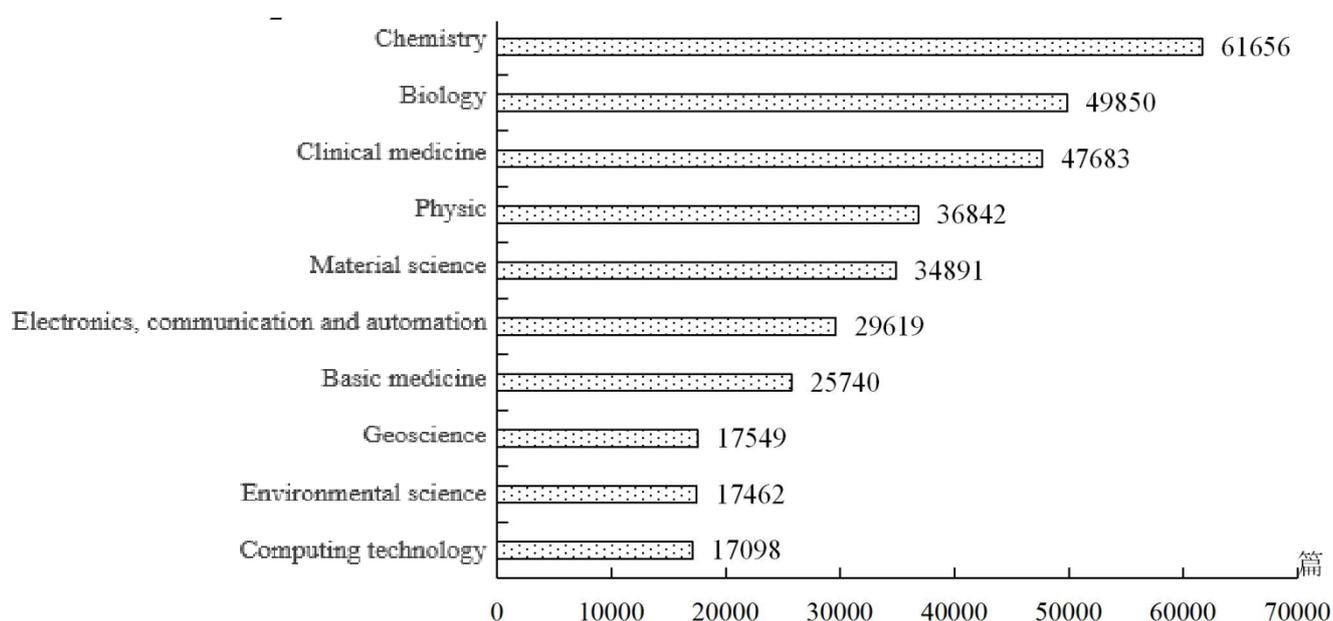
1. The number of China's SCI papers and its proportion in the world's total continued to grow.

In 2019, China published 496,000 SCI papers, or 21.5% of the world's total, an increase of 1.3 percentage points over the previous year. China had ranked second in the world for the 11th year in a row. The United States ranked first, with 590,000 papers, accounting for 25.6% of the world's total.

2. The field of chemistry produced the biggest number of SCI papers among all disciplines, and most disciplines showed remarkable growth in the number of SCI papers over the previous year.

In 2019, the top 10 disciplines in terms of the number of SCI papers are chemistry, biology, clinical medicine, physics, material science, electronics, communication and automation, basic medicine, geoscience, environmental science and computing technology. The 10 disciplines accounted for 68.2% of the total of China's SCI papers. The field of chemistry, No.1 in the ranking, produced 62,000 SCI papers, or 12.4% of China's total.

Top 10 disciplines in terms of the number of SCI papers (year 2019)



3. The total number of papers in 8 disciplines including material science accounted for more than 20% of the world's total

From 2010 to 2020 (as of September 2020), chemistry took up the highest proportion in China's SCI papers, exceeding 516,000. This was significantly higher than that of other disciplines. A cumulative number of more than 200,000 papers were published by four other disciplines, namely engineering technology (416,000), material science (349,000), clinical medicine (327,000) and physics (268,000). The proportion of

papers in eight disciplines exceeded 20% of the world's total. They were: material science (35.41%), chemistry (28.25%), engineering technology (27.89%), computer science (26.45%), physics (24.09%), geoscience (22.10%), mathematics (21.57%), and molecular biology and genetics (21.19%).

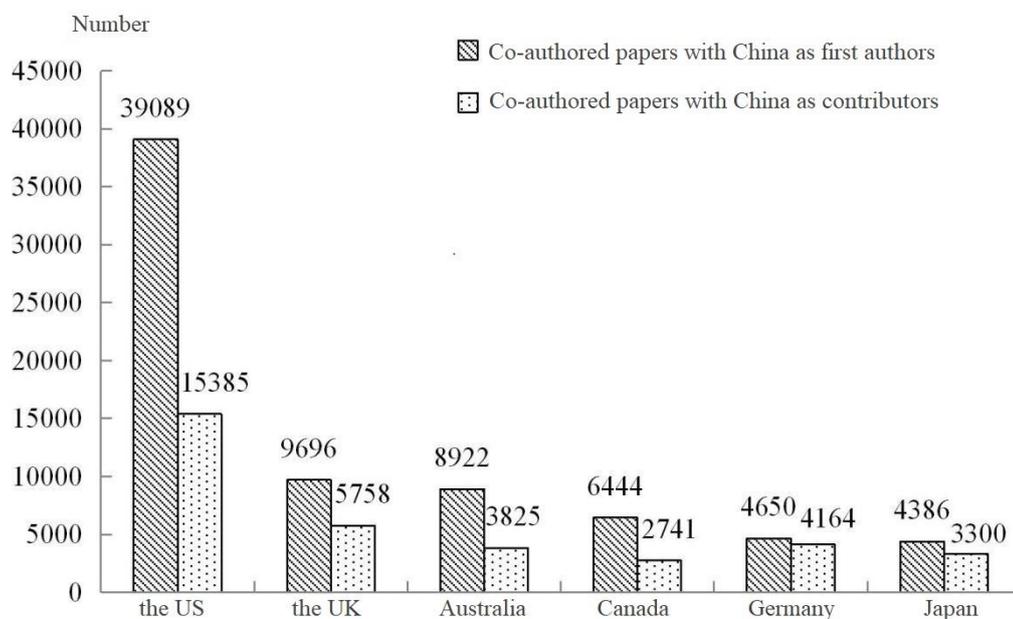
4. The total paper citations and the citations per paper showed significant growth

From 2010 to 2020 (as of September 2020), Chinese researchers published a total of 3.019 million SCI papers, remaining the second in the world. That was an increase of 15.8% compared with that as of 2019. There were 36.0571 million citations, ranking the second in the world. That was up 26.7% higher than that as of 2019. The citations per paper on average in China was 11.94, which was 9.3% higher than that in the previous year (10.92 per paper). The total number of citations in the world was 1,326. There was still a gap between China's average number of citations and the world average. Among the science papers published in China from 2010 to 2020, the number of citations in chemistry, engineering technology and material science ranked the first in the world. In 2010-2020, there were 22 countries/regions that published more than 200,000 science papers each. China stood at 16th in terms of the citations per paper, the same spot as the previous year.

❖ III. Internationally co-authored papers

1. The number of internationally co-authored papers continued to grow, and those first-authored by China increased significantly.

Among the China's SCI papers in 2019, 130,000 or 26.2% were internationally co-authored ones, an increase of 17.4% over 2018. In 2019, 73.9% of China's internationally co-authored papers, or 96,000, were first-authored by China. The partners involved 167 countries (regions). The top six ones were the United States, the United Kingdom, Australia, Canada, Germany and Japan. A total of 34000 cooperative papers were published by Chinese authors and other countries as the first authors, involving 190 countries (regions). The top six partners were the United States, the United Kingdom, Germany, Australia, Japan and Canada.



Top partners with which China co-authored papers (year 2019)

2. Internationally co-authored papers were concentrated in a few disciplines, with biology leading in number.

China's internationally co-authored papers were concentrated in chemistry, biology, physics, clinical medicine, material science, and electronics, communication and automation. In 2019, chemistry took up the biggest proportion of China's

internationally co-authored papers with Chinese as first authors, standing at 11,498. That was 17.2% of the total papers in chemistry. Biology accounted for the lion's share in the internationally co-authored papers with Chinese authors as contributors, standing at 4,389. That represented 7.9% of the total papers in biology.

Top 6 disciplines in terms of the number of internationally co-authored papers (year 2019)

China as first authors			China as contributors		
Disciplines	Number of papers	Proportion in the total number of the discipline	Discipline	Number of papers	Proportion in the total number of the discipline
Chemistry	11498	17.2	Biology	4389	7.9
Biology	10071	18.2	Chemistry	4340	6.5
Electronics, communication and automation	7820	24.5	Clinical medicine	4115	7.5
Clinical medicine	7198	13.1	Physics	3292	8.1
Physics	7005	17.2	Material Science	2010	5.4
Material science	6646	17.8	Basic medicine	1875	6.6

(Source: Ministry of Science and Technology of China)