

Navigating China's Academic & Research Landscape

A GUIDE FOR ACADEMIC PUBLISHERS AND SOCIETIES



01.

EXECUTIVE SUMMARY

In the Fourteenth Five-Year-Plan (14FYP) of China, innovation and technological self-reliance are the key drivers of its modernization. Accordingly, the country has made R&D investments in the fields of artificial intelligence, quantum information, integrated circuits, life and health sciences, neural science, biological breeding, and aerospace technology. Additionally, funding in basic research will be raised from 6% in 2019 to an annual rate of at least 7% over the course of the 14FYP.

While the US is currently the top nation in R&D, China is fast closing in and currently harbors 1.87 million researchers (~440K more than the US). NSF Data from 2018 reveals that China has surpassed the US in science and engineering journal articles and conference papers. The US, however, still retains the top position in the top 1% cited articles, with the US at 29% and China at 21%. Additionally, while China has the largest number of publications in engineering, it lags behind the US, EU, Japan, and India in research related to health sciences.

From 2000 to 2019, Beijing has spent roughly 80% of its R&D budget on experimental development research, far surpassing other developed countries such as the US or Japan, which allot only just over 62%. However, China lags in funding for basic research, averaging only 5% of R&D budget between 2000 and 2018. Additionally, expenditure on applied research has dropped to 11% from 17%. In light of these facts, Li Keqiang, current premier of China, promises to boost spending on basic research in the 14FYP.

Overall, government policies have a major influence on Chinese scholars and with its latest policies of restoring “the scientific spirit, innovation quality, and service contribution” of research and promoting the return of universities to their academic aims, it will likely encourage the growth and development of Chinese journals.



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1.87 MILLION

Researchers
(~440K more than in the US)

80%

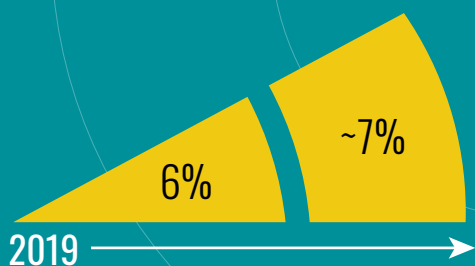
R&D budget spent on experimental development research by Beijing
(~18% more than US and Japan)

Figure 1: China's R&D trends

THE FIVE YEAR PLAN (FYP) AT A GLANCE

The **FYP** represents important guidelines for China's economic and social development

Fundamental research funding



INCREASE IN THE ANNUAL RATE OF FUNDING DURING THE FYP

Total expenditure vs. investment in basic research (2019)

TOTAL EXPENDITURE
2.21 TRILLION
CHINESE YUAN
(US\$322 BILLION)

INVESTMENT IN
BASIC RESEARCH

133.56 BILLION
CHINESE YUAN
(US\$20 BILLION)

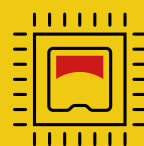
7 fields highlighted for R&D investments



ARTIFICIAL INTELLIGENCE



QUANTUM INFORMATION



INTEGRATED CIRCUITS



LIFE AND HEALTH SCIENCES



NEURAL SCIENCE

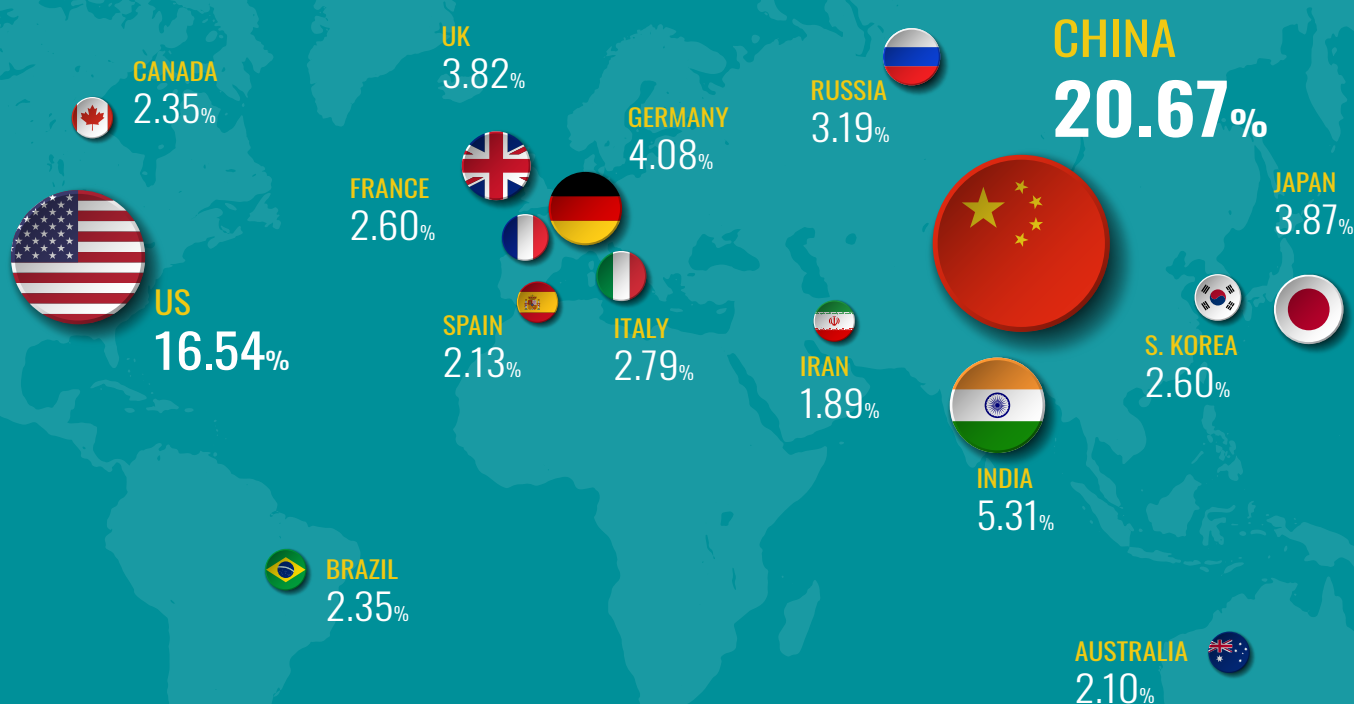


BIOLOGICAL BREEDING



AEROSPACE TECHNOLOGY

Figure 4: Percentage global split of production of S&E articles in all fields in 2018



In China, the largest number of publications based on field of science research are for engineering (25%), followed closely by health-related research (23%), then by computer and information sciences (13%) (Figure 5). Although China is behind the US, EU, Japan, and India for health-related research, it leads in Engineering.

Figure 5: The 2018 S&E research portfolio separated by the seven largest fields of science in the selected region, country, or economy

	US	EU	China	Japan	India
Health science and biological & biomedical sciences	47.95%	39.10%	22.96%	42.56%	24.41%
Engineering	12.84%	14.43%	25.47%	15.13%	17.56%
Computer and information sciences	7.66%	9.60%	13.24%	9.36%	18.41%
Physics	6.46%	8.39%	10.07%	12.87%	10.59%
Chemistry	3.56%	5.33%	9.61%	7.36%	8.46%
Materials sciences	1.30%	2.56%	6.48%	3.18%	9.32%
Social sciences	7.34%	6.86%	1.04%	1.45%	1.48%

(National Science Board | Science & Engineering Indicators | NSB-2020-6)

From 2000 to 2019, Beijing has spent roughly 80% of its funding on experimental development (China Power Team 2021). This spending allows quick adaptation by local manufacturers to the domestic market. Comparatively, other innovative countries like the US and Japan only devote just over 62% of R&D expenditure on experimental development research.

Basic and applied research is critical for increasing development of new scientific ideas and cutting-edge technologies. Unfortunately, China is lagging in this aspect, only averaging 5% of total R&D expenditure in basic research between 2000 and 2018. At the same time, R&D expenditure on applied research expenditure dropped from 17% to 11%. Therefore, Premier Li Keqiang's promise to boost spending on basic research in 14FYP generated considerable excitement, with its aim of driving China's scientific and technological innovation.

80%

R&D budget spent on experimental development research by Beijing
(~18% more than US and Japan)



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