

# CHINA

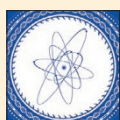
## by the numbers

BY RICHARD VAN NOORDEN

*Research capacity has grown rapidly, and now quality is on the rise.*

China's blazing economic growth has cooled in recent years, but the nation's scientific ambitions show no signs of fading. In 2000, China spent about as much on research and development (R&D) as France; now it invests more in this area than the European Union does, when adjusted for the purchasing power of its currency. That surge in funding has paid off. China now produces more research articles than any other nation, apart from the United States, and its authors feature on around one-fifth of the world's most-cited papers. Top Chinese scientific institutions are breaking into lists of the world's best, and the nation has created some unparalleled facilities.

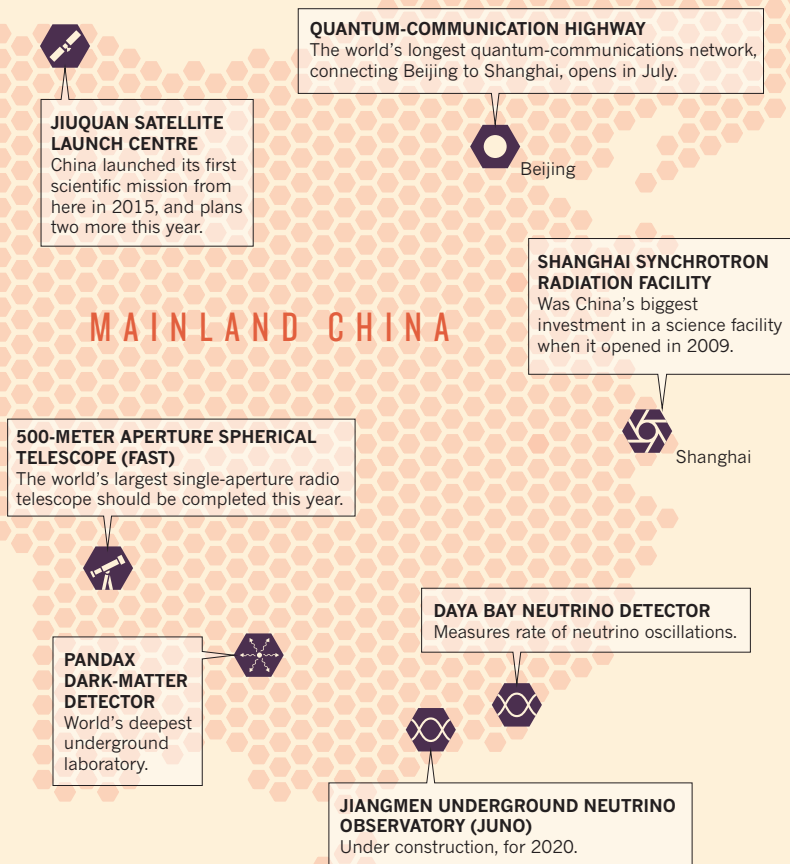
There's room for improvement within that bright picture. China steers much less of its R&D funding towards basic research than do many science powerhouses, and its international collaboration rates are on the low side. The scholarly impact of its papers is improving rapidly, yet it remains below the world's average. And although China boasts more than 1.5 million researchers, that's a small number given its vast population. The country's leaders recognize some of the weaknesses and have pledged to increase funding for science and technology, aiming particularly to stimulate innovation. ■



**SCIENCE IN CHINA**  
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## BIG SCIENCE

The scale of some of China's experimental facilities — from one of the world's largest telescopes to the deepest underground laboratory — showcases the country's soaring research ambitions.



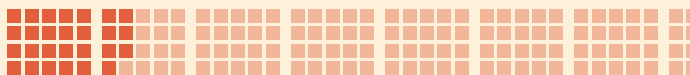
## TOP INSTITUTIONS

The Chinese Academy of Sciences and the nation's leading universities produce tens of thousands of papers every year. A sizeable portion of those rank among the world's best.

■ 250 papers published in 2015 ■ Papers in the world's top 10%

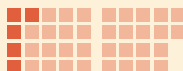
### CHINESE ACADEMY OF SCIENCES

Network of institutes headquartered in Beijing  
36,996 papers / 19% in the top 10%



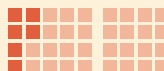
### ZHEJIANG UNIVERSITY

Hangzhou  
9,429 / 14%



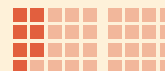
### TSINGHUA UNIVERSITY

Beijing  
9,017 / 18%



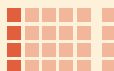
### PEKING UNIVERSITY

Beijing  
9,030 / 20%



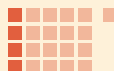
### FUDAN UNIVERSITY

Shanghai  
6,072 / 18%



### NANJING UNIVERSITY

Nanjing  
5,207 / 19%



### UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA

Hefei  
4,512 / 22%



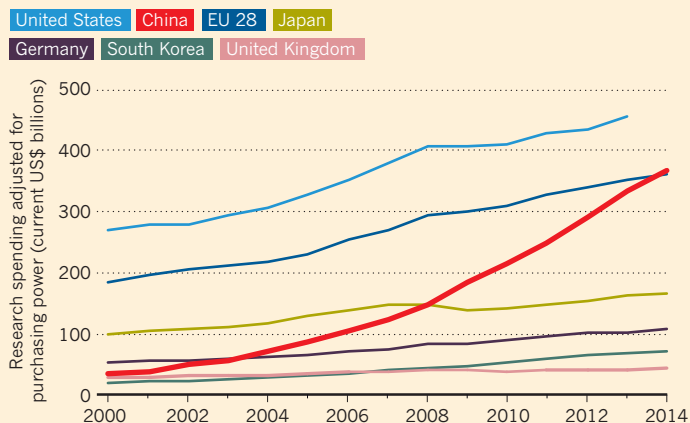
Rounded to nearest 250 papers.

SOURCE: SCIVAL/SCOPUS

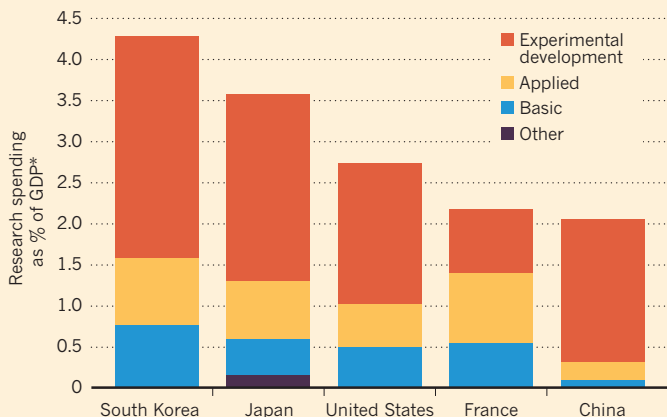
SOURCE: OECD

## SPENDING

China's science spending is soaring as the country's economy grows and it devotes a greater share to R&D. In absolute terms, China's R&D spending is still only about two-thirds of Europe's. But when its lower wages are taken into account, this translates into a purchasing power that surpasses that of the EU and is on track to overtake the United States by the end of this decade.



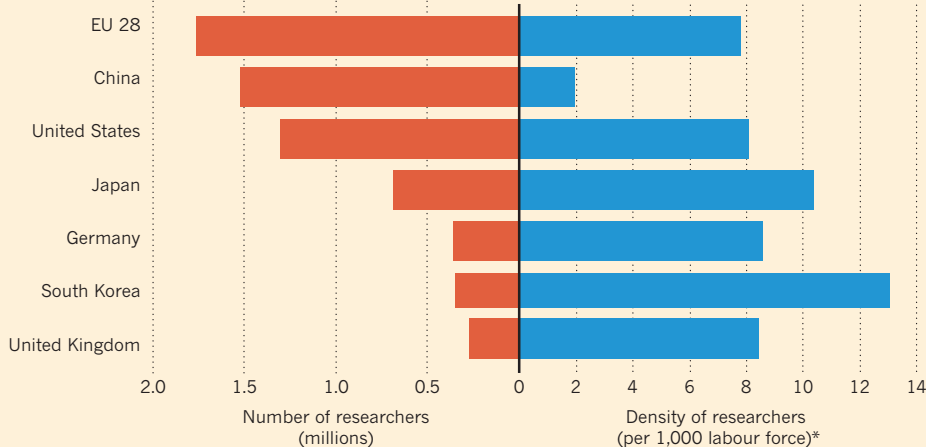
The country now invests more than 2% of its gross domestic product (GDP) on R&D — a greater proportion than the European Union — and wants to reach 2.5% by the end of this decade. However, only 5% of China's R&D spending goes to basic research — a much lower proportion than that of other leading nations. Most of China's R&D funding is aimed at commercially-related technology development.



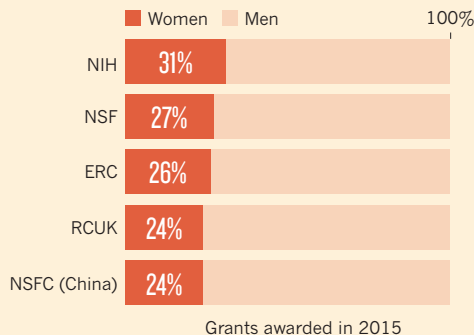
SOURCE: OECD

## SCIENCE WORKFORCE

China now has more scientists than the United States. But with a population of more than 1.3 billion, it trails behind other major science nations in terms of the density of its scientific workforce.



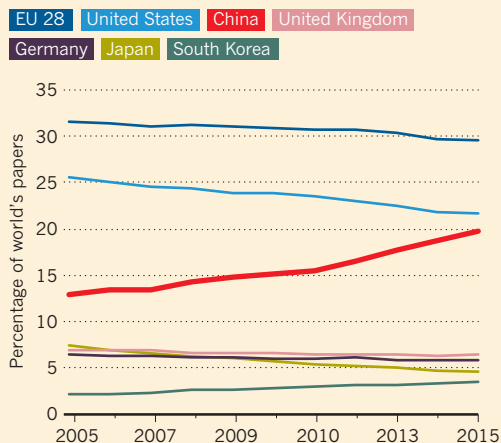
Figures from China's major basic-science funding agency, the National Natural Science Foundation (NSFC), suggest that women now receive around one-quarter of the grants — a figure comparable with that reported by research agencies in the United States and Europe.



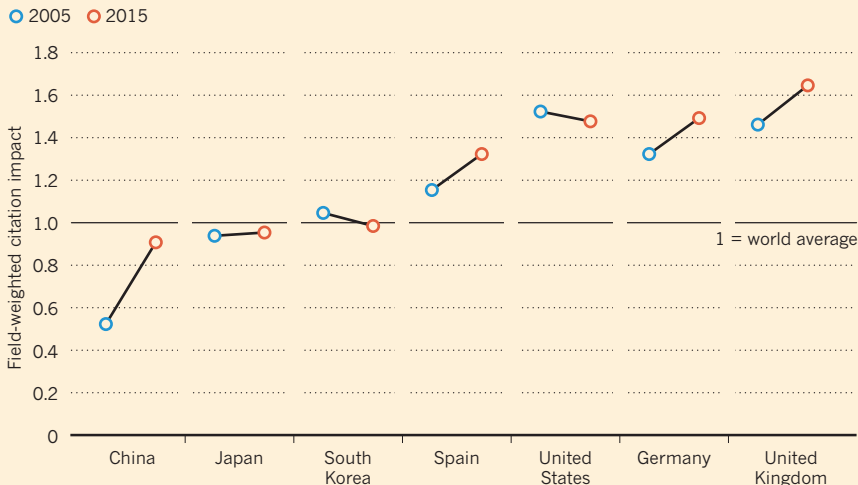
SOURCE: SCIVAL/SCOPUS

## OUTPUT

In the past decade, China's share of the world's research articles has surged from 13% to 20% — and its share of the world's top-cited articles has shown similar growth.



The scholarly impact of the country's output overall remains below the world's average — but it is rapidly improving. The country has its highest impact in the chemical sciences.



NIH, US National Institutes of Health; NSF, US National Science Foundation; ERC, European Research Council; RCUK, Research Councils UK. \*All spending and workforce figures are for 2014, except those for the United States, which are for 2013. US density of researchers is for 2012.