

# BUILDING A POWERHOUSE

The story of China's phenomenal growth in scientific output during the past three years can be told through the experience of eleven cities. Each has displayed impressive output, measurable in one way or another, as determined by analysis of Nature Index data from 2012 to 2014.

Four index metrics have been used to evaluate the performances of China's cities: article count (AC); fractional count (FC); collaboration score and weighted fractional count (WFC). (For a full explanation of these metrics see S190.)

Represented here in yellow are China's scientific heavyweights Beijing, Shanghai and Nanjing: the cities that have shown the highest total output. The index data also reveal some of the cities where total scientific output has been growing fastest — China's rising stars — are Xi'an, Chengdu and Hangzhou, shown in orange. Delving deeper into index data identifies Shenzhen, Beijing and Wuhan,

represented in red, as the nation's industrial research powerhouses; where high scientific output is being used to generate economic return. Meanwhile, the cities most actively pursuing partnerships to advance scientific discoveries are Hefei, Tianjin and Hong Kong, in purple. ■

Data analysis by Larissa Kogleck

**ARTICLE COUNT**  
These 11 cities generated **72%** of China's overall articles in the Nature Index in 2014.

BEIJING AC: 5,163

SHANGHAI AC: 1,955

NANJING AC: 1,064

HEFEI AC: 696

WUHAN AC: 619

HONG KONG AC: 600

TIANJIN AC: 461

HANGZHOU AC: 458

XI'AN AC: 309

CHENGDU AC: 287

SHENZHEN AC: 165

**1.4B**  
TOTAL ESTIMATED POPULATION OF CHINA, THE WORLD'S MOST POPULOUS COUNTRY.

**RISING STARS**  
Xi'an, Chengdu and Hangzhou experienced significant growth in their contribution to the Nature Index.

**XI'AN**  
>2014 WFC: 141  
>2013 WFC: 95  
>2012 WFC: 58

**CHENGDU**  
>2014 WFC: 131  
>2013 WFC: 107  
>2012 WFC: 73

**2.1%**  
PERCENTAGE OF GDP SPENT ON R&D IN 2014.

**8,641**  
CHINA'S ARTICLE COUNT 2014

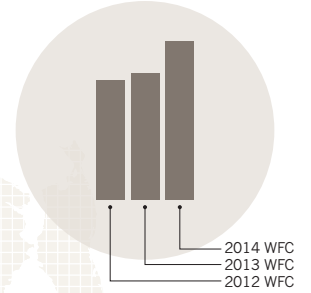
**6,037**  
WEIGHTED FRACTIONAL COUNT 2014

**6,328**  
FRACTIONAL COUNT 2014

**4,541**  
CHINA'S COLLABORATION SCORE 2014

**LEGEND**

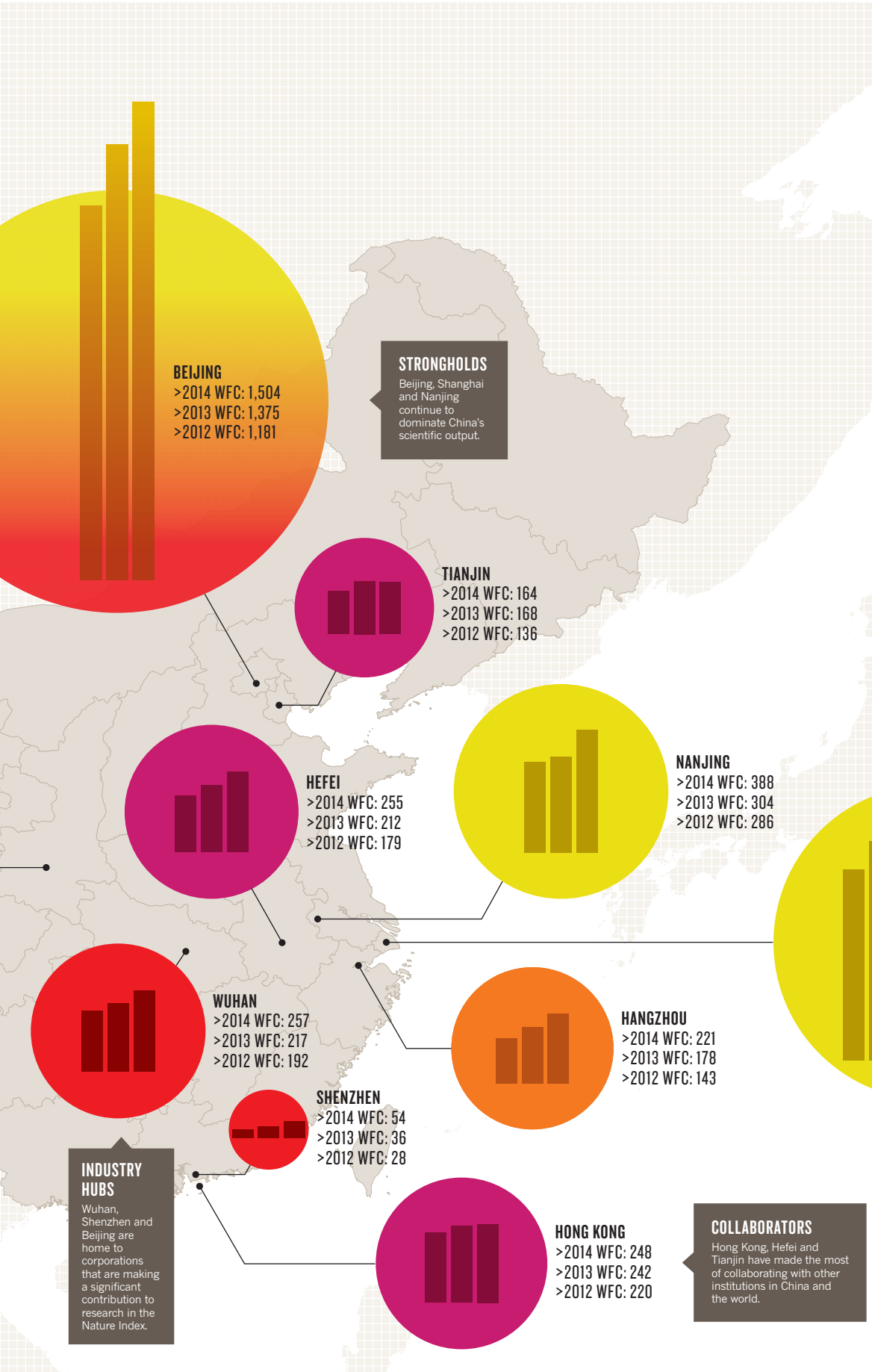
Circle size is relative to WFC in 2014.



**EXPLORE CHINA**

Read more about the cities behind China's rapid scientific ascension.

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- **RISING STARS** ▶ PAGE S179
- **INDUSTRY HUBS** ▶ PAGE S184
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**BEIJING**

>2014 WFC: 1,504  
>2013 WFC: 1,375  
>2012 WFC: 1,181

**STRONGHOLDS**

Beijing, Shanghai and Nanjing continue to dominate China's scientific output.

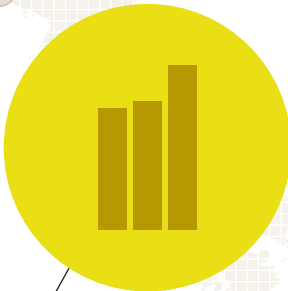
**TIANJIN**

>2014 WFC: 164  
>2013 WFC: 168  
>2012 WFC: 136



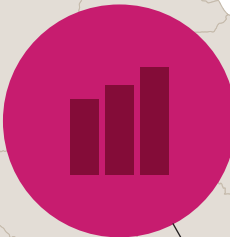
**NANJING**

>2014 WFC: 388  
>2013 WFC: 304  
>2012 WFC: 286



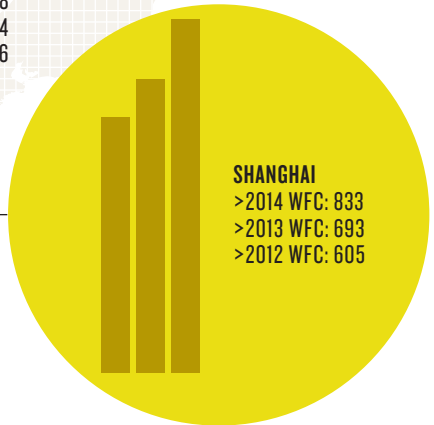
**HEFEI**

>2014 WFC: 255  
>2013 WFC: 212  
>2012 WFC: 179



**SHANGHAI**

>2014 WFC: 833  
>2013 WFC: 693  
>2012 WFC: 605



**WUHAN**

>2014 WFC: 257  
>2013 WFC: 217  
>2012 WFC: 192



**HANGZHOU**

>2014 WFC: 221  
>2013 WFC: 178  
>2012 WFC: 143



**SHENZHEN**

>2014 WFC: 54  
>2013 WFC: 36  
>2012 WFC: 28



**INDUSTRY HUBS**

Wuhan, Shenzhen and Beijing are home to corporations that are making a significant contribution to research in the Nature Index.

**HONG KONG**

>2014 WFC: 248  
>2013 WFC: 242  
>2012 WFC: 220



**COLLABORATORS**

Hong Kong, Hefei and Tianjin have made the most of collaborating with other institutions in China and the world.