

## SIDEBAR

### China's Progress in Supercomputers

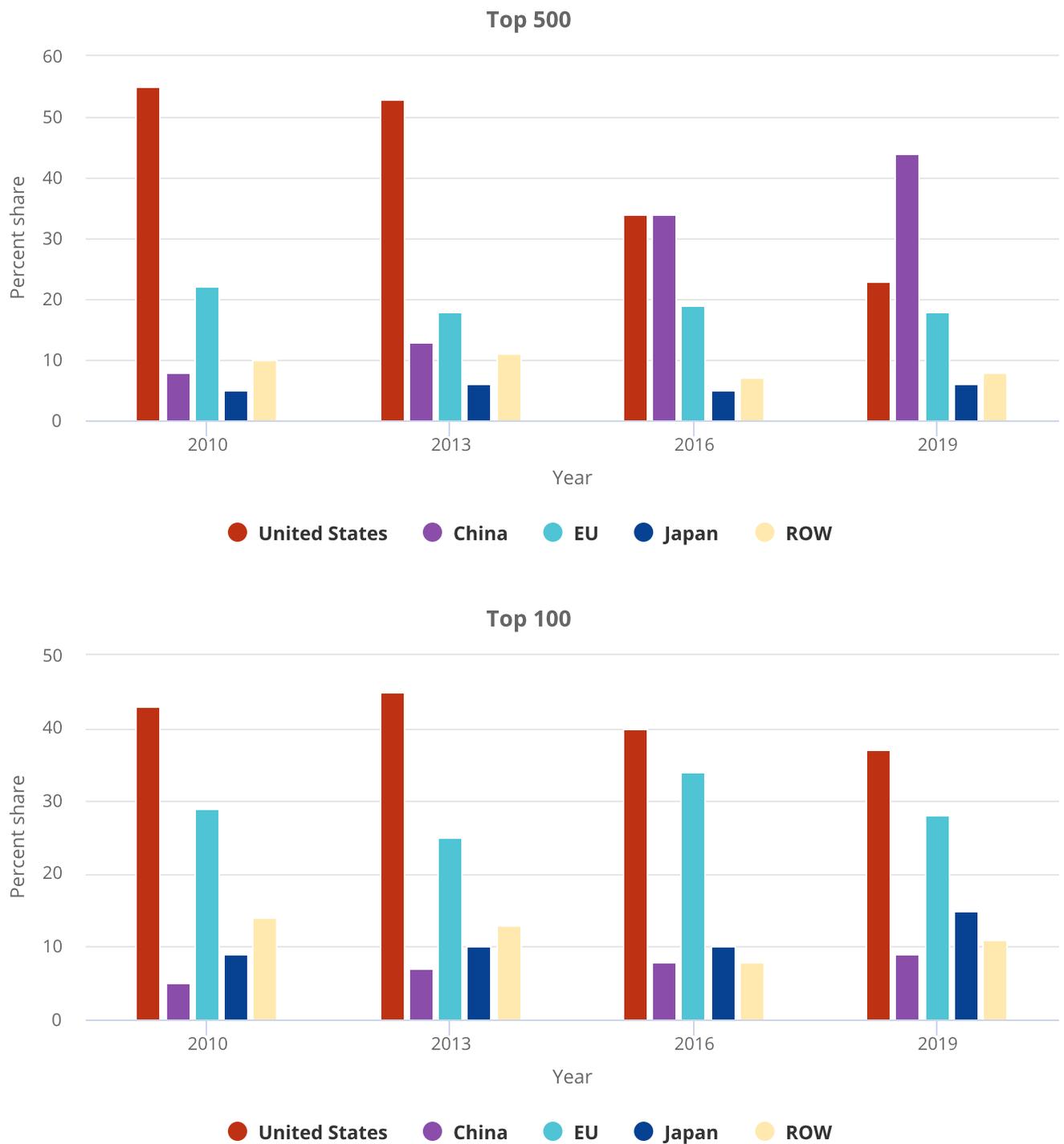
The TOP500, an organization composed of computer scientists and industry specialists, has been tracking the world's most powerful and fastest-performing supercomputers since 1993. The TOP500 provides a semiannual update of the world's top 500 supercomputers, including information on the country of origin, performance, type of application, and technology. According to the TOP500's June 2019 data, two supercomputers in China were ranked third and fourth in the world, giving China two slots in the top 10 list. The world's third-ranked computer is the 93-petaflop Sunway TaihuLight supercomputer at the National Supercomputing Center in Wuxi.\* The fourth-ranked computer is the 61-petaflop Tianhe-2A (MilkyWay-2A) in the National Supercomputer Center in Guangzhou. The United States continued to have the largest share of supercomputers in the TOP10, with five in the 2019 list. China has become dominant in the TOP500 list in a remarkably short time with its share jumping from 13% in 2013 to 44% in 2019 (Figure 6-D). The U.S. share has fallen sharply from 53% to 23% in the same period (Figure 6-D). Although its achievements are impressive, China's dominance is concentrated in the bottom half of the TOP500 list that largely consists of less advanced supercomputers that conduct routine activities such as running Web-based or back-office applications (Feldman 2017). China's median ranking in the TOP500 (the middle of China's ranked supercomputers) was 306. Although it has a much smaller share of the TOP500 list than China, the median ranking of the United States is 157.

The United States remains dominant in the TOP100 list that typically are the most sophisticated supercomputers used in scientific research (Figure 6-D). These supercomputers conduct scientific activities, such as processing and simulating quantum mechanics, weather forecasting, climate research, oil and gas exploration, and molecular modeling and physical simulations. China's share (9%) is far smaller than the United States, and it has made far less progress increasing its presence in the TOP100 list compared to the TOP500 (Figure 6-D).

\* One petaflop is equivalent to one thousand million million ( $10^{15}$ ) floating-point operations per second.

FIGURE 6-D

## Top-ranked supercomputers, by region, country, or economy: 2010–19



EU = European Union; ROW = rest of world.

**Source(s):**

TOP500, May 2019 and November 2016, 2013, and 2010 reports.

Science and Engineering Indicators