



Norman P. Neureiter is director of the Center for Science, Technology, and Security Policy at the American Association for the Advancement of Science (AAAS), Washington, DC.



Tom C. Wang is director for international cooperation at the AAAS, Washington, DC.

U.S.-China S&T at 30

IN 1972, THE SHANGHAI COMMUNIQUE OF PRESIDENT NIXON AND CHINESE PREMIER ZHOU ENLAI ended 23 years of isolation between the United States and China. Tucked into a single sentence was a brief reference to cooperation in science and technology (S&T). Visits by scientists and scholars then gradually increased, guided on the U.S. side by the nongovernmental National Academy of Sciences. Six years later, and presaging formal diplomatic relations in 1979, came the breakthrough science diplomacy mission of the President's Science Advisor Frank Press, accompanied by representatives of nearly every technical federal agency. That trip laid the groundwork for the formal Agreement on Cooperation in S&T, signed exactly 30 years ago this week by President Carter and the Chinese leader Deng Xiaoping.

The new U.S. president firmly believes in the power of science to address domestic and global challenges, making this 30th anniversary year an excellent time to assess the U.S.-China S&T relationship and ensure that it is on the right track for the future. These ties have come a long way. Over a million Chinese students have studied at U.S. universities, some two-thirds of them in S&T. Many have stayed, and today about 8% of science and engineering Ph.D.s in the United States were born in China.* In recent years, almost 40% of Chinese science and engineering articles in international journals have had U.S. coauthors, and almost 8% of U.S. international papers have had Chinese coauthors. In 2004, \$622 million of China's total R&D was performed by U.S.-owned companies and affiliates in China. With the exception of one area—space exploration—research cooperation between universities as well as government labs is broad and diverse. Furthermore, China has declared that its path to the future will be driven largely by S&T, and it is making the needed commitments to education, facilities, and research.†

However, the overall relationship with China is not without tensions. The massive U.S. trade deficit is equated with the loss of U.S. jobs, the alleged manipulation of currency exchange rates, and concerns over U.S. competitiveness. China's economic boom and soaring demand for resources (now easing) could be a source of future conflict. Taiwan remains an area of potential confrontation. And China's increasing investment in its military has raised concerns, being used in the United States to justify more investment in new weapons and defense systems. China is also in a special category for U.S. visas and export controls, due to a controversial 1999 U.S. congressional report charging China with espionage in nuclear and missile technologies. Despite being America's principal creditor, the Chinese have concerns about U.S. long-term intentions toward Asia and their country. There is a level of mistrust on both sides.

Science provides a common language that can help bridge cultures and serve to lessen mistrust and increase transparency. The Obama administration should work to raise S&T cooperation with China to a new level of partnership. The existing Joint S&T Commission, chaired by the President's Science Advisor and China's S&T minister, should meet annually (instead of every 2 years), and the 2009 meeting should lay out a 10-year plan of cooperative research focused on global challenges faced by both countries, including climate change, energy, food, health, and security. On the U.S. side, new funds will be needed to complement the agencies' domestic programs in these areas. The United States must also ensure that all qualified Chinese (and other foreign) scientists can obtain visas on a timely basis, and that our export controls protect national security but do not prevent U.S. corporations from fully participating in the global civil economy.‡ The United States and China must be true partners in seeking technical solutions that will support a global population of some nine billion people by 2050. Such cooperation can also mitigate inevitable tensions in the overall relationship—both splendid goals for the next 30 years.

— Norman P. Neureiter and Tom C. Wang

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*National Science Board Science and Engineering Indicators 2008, www.nsf.gov/statistics/seind08/.

†Wen Jiabao, *Science* 322, 649 (2008).

‡See *Beyond "Fortress America"* (National Academies Press, Washington, DC, 2009); available at www.nap.edu/catalog.php?record_id=12567.

