ARGUMENT

# Beijing's Fight for the Final Frontier

U.S. commercial space efforts are being undercut by aggressive Chinese plans.

BY GREG AUTRY | APRIL 2, 2019, 8:00 AM

While the eyes of the world were focused on China's Chang'e 4 lunar lander this January, Beijing was also quietly establishing a beachhead in America's booming commercial space sector. Chinese attempts to steal U.S. space tech go back to the space shuttle, but their systematic efforts to infiltrate California's commercial space firms beat anything I've seen in my 17 years of researching the new space industries. Attending a recent launch at Vandenberg Air Force Base, I asked a highly regarded new space executive if he had noticed China's predatory behavior. He looked straight at me and said, "Absolutely. We could lose this industry in 18 to 36 months."

This industry leader and others have shared their fear that the United States is handing another promising industry and its latest technological jewel over to its most dangerous global adversary. They have done so privately and asked for anonymity because they are afraid of being identified by venture capital firms they believe are increasingly beholden to Chinese partners. If this continues, tens of thousands of space careers may go the way of American PC, semiconductor, telecom, and solar manufacturing jobs.

U.S. President Donald Trump has declared that, "It is not enough to have an American presence in space—we must have American dominance in space." At this moment in history, that dominance is America's to lose. Its military space capabilities are peerless. NASA's robotic craft have explored the entire solar system from Mercury to Ultima Thule, and the agency will launch its fifth Mars rover next year. The next few years will see the deployment of no less than five new U.S. orbital and suborbital human-rated spacecraft, four of them commercial.

It's hard to overstate the activity in the U.S. commercial space world today. Just down the road from my office in Los Angeles there's Elon Musk's SpaceX as well as a bevy of advanced small launch firms including Virgin Orbit (in Long Beach), Rocket Lab (Huntington Beach), and Relativity Space (El Segundo). These firms, several of them with foreign principals, have chosen to place their headquarters and manufacturing in the United States. They provide thousands of high-paying jobs for engineers, machinists, accountants, and support staff. There are also hundreds of U.S. satellite and space data firms receiving angel and venture-capital funding. According to Space Angels, $18 billion has been invested in entrepreneurial space firms by 534 companies. The value of successful space start-up exits also reached $40 billion. Bank of America predicts that the space economy will reach $2.7 trillion in 30 years.

The Trump administration is well aware of the commercial and international factors in the space dominance equation. The 2017 First Space Policy Directive requires the government to "Lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and to bring back to Earth new knowledge and opportunities." Vice President Mike Pence speaks regularly on this topic. The United States should welcome genuine space competitors from Japan, Israel, the United Kingdom, and other free nations. However, nominally commercial efforts from China are very concerning. They are often pawns in a wider government push by Beijing to dominate space, with the encouragement of President Xi Jinping. It is no surprise when nations favor their national space champions, but when Beijing's frames state-backed firms using military technology as private enterprises, it should be concerning.

I recently attended a workshop composed of thought leaders from industry, military, intelligence, and academia, where many anxieties were raised. The group was concerned that nearly every Chinese space "start-up" is either a state-owned operation, state-controlled spinoff from a state enterprise, or a virtual proxy of the Chinese army. For example, the new "commercial" line of Kuaizhou launch vehicles developed by the supposed start-up ExPace, billed as the first Chinese private rocket company, are actually built by the China Aerospace Science and Industry Corporation, a state-owned company that is a key part of China's defense industry. Their rockets are multistage solid rocket systems launched from transportable erector launchers, basically mobile intercontinental ballistic missile systems but with economic payloads and targets. ExPace announced they will set launch prices for the new Kuaizhou 11 at just $5,000 per kilogram, about 20

percent of the prevailing market rate for small launchers. While nobody seriously believes ExPace can make money at that price, state-owned enterprises don't need to. Their low prices may, however, scare investors out of backing Western start-ups. There are several ExPace look-alikes in the works, including OneSpace, Ispace, and Landspace. Given the rampant security paranoia in China at the moment, where even knives are given RFID tags to track them, I can't believe that the Chinese government would allow truly independent actors to build missiles.

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China's space aspirations are not limited to launch vehicles. They also have an ambitious supposedly commercial satellite program. Among these projects is the Jilin-1 constellation of Earth observation satellites from the "first commercial remote sensing satellite company in China," Chang Guang Satellite Technology. The firm plans to image every location on Earth every 10 minutes at better than one meter resolution and provide the data for cheap, challenging U.S. start-ups like Planet and BlackSky. According to the party-run newspaper *Global Times*, Chang Guang belongs to the Changchun Institute of Optics, Fine Mechanics, and Physics under the Chinese Academy of Sciences. This supposedly commercial firm's website reports that it's led by loyal members of the Communist Party and brags that as a firm "the proportion of Party members is about 43%." The site also notes, "It is a young and vigorous Communist Party member team with high fighting capacity." In today's politically paranoid China, even genuinely private enterprises sometimes resort to such language, but its ownership clearly indicates state control.

At the same time, Chinese investors, often covertly backed by their government, are lining up to invest in U.S. satellite firms. This may be part of a multipronged strategy used very successfully in the solar power industry. China invested in U.S. solar firms, many of which had large subsidies from federal, state, and local renewable energy programs, gaining access to the companies. A unit of the Chinese military then hacked those firms and transferred their technology to the Chinese competitors. According to the U.S.

International Trade Commission, Chinese firms then dumped cells and modules onto the global market far below cost. The Chinese could then buy up the firms' assets at auction in bankruptcy.

Global IP, a California satellite operator that holds some valuable orbital slots, recently suffered a hard lesson in Chinese investment strategy. The founders of Global IP allege in a January lawsuit that a nominally private Hong Kong investment group approached the firm with a funding scheme that resulted in China Orient Asset Management Co., a Chinese government entity, taking control of their board of directors via shell companies in the British Virgin Islands. Boeing, which had been manufacturing the high-tech satellites, was caught by surprise and pulled out of the contract.

Cloud Constellation, another Southern California firm, has recently accepted $100 million in investment from another Hong Kong private investment firm to build its SpaceBelt network of secure data storage satellites. According to a report from *SpaceNews*, Cloud Constellation CEO Cliff Beek said that his company "will retain majority ownership of itself and is not worried about having Chinese investment." Those who assume such commercial transactions are always benign should consider the Hong Kong entrepreneur named Xu Zengping, who in 2002 purchased an incomplete Soviet aircraft carrier, promising to repurpose it into a floating casino. Instead it was handed over to the Chinese navy and refitted, and it is now busy intimidating China's Asian neighbors. Today, Xu openly brags in interviews about his deception, saying, "Now everyone knows the floating casino is also a cover behind the stealth operation … I needed to try every means to let the outside world believe the deal was just a pure personal investment."

In the 1990 to 1991 Gulf War, the dramatic demonstrations of GPS-guided munitions and armored divisions equipped with satellite reconnaissance and communications made it clear that U.S. superiority in space had rendered its troops, planes, ships, and missiles peerless on the battlefield. China's military has been clear in its determination to remove that advantage.

Whoever controls the Earth imaging and communications satellite constellations will monitor and control who sees what, and who says what to whom. If the U.S.-based Planet or BlackSky provide global imaging services, you'll likely see almost everything going on around the Earth, and the democratic, albeit imperfect, U.S. government will call the shots on national security choices. If the data is misused by governmental agencies, there

will be functional legal channels to challenge and correct that, and free press outlets to cover it. If the Chinese Communist Party runs the eyes in the sky, you will not see what is going on in Tibet or the re-education camps where a million or more members of mostly Muslim ethnic minorities are locked up in Xinjiang. That's good reason to fear the Chinese party-state running the globe's space-based data networks or directing the emerging "internet of things" satellites that will eventually control everything from your toaster to your pacemaker.

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The U.S. government must be stalwart in its commitment to maintaining absolute superiority in space launch, satellite manufacturing, orbit operations, and human spaceflight, whatever that requires. Congress must recommit to that goal in a bipartisan show of support for U.S. national security, civil rights, and the future of our species. Maintaining control of America's own companies is fundamental to that. Congress must pass legislation blacklisting any investment of any amount from aggressor states and their citizens into the commercial space sector.

The countries listed under International Traffic in Arms Regulations 126.1, including China, Iran, North Korea, and Syria, are a good start for the blacklist—even as the United States recognizes that the major threat is China. The restriction must also identify any entity controlled by or possibly controlled by one of these governments through domestic or international proxies. Congress should also establish a white list of countries where investment, cooperation, and partnering is permitted. Given the past record, every Chinese space investment should be referred to the Committee on Foreign Investment in the United States for a careful review to ensure that the Chinese government is not behind the deal. Countries wishing to be assigned to the white list must agree to identify and shut down Chinese proxies (such as the British Virgin Islands firms used to ensnare Global IP) operating under the laws of their nation in exchange for more ready access to the U.S. market and governmental space contracts. Previous efforts to control technology transfer were often failures. Well-intentioned laws must not drive others into China's arms in the

process of strengthening U.S. resolve. Until recently, the items on the United States Munitions List have been too broadly interpreted and too slow to be updated. The inability for many countries to access U.S. satellite and launch technology in an efficient and responsive manner was credited with stimulating China's own satellite-building business. The system must be simple, enforceable, and dynamic, which can be achieved by frequently scheduled reviews of what technologies are restricted, as well as of countries on the black and white lists.

The United States must also encourage domestic funds to spend their money at home and not support China's plans for space hegemony. This involves education as well as favorable tax treatments, such as the often-proposed Zero G, Zero Tax initiative. It must also encourage foreign investments that align with its national goals and guide start-ups to select capital that will allow them and their investors full participation in U.S. government-led business opportunities. As Mike Gold of Maxar, a U.S. space technology firm with strong Canadian connections, suggested, "When it comes to investment controls, the government should erect higher walls around smaller areas." The wall around Chinese investments in U.S. commercial space firms should be visible from orbit.

**Greg Autry** is the director of the Southern California Commercial Spaceflight Initiative at the University of Southern California. He served on the Trump transition team at NASA and is the co-author of *Death by China* (with Peter Navarro).

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