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Power and Pride: Two Space Age Products

China's become a space power, solving technological challenges and earning acclaim and respect

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By TOM WORGER

In space exploration's short history, only a few events have really captured public attention. From Sputnik's launch fifty years ago with its distinctive radio beep to human expeditions--including the moon landings and space stations and on to the remarkable Mars probes--forays into space have been fascinating, educational and symbols of human and national triumph.

What many might neglect to include in such a timeline, however, is the steady melody of The East is Red being played between 441 and 2386 kilometers above Earth. That was the tune broadcast by a satellite of the same name (Dong Fang Hong 1, in Chinese). The Chinese launched the satellite on April 24, 1970, and the tune was broadcast throughout the twenty-eight-day life of the satellite. Dong Fang Hong 1 was followed by dozens more over the next three decades.

Dong Fang Hong 1 and the rocket that carried it were both constructed entirely by the Chinese. The Soviet Union offered limited technological aid during the 1950s, but with the Sino-Soviet split at the end of the decade, the Chinese were left to progress on their own. And progress they have, becoming only the third nation to send a person into space in 2003 and recently succeeding with their first lunar orbiter.

Leroy Chiao, a former NASA astronaut, said he is impressed with what the Chinese have achieved since the Dong Fang Hong 1 launch. Earlier this year, he met with Chinese colleagues and toured their training facility. In addition to speaking with three Chinese taikonauts, Chiao met Chen Shanguan, the Director of China's Astronaut Research and Training Center. During his visit, Chiao evaluated the flight simulator used by Chinese taikonauts. While noticing many similarities to the Russian design, Chiao said progress in the Chinese model was present. "It's got more capability, it's larger..." he said in an interview with US-China Today. "They've kind of taken a step further. The technology is good. It's certainly not backwards or antiquated."

And China's government has big expectations for its space program. The China National Space Administration's (CNSA) website lays out its specific goals concerning the moon. The lunar orbiter is to be followed by a landing vehicle and ultimately a manned mission. Though the plans are ambitious, Chiao said he thinks they are not unreasonable. They've been very cautious about setting their goals to be realistic," Chiao said. "So far they've been hitting them."

The Chang'e 1 lunar orbiter, launched in October of last year, has already sent back its first images, which Premier Wen Jiabao unveiled for the public on November 26. The satellite was launched on the Long March 3A rocket, a descendant of Russian V-2 designs handed down from the era of technological cooperation and an example of how the Chinese created a working program from decades-old designs and their own research and development.

Commerce has also helped propel the Chinese space program. Chinese telecommunications firms are required to utilize the national space program to launch their satellites and that program has also profitably launched satellites for the firms of other nations. "The only way you can really test a rocket is by launching it..." said Ryan Zelnio, a former employee of Loral Space and Communications and author of The Poli-Space Peer Review weblog, "but (it is) very expensive to launch a rocket, so generally you want to have a payload on there (to offset the cost of the rocket test)."

Several American firms have helped to make this possible. Eager to get their satellites into space, these companies had few options after the 1986 Challenger disaster grounded the U.S. space shuttle program. The U.S. government had planned to launch many of its own satellites with the shuttle. Once they were grounded, those government satellites bumped commercial ones from the U.S. launch schedule. Firms turned to the Chinese (and the Russians) to launch their satellites. The lower pricetags of the Chinese launches, which used Long March rockets, was an added bonus. Brent Scowcroft, national security advisor to President George H.W. Bush, said in a 1998 interview with the Washington Post that Bush administration policymakers determined during the early 1990s that it would be better for the United States to maintain its dominance in critical and profitable satellite technologies by allowing other countries to develop lower-profit launch capabilities. As Scowcroft said, "The launcher is just a truck."

The U.S. government helped to facilitate this by relaxing control of space technologies. The U.S. International Traffic in Arms Regulations (ITAR) permitted this until two failed launches in 1995 and 1996. Two Long March rockets carrying a Hughes-built spacecraft and a Space Systems/Loral-built spacecraft failed. In the ensuing investigation, Hughes, Loral and the Chinese worked together to find the causes of these expensive accidents. Insurance companies required the American firms to assist in this effort as a condition of insuring any future launch of their satellites aboard Chinese rockets.

According to a five-volume U.S. House of Representatives special committee report completed in December 1998, Hughes's and Loral's assistance to Chinese missile-flaw investigators weakened U.S. national security. Some, including Central Intelligence Agency investigators, believed the technology transferred by the companies to the Chinese was not especially significant. Ties between Loral's chairman and the Clinton administration only further complicated the issue.

Some alleged these ties caused the administration to permit the export of certain technologies. Criminal charges against Loral and Hughes were eventually dropped, but they were charged with violating the requirement they secure proper export licenses. In the end, Loral agreed in 2002 to a \$14 million fine and to the requirement it spend \$6 million to ensure compliance with technology export controls. In 2003, Hughes (and Boeing, which purchased its satellite operations in 2000) agreed to pay a \$20 million fine and to spend \$12 million on improved export compliance.

This incident sparked tremendous debate. One important outcome was that authority to approve requests to transfer sensitive technologies was returned to the U.S. Department of State. President Clinton had transferred this authority to the Department of Commerce in 1996. In addition, orders were given that neither U.S. satellite manufacturers nor component manufacturers were allowed to launch technology from a Chinese rocket.

The justification for these regulations comes from a long-standing fear that such technology will strengthen foreign military capabilities. "There are obvious military potentials with space," Zelnio said. "Everything in space is dual use," meaning the technology can be used for scientific purposes as well as military ones. "An ICBM is just a rocket with a nuclear bomb on it," he said.

Because of China's remarkable economic rise and the country's increased ability to invest in its military, many are American officials worry that critical technologies might be inadvertently transferred to China. Some argue that the People's Liberation Army (PLA), through various business operations, is already gaining access to such technologies. Beginning in 1998, however, the Chinese government ordered the army to yield its commercial ventures. William Overholt, director of the think tank RAND's Center for Asia-Pacific Policy, asserted during a presentation at USC in November 2007 that this effort has been largely successful and the PLA no longer has extensive commercial arms.

Some contend, however, that the Chinese army's withdrawal from business has not lessened its ability to gain access to and utilize dual-use technologies. In a recent article in Proliferation Papers, Joan Johnson-Freese, the chair of the Department of National Securities Studies at the U.S. Naval War College, describes the potential of the Chinese government expanding militarily in space under the guise of using dual-use technology. "Dual-use technology makes it impossible to neatly present information on Chinese military space assets," she wrote.

Such concerns were exacerbated a year ago, when the Chinese military was able to destroy an old weather satellite with a missile. The motivation and implications of the test are still hotly debated. Previously, only the U.S. and Russia had successfully tested anti-satellite missiles. Neither the Americans nor the Russians have tested such weapons since 1985, a decision by the Chinese government to wait roughly two weeks to acknowledge the successful completion of the test fueled concerns about the regime's openness and intentions.

In her article, Johnson-Freese speculates on what might happen in a military confrontation between the United States and China following a Taiwanese declaration of independence. "Because the United States military is so dependent on space systems for virtually all activity," she wrote, "being able to disrupt or disable those systems might buy China the time it feels it needs to bring Taiwan back into the fold." Johnson-Freese also referred to the vulnerability in space as an American "Achilles' heel."

But China's space program is driven by much more than military strengthening. Just as America's space program generated technological advances that have enriched lives through their commercial applications, the Chinese also anticipate economic benefits as a result of technological progress.

Another vital product of successes in space is enhanced national pride. "One of the main reasons that they're in the manned space business is for world prestige," Chiao said. Johnson-Freese highlighted this as well, writing that the Chinese space program "provides both a positive rallying event for the Chinese population as a whole, providing a sense of pride and achievement, with spillover externally in terms of technical achievements being equated to national power," an ideology that she describes as "techno-nationalism."

China's leaders certainly expect these achievements to strengthen national self-esteem. They, in fact, said such successes should stir people of Chinese ethnicity wherever they are. According to China's official Xinhua News Agency, at the unveiling of the first photos taken by China's lunar orbiter, Premier Wen Jiabao drew on a letter from an overseas Chinese person to assert "that the farther the China-made satellite flew, the higher would the overseas Chinese hold their heads."

China's ambitious plans for the moon are only a part of their space exploration plans. China has long sought membership in the International Space Station program, hoping to attain a level of recognition from Western space-faring nations. Its membership has historically been blocked by the U.S. on the grounds that they lack both the funding and technological experience, but as Johnson-Freese points out, this did not prevent the inclusion of Brazil (whose own space program has encountered difficulties due to U.S. export control laws).

China is currently planning to build its own space station but is more immediately focused on a spacewalk slated for later this year. What happens in outer space ironically has proven to be continuing to affect international relations on Earth. There is cause for optimism in U.S.-China relations as a result of space travel. Chiao, who went on six space walks during his 229 days in space, is among those who anticipate more collaboration in the future. In fact, his invitation to meet with Chinese space officials itself may be seen as a sign of hope for increased contact. As Chiao said, "Although political relations aren't great right now between the U.S. and China, there will come a day when they improve again."

Tom Worger graduated from the University of California at San Diego in spring 2007, and is preparing to enter a Chinese Studies graduate program.

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