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Meeting the Chinese Space Challenge

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On December 27, the Chinese government released its third white paper on its space activities. The release of *China's Space Activities in 2011*¹ seems to establish a pattern of releasing white papers on space issues about every five years (previous ones were released in 2000 and 2006) and seems consistent with the finalization of national five-year plans (FYP).

The White Paper's Contents. In the latest edition, the Chinese State Council (whose Information Office issues the document) notes that the purposes of China's space program include not only improving understanding the earth in relation to the cosmos, as well as improvement of human civilization in general (consistent with the stated goals of many space powers), but also:

- Meeting the demands of economic, scientific, and technological development; national security; and social progress; and
- Improving China's scientific and cultural knowledge, protecting Chinese national rights and interests, and improving China's national comprehensive strength.

After detailing advances in China's space program since the last space white paper in 2006, the paper then lays out key objectives for the next five years. These include:

- New launch vehicles, including not only the heavy Long March 5 but also the Long March 6 and Long March 7;
- A range of new satellites, including a new high-resolution "earth observation satellite," as well as expansion of the current Beidou navigation constellation; and
- Improvements in its telemetry, tracking, and command (TT&C) capabilities, as well as completing the new launch facility on Hainan Island.

Especially noteworthy, the white paper not only reiterates ongoing efforts at expanded lunar exploration (including a sample retrieval effort) but specifically states that "China will conduct studies on the preliminary plan for a human lunar landing." This marks the first explicit official statement of such a goal at such a senior level and reflects high-level support for such a mission.

The paper observes that China's space program helps develop China's foundation of science and technology but also promotes both independent development and innovative development, enhanc-

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ing “its capabilities of independent innovation.” Therefore, the white paper notes, there will be “strengthening of innovation capability in space science and technology”—i.e., further high-level support for both industrial and academic space efforts, including “guaranteeing the sustainable and steady financial investment for space activities.” Given that China’s space industries are all state-owned enterprises, this would seem to suggest ready access to capital.

The white paper concludes with a review of various cooperative efforts that China has undertaken with other states, both bilaterally and multilaterally. In the next five years, the paper closes, Beijing will be interested in engaging the international space community in scientific research; developing better satellite applications; enhanced research and development on ground equipment, including TT&C capabilities; greater commercial activities, including importing and exporting entire satellites as well as associated ground equipment; and “technological cooperation on a space lab and a space station.”

Key Aspects of China’s Space Program. Several key characteristics of China’s space program are evident in this white paper.

It reflects *an ongoing willingness to devote substantial resources toward space* and indicates that Beijing will do so in terms of both basic science projects as well as prestige programs. Thus, the white paper states that China will develop not only multiple space labs but also a “dark matter probing satellite.” Indeed, the various programs listed suggest Chinese interest in fielding a space program competitive with the U.S. or Europe and far ahead of other Asian states.

That such projects, as well as studies regarding a human lunar mission, are specified in the space white paper also suggests *a consensus in the senior Chinese leadership about space priorities*. The white

paper provides an indication of major programmatic goals for the next FYP and that these have been agreed upon by key Chinese decision makers and bureaucracies.

The list of projects also suggests *a growing explicit national security focus within the Chinese space effort*. One major goal, for example, is a high-resolution imaging satellite as part of a “stable, all-weather, 24-hour multi-spectral, various-resolution earth observation system.” Having previously deferred developing such a capability, China now appears intent on developing its own network of spy satellites.

China’s Space Program in the National Security Context. The decision to pursue such systems provides an indication of steady Chinese interest in the military role of space.² While national security is only briefly mentioned within the white paper (with no reference to the 2007 ASAT test), this is undoubtedly a key consideration for Chinese planners.

Chinese military writings emphasize the importance of operations in space and cyberspace, as well as the traditional land, sea, and air environments.³ This partly reflects Chinese lessons learned from their analysis of recent international conflicts, all of which have noted the importance of space systems. Moreover, the ability to establish space dominance or space control (*zhitian quan*) is part of the “new historic missions” of the PLA. Laid out by Hu Jintao in 2004, these charge the military with several tasks, including safeguarding China’s expanding national interests across the range of potential conflict domains—including outer space and cyberspace.

Recent discussions of the “historic missions” suggest that certain technological areas, including space, will be playing an increasing role in PLA modernization efforts. In order to fulfill the “new phase of the military’s historic missions in the new century,”

1. See the full English language text provided by the Chinese State Council at http://www.chinadaily.com.cn/cndy/2011-12/30/content_14354558.htm (January 12, 2012).
2. China’s space program is largely run by the General Armaments Department of the People’s Liberation Army, which manages all of China’s launch and TT&C facilities.
3. See, for example, Chang Xianqi, *Military Astronautics*, 2nd ed. (Beijing: National Defense Industries Press, 2004).

Hu in July talked about accelerating changes in how combat power is generated, stating that this is now the main line (*zhuxian*).⁴

This theme has been reiterated by various Chinese military officers, most recently in conjunction with the PLA's All-Army Military Equipment Work Commission, whose representatives met Hu in December. Widely reported in the Chinese press at the time, the commission indicated that its task was to push further developments in weapons and equipment construction, using the achievements of the 11th FYP as a springboard.⁵

Given the Chinese military space achievements in the 11th FYP—including the ASAT test, the exo-atmospheric missile defense test of January 2010, and orbiting a host of new satellites—the next five years are therefore likely to see major advances in China's militarily relevant space capabilities. Several of the projects outlined in the space white paper—such as the high resolution observation satellites, the improvement of facilities for “receiving, processing, distributing, and applying satellite data,” and the construction of a “system to protect spacecraft from space debris”—provide some clue about potential priorities.

What the U.S. Should Do.

The U.S. should:

- **Modernize American space capabilities.** The U.S., with its expeditionary role, needs space systems to operate in the western Pacific far more than the PRC does. Therefore, it is essential that the U.S. maintain its lead, whether it is in reconnaissance and observation platforms, weather monitoring systems, or position, navigation, and timing arrays. This includes ensuring that its systems are able to operate even in “highly complex electromagnetic environments,” i.e., in the face of opposition jamming or cyber attacks.

- **Improve U.S. space situational awareness.** An essential element of space deterrence is the ability to attribute any attacks against U.S. space systems to particular players and sources. This need not be solely a U.S. government task, however. The creation of a Combined Space Operations Center and efforts to improve interaction with the commercial space community regarding space situational awareness should be encouraged.
- **Be cautious in engaging in space cooperation and interaction.** The Chinese position emphasizing indigenous development, echoing their focus on “indigenous innovation,” suggests that Beijing will focus more on political than budgetary burden-sharing. It also suggests that China will pursue technological “cooperation” that favors themselves in any joint space ventures, such as demanding establishment of R&D facilities in China and preferential transfers of technology. As important, Chinese interest in legal warfare should serve as a caution toward creating new international regimes or codes of conduct where Beijing may well be able to constrain American efforts at preparing for potential space conflicts. Cooperation needs to benefit both sides, not just Chinese state-owned champions, and should not provide China with ready ammunition for future legal warfare measures.

Do Not Ignore Space. For the U.S., the ability to meet its commitments in the Pacific depends heavily on maintaining not only a substantial navy but also a robust space capability. China's space white paper makes clear that it is intent on advancing its space footprint. The U.S. should not ignore its implications.

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4. Hu Jintao, “Firmly and Unswervingly Following the Path of Socialism with Chinese Characteristics, Striving to Build a Socialist, Culturally Strong Nation,” July 1, 2011, at <http://news.cuit.edu.cn/NewsCont.asp?type=1071&Id=34326> (January 12, 2012).

5. Li Gangshe, “Hu Jintao Separately Meets with Naval Party Representatives and All-Army Equipment Work Commission Representatives,” *People's Daily*, December 7, 2011, at <http://politics.people.com.cn/GB/1024/16519757.html> (January 12, 2012).