Interview: Dr. Zhang Wei and Xu Yansong

An Opportunity for U.S.-China Cooperation in Space

Three years ago, when China became the third country in the world to launch a man into space, other spacefaring nations took notice of its ambitious and meticulously executed space program. Now China is readying its first deep-space mission, to the Moon, and plans a three-phase program for lunar development. China has international space cooperation agreements with more than a dozen nations, but not with the United States. Next month, NASA Administrator Mike Griffin will visit China, presenting the opportunity to move U.S.-China relations in a positive direction, to the benefit of both nations, and the Asia-Pacific region as a whole. China's space officials are hopeful that rather than using a "stick," the United States will choose to use the "carrot" of cooperation, to further its international relations with China.

Dr. Zhang Wei is the Director General of the Department of Foreign Affairs of the China National Space Administration. Xu Yansong works in the Space Administration's Department of Foreign Affairs, and has accompanied Chinese space officials on visits to the United States. They spoke with Marsha Freeman on July 25 in Beijing, during the conference of the International Lunar Exploration Working Group.

EIR: There is not very much known about the Chinese space program in the United States, and various commentators report that they cannot understand why China, as a developing country, is putting so much money and resources into space development, when there are so many economic problems to solve. What is focus of the space program in China?

Zhang: The first and most important question, is why we are developing space technology. Most people thought at the beginning that space technology is just technology. But after five years, when we have concluded our experiments and have had many results, we found that we are not only developing our technology, but we are mainly developing our applications, and also science.

Dr, Zhang Wei

When we published the first white paper about China's space program, we had three main areas. The first is technology, which is the foundation. The second is space applications. Here we mention communications, remote sensing, and also navigation. The third area is space science. After that white paper was published, most Chinese people knew that space technology is the targetted objective for applications and for supporting science. So for the last five years, we did a lot of applications work. We just concluded that, and then we started our big space science program, like Double Star, cooperatively with ESA [the European Space Agency]. We think that is the right direction.

More and more, we noticed that the most important use of space technology is to support our economic development. If not, to most people, you are just showing them some interesting things. This way more people will understand and support it.

In China we are supporting our country's strategy in the economics areas, and science is also included in this field. We just announced our medium and long-term scientific strategy. This way, people will understand more about the Earth, about the future of life and space. They will increase their knowledge of these issues. They will know that man can stay in low Earth orbit, what the environment is, and how to get farther than the Moon.

The Moon is the first stop; then Mars, then farther away. People want to know that. If you show pictures of this new environment, they will be excited, and we will get more understanding and support, especially for young people. That is why tomorrow morning [at the conference] we will have more than 300 students from universities and middle schools for our public day, to show them why we are going to the Moon, how to get there, and what other countries are doing, to get more and more people to join our enterprise and to continue our work. That is most important.

In the United States this was also true, when young people were in middle school, during your Apollo program. It is our duty to let our kids know that. We figure out the picture, but they have to know it is *their* responsibility; they have to continue our enterprise. It is very important for the next generation to continue.

EIR: One of the major impacts of the Apollo program in the United States was the tremendous upgrade of industry. To

do things in space you had to develop new manufacturing techniques with a new level of precision. Have you seen any transfer of technology yet from the high-technology space industry to other parts of your economy?

Zhang: That is part of our application of space technology. Typically, in remote sensing, we are using those products to study cities that are developing, and in agriculture, but this is just in the experimental stage. We're doing work in basic research, such as with seeds, using the microgravity environment in orbit, to study seeds and plants and how their seeds are changing, and to find some new characteristics. It may be a good or bad change; we're not sure, but we will find out. Potentially, it could be a new business for this area. You know that China has a lot of farmers, more than the people in the cities. This is for them, for their productivity.

In the real transfer of technology from space, we had some high-grade products and devices when we developed sensors. After that they were used in manufacturing, to detect different product characteristics. Space product manufacturing is very accurate, and we are using the high-speed software and the machinery in other industrial areas, and also computer knowledge.

This kind of technology is widely used for technology transfer. In the medical equipment industry, they are making equipment that is first used in the space industry; we call them commercial applications.

In China, the first color televisions were manufactured in the space industry. Now, it's a joint venture. Also in machinery and some other areas. Because it's high-tech, they can do any new program in high technology. They have skilled and creative people.

EIR: The Soviet Union was never really able to transfer technology from its space program to its civilian industry. But this space "science driver" is very important, as it pushes forward the rest of the economy.

Zhang: We have our own policy to push this issue. The transfer is sometimes difficult. People have their own know-how, and if you transfer this technology to new areas of industry, sometimes you have to transfer not only the knowledge of the technology, but the people. In our experience, the best technology transfer involves transfering many experienced engineers. When you finish a project or program, then you can transfer the people and the technology.

EIR: In China, science and technology have been the driver for the economic development. We visited the Science and Technology Museum, which is an excellent pedagogical museum, with hands-on work for children to learn basic scientific principles. What effect has China's commitment to the space program had on education, and the number of students studying science and technology?

Zhang: This is most important. We are planning to build a new national science and technology museum, in Beijing, [in time for the 2008 Olympics]. More and more people are interested in that.

Xu: We have seven universities that are under the China National Space Administration. They are providing space-capable people, such as the Harbin Institute of Technology, which is a very old school, and in Beijing there is the Beijing University of Aeronautics and Astronautics, and a number of other univerisities. The top university, where our President graduated, Tsingua University, has a joint venture with Surrey University in England, providing for the manufacture of small satellites. That is on the university level.

In primary schools and secondary schools, we have a lot of publications on the lunar mission, and there is a deep understanding of the Chinese programs by the students in primary schools and kindergartens. China is the number-three country to launch a man into space. This has been a matter of national pride for the public. It not only brings inspiration to young children, but also is a technology-driven locomotive for many technologies.

Xu Yansong

On your question about how the Apollo program brought a lot of industry upgrading and inspiration in the United States: We understand that in the 1960s, the United States had an ambitious space program, and the budget meant that whatever NASA needed, it would have it, to realize the Apollo program. Of course, when the dust settled, the industry found that they had gold in their hands.

In China, we don't have such a program as an "unbudgeted" program. Soon after the Apollo program, the policy was reevaluated. We understand that now, NASA is going back to the Moon again, and many other countries are joining this effort.

However, previously, you mentioned many provocations over Chinese policies, especially the U.S. policy on space. You mentioned that even during the Cold War, when there was no communication in other areas, you had the docking of the Apollo module with the Soyuz capsule. But we understand the U.S. policy in space differs for different countries. To Russia, it is a carrot. To India, it is a stick and carrot. And toward China, at this moment, it is a stick only.

As you said, NASA Administrator Mike Griffin is coming in September, and that will be an ice-breaking trip. We certainly hope it will be. Mr. Sun Laiyan, the Administrator of the China National Space Administration, met with Mr. Sean O'Keefe, the previous NASA Administrator, in September 2004, and that meeting was one hour and was supervised by the State Department, the China/Mongolia office, and I was there for that discussion. It was not substantially progressive.

In April this year, I accompanied Mr. Luo Ge, Vice Administrator of CNSA, to NASA, where he met with Mr. [Michael] O'Brien, Deputy Administrator of NASA; also a meeting supervised by the State Department. And there was no substantial progress. However, Mr. Luo made presentations at CSIS, the Center for Strategic and International Studies, and that was heard by many people in Congress and people from different industries. Also, Mr. Luo went to Colorado Springs, for the 22nd National Space Symposium, where he also spoke to more than a thousand people in the audience. He elaborated on the Chinese space program.

We understand that during Mike Griffin's presentation to Congress on the 2007 NASA budget, he was questioned by Congress many times about Chinese space programs. The Congress asked Mr. Griffin to report to Congress in one month, from open sources, on the Chinese space programs. We understand that the U.S. wants to understand more about the Chinese space program. This is, I think, a good opportunity for both countries to better understand each other, especially to find common courses, find less sensitive areas, and explore the possibilities, not only on technical issues but also the scientific and application areas.

Common interest areas are space debris, space science exploration, applications from remote sensing in agriculture and other civil areas. These are common areas where we can work together; maybe not involving rocket technology and satellite sensors and software development, but less sensitive areas, could be areas of common interest. In China, we look forward to Mr. Griffin's visit in September. We will show him the launching site, we'll show him the manufacturing site, we'll bring him to Shanghai to see the "Chinese Chicago."

EIR: Unlike Sean O'Keefe, Mike Griffin is a scientist and an engineer. I think he will be very impressed with the Chinese space facilities. Sean O'Keefe was a protégé of Vice President Cheney, and political appointee who was an accountant, and represented the "stick" approach to relations with China.

Despite what you might think, NASA never gets as much money as it needs. I know that NASA's budget of $16 billion sounds like an enormous amount of money. However, the budget situation is so bad that every science program has been cut back. Last week, the Senate Appropriations committee voted to increase NASA's budget by $1 billion because of the cuts. There are people in Congress who are aware of the progress in the Chinese space program.

What do you think of the bipartisan proposal that has been made by Representatives Mark Kirk, Republican from Illinois, and Rick Larsen, Democrat from Washington, for space cooperation with China? They were very impressed with China's capabilities, during their visit here last Spring. One of their proposals was for a common docking mechanism, so your Shenzhou would be able to dock with the International Space Station or the Space Shuttle, in case of an emergency.

Xu: I think it is a very good idea. Outer space is for all people to explore and anything could happen. If there is some emergency, and China has the capability and China is willing to do a rescue from orbit, that was what they discussed with us. There is also a proposal that any Americans who are not sure about China and the Chinese space program, are not sure they should work with China, they should come to China and see for themselves, and they will be impressed.

I think Mr. Larson and Kirk visited the manned space facilities and were also taken to different facilities, This gave them a better understanding of the space programs in China. There are a number of common interest areas without technology transfer; at least a rescue capability for docking a Chinese Shenzhou to the Space Shuttle or International Space Station. In the future, we do not want to exclude the possibility of working on the International Space Station. But, of course, that is something we will discuss with NASA Administrator Griffin.

As you said, your budget is $16 billion, with $7 billion spent on the remaining Shuttle missions before it is retired. The Hubble Space Telescope is retiring. It is too bad NASA is retiring a lot of missions, and cutting back a lot of scientific efforts. That is not sustainable. To have deep space exploration programs, NASA is looking for international cooperation. This is, of course, one way to pool resources together. But we think the U.S. should certainly invest more on space, especially space exploration, as it is the vision of the President, and it has been "legalized," by the Congress. There should be a framework where there is more in the budget. The Senate adding $1 billion is certainly good news. But I think the U.S. should hide the stick and bring back the carrot to China.

EIR: I think the U.S. is upset by the Chinese participation in the European Galileo navigation satellite system. And people don't generally know that China already has a very active cooperative space program with Brazil. Many countries are already cooperating in space.

Xu: China also has its own navigation satellite system. And in addition to geostationary satellites, we also have a similar regional system called Compass, which is similar to GPS [the U.S. Global Positioning System] and Galileo.

EIR: Are you working with the Russians, or thinking about a rescue capability with the Russian Soyuz manned spacecraft, or with their new vehicle under development, the "Clipper?"

Xu: Not at this moment. The Clipper has been put off. They are going to start with a smaller one; another concept, as I read a few weeks ago. Clipper was not funded by the Russian federal government. Japan and Europe were trying to join that program. Europe has taken the strategic point of being able to launch the Russian Soyuz from Kourou, which is being paid for by the European Space Agency. The Russians aren't

funding it. As you said, the Russians are not very good at using space technology in other areas.

China is in the same situation, where most of these space enterprises are state-owned, unlike the U.S., where everything is commercialized, especially in the space industry, China has state-owned enterprises. These technology companies are separate from commercial ties, so that is also a gap to fill.

In China there are many players in the space arena, like the Chinese Academy of Sciences, and the Ministry of Science and Technology, and industries. These can help in some way, providing the funds in certain areas. But I think, internationally speaking, there are many new directions that China is keeping a close eye on. I think you and other people who are reporting on the progress in China in the United States, are acting as our voice to the United States. This is something real that people in the United States should understand. As you said, the China-Brazil cooperation few people know about.

EIR: Are there other developing countries that you are starting cooperation programs with?
Zhang: We started on the technology level with ESA, and in the science areas, with the Italian Space Agency, and also with France. We discussed many potential areas, even in the ocean area, observations, and also in space science. There is a new project that was discussed at the COSPAR meeting last week. We need to do a preliminary study of it.
Xu: As Dr. Zhang said, we have substantial cooperation with different countries. The new proposal is very interesting. There would be three satellites launched into orbit, and they would be at fixed locations: one over the North Pole, one over the South Pole, one is between the Sun and the Earth. Between the Sun and Earth, the satelllite would monitor the activity of solar storms. The two other satellites would monitor the aurora. This will be a very interesting scientific mission. As Dr. Zhang said, there may be programs like Double Star, cooperating in oceanography satellites with the French, with the Italians on hard X-ray astronomy. There are many areas where we are cooperating with all countries.

It is sad to say that we have intergovernmental agency agreements with 16 countries, all spacefaring nations, excluding Japan and the U.S. We have very high-level cooperation with the Russians, on the Prime Ministers' level. We have intergovernmental agreements with the European Space Agency, with France, with Brazil, and we have interagency agreements with India, Canada, Argentina, with most of the European countries. And we need to work with NASA. We need a framework, and we need a more long-term, stable relationship, so we can work together.

With developing countries in the Asia/Pacific region, we have a regional entity, the Asia Pacific Space Cooperation Organization. It will be similar to ESA. It is an Asian space agency. According to the convention we agreed to early this year, five countries have signed the ratification instrument, and when they are sent to Beijing, it will be established. So far, four countries have been ratified and we are expecting the number five country. Then this international organization will start functioning.

EIR: And it will be headquartered in Beijing?
Xu: Yes.

EIR: What will be its major activites?
Xu: Space technology applications, especially in remote sensing; scientific research, education, and training. These are some of the domains we might be pursuing, as a starting point. Maybe in the future, space economy for the Asian region.

EIR: That is similar to what Brazil has done in remote sensing, where they are a center for all of Latin America. They bring young people in from many countries to train and educate them, and teach them how to use the technology.
Xu: We started a training program five years ago, and we have eight training courses already completed. Some of them are short courses. These are for training in remote sensing applications, meteorology, and telecommunications. Twenty-one countries are participating.

You can see from the dining hall, people use knives and forks, hands, and chop sticks. That is a cultural exchange that you can see with your own eyes, if there is a buffet.

EIR: In Asia, China, Japan, and India are the major leaders in science and technology. And there are political problems among all three at different times, but it is important to bring them, and all of the other Asian countries, into cooperative space projects.
Xu: Developing countries should unify with space technologies, first with applications with remote sensing and meteorology, and then maybe space technology such as satellites, and enable these countries to have their own space programs, and build their own satellite centers.
Zhang: Overall, we hope to have more international understanding, and hope you can bring back that information from your trip to China.