

China preps satellite to help detect quakes

Spacecraft, set for 2016 launch, will find data on electromagnetic signals

By WANG QIAN
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China's first test satellite for detecting electromagnetic anomalies from space will launch in 2016 in a move that is aimed at improving the country's earthquake monitoring network and moving its seismological science forward.

Yuan Shigeng, project manager for the satellite, said the polar-orbiting device will carry eight payloads, including a search-oil magnetometer, electric field detector, energetic particle sensors designed by China and Italy, and a Langmuir probe and plasma analyzer.

The satellite will collect and transmit data on electromagnetic signals in the Earth's ionosphere at altitudes of 507 km.

During its mission life of five years, the satellite will collect and supply data for research on earthquake monitoring, earth science and space science.

The China Earthquake Administration will be the main client for the satellite.

Shen Xuhui, a professor at the institute of earthquake science at the CEA, said the satellite's detection capabilities include large-scale, highly dynamic, multi-parameter and all-weather features, which will be important for the current ground monitoring network.

Scientists hope any major breakthrough in the research will help them understand earthquakes better so lives can be saved.

"Through these data, we try to understand what natural warnings, such as changes in electromagnetic signals, are indicating prior to earthquakes," Shen said.

China experienced 43 earthquakes of above magnitude-5.0 last year, twice the annual number over the past three decades, that claimed thousands of lives, according to statistics released by the Ministry of Civil Affairs.

Earthquakes are a sudden release of energy caused by the sliding of the Earth's crust along fault lines, and changes to fluorescent, infra-

red and magnetic signals can be detected in advance.

China's latest project started in 2003 and its test satellite is now in the preliminary design stage. Shen has been involved in the project from the start.

"Among the many signals that nature may provide before earthquakes occur, we've chosen magnetic ones because we are technically and economically ready," Shen said.

Roberto Battiston, a professor at the University of Trento in Italy, said that studying magnetic and electric fields is a wise choice for earthquake science.

Over the last 30 years, various studies have suggested a link between seismic activity and the precipitation of energetic electrons trapped in the Van Allen Belts, Battiston said.

Studies suggest that strong seismic activity often causes electromagnetic anomalies in the Earth's atmosphere, ionosphere and magnetosphere, aiding the monitoring and prediction of earthquakes.

Battiston said the collaboration between Italy and China is "extremely effective" and he looks forward to the first data from China's electromagnetic satellite.

Seismologists in China have been working with other countries including France, Italy, Russia and Ukraine that have their own advantages in seismo-electromagnetic research.

Battiston said earthquakes are a global phenomenon, and the development of techniques to mitigate their damage will greatly benefit from international collaboration.

With the successful launch of the satellite, China will join a select group of nations that have their own earthquake monitoring satellites, which could broaden international collaboration in the field.

Dimitar Ouzounov, a professor of earth sciences at Chapman University in California, also spoke highly of China's project, saying it "provides an excellent opportunity to advance the well-integrated space-ground system in earthquake monitoring in the near future in China."

China's satellite mission could become the focal point for future international cooperation among many scientists in space physics, electromagnetic observation and satellite methodologies for earthquake monitoring and warnings, the professor said.



SHIPSHAPE AND SEAWORTHY

PHOTO BY XU CHONGDE / FOR CHINA DAILY

A miniature aircraft carrier made by retiree Wen Yuzhu is being launched for testing on Tuesday in Qingdao, Shandong province. Wen (far left) said the converted boat, which measures 12 meters long and 3 meters wide, can carry up to 20 people.

Students take fourth in computer test

By WANG HONGYI
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While 15-year-old Shanghai students are adept at solving problems with the help of computers, their skills don't measure up to their extraordinary abilities in math, reading and science.

Shanghai students tied for fourth place in a new computer-based test on their problem-solving abilities under the Program for International Student Assessment. The results were released by the Paris-based Organization for Economic Cooperation and Development on Tuesday.

The triennial program aims to rate the performance of 15-year-old students in the OECD and other countries

through a range of tests in math, English and science.

A computer-based problem-solving test was added into the test option list in 2012. Lu Jing, secretary-general of the Shanghai PISA Project, said the computer-based test aims to find out how proficiently a student uses technology to solve problems in an examination context.

About 85,000 students, including 2,372 from Shanghai, took the 40-minute exam. They were selected from 510,000 students from 65 countries and areas who had taken the PISA paper-based test in April 2012.

Shanghai students tied with their peers from Macao and Hong Kong for fourth place in the exam. Students from Singapore and South Korea tied for first place, with Japan in third.

In 2009 and 2012, Shanghai

students ranked first in the paper-based PISA tests.

"Compared with their competence in math, reading and science, Shanghai students' computer problem-solving performance isn't as good," said Zhang Minxuan, program manager for Shanghai PISA.

But even so, Zhang said he believes the results were "unexpectedly good" considering the gap between Shanghai and Western countries in terms of the ability to use technology in studies.

Test results showed that 89.4 percent of Shanghai students reached a score of "Grade 2" or above, which means that they met the requirements of dealing with their future work and social lives.

Of those who reached Grade 2 or above, 18.3 per-

cent reached Grades 5 or 6, the highest level.

"This has too much to do with computer use in schools and at home," Zhang said. "Students should be encouraged to have more chances to work with technology in the future."

In recent years, Shanghai education authorities have promoted technology development and computer use for students. Tablets have been introduced into classrooms, which is believed to have helped improve computer proficiency.

"The result indicated that Shanghai students are better at solving static problems than interactive ones. In this regard, more open, practice-oriented and research-based study should be given to them," Zhang said.

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Chengdu sets sights on international education

By FU CHAO in Beijing
and LIYU in Chengdu

Chengdu aims to further open up its educational programs as it is "aiming higher toward good education with a global focus," said Huang Xinchu, the city's Party chief.

Major events and reforms in education put the city in the spotlight last year. It also got the attention of British Prime Minister David Cameron and US first lady Michelle Obama.

She gave a talk at No 7 High School in the capital of Sichuan province in late March during her high-profile visit to China.

The first lady made education the biggest concern of her seven-day trip. In Chengdu, she shared stories of her school days and talked with high school students about the importance of education.

In a travel journal entry on the White House website, Obama said she "thoroughly enjoyed" her stay at the school, where she took an English class and talked with students from rural schools through a distance learning system.

She said that the Chengdu school is "an extraordinary high school that uses the power of technology to bring educational opportunities to students across Southwest China."

When British Prime Minister Cameron visited a primary school in Chengdu late last year, he was also impressed by the school's English teaching methods.

Party Chief Huang noted that "what we can offer is beyond the basic stage where everyone has access to school education."

He said that the city government is developing Chengdu into an open and international hub.

"The future depends on young people. They need to have a global vision. We can give them that by training them in international standards," he said.

According to a statement from the municipal government, the city will step up efforts in opening up its edu-



WANG JING / CHINA DAILY

US first lady Michelle Obama joins in tai chi with students at the No 7 High School during her visit to Chengdu in late March.

cation sector by developing projects in which students can learn more about the world.

The statement also said that the government is trying to make the city a center of international education in western China by 2020.

Chengdu hosted the Education Forum for Asia last year, the second time it was home to the event.

Last December, Chengdu Jiaxiang Foreign Languages School co-founded an international school with Brockenhurst College in the United Kingdom. Scheduled to open by 2016, the school will grant diplomas valid in both countries. Lessons will be given both in Chinese and English.

By the end of 2013, 14 agreements for projects in educational coopera-

tion had been signed with seven countries including the UK, France, the United States, Australia and Finland.

As well, eight international training centers have been established for teachers in the city and 202 local primary schools have forged partnerships with overseas educational institutions.

Wuhou district, known before as the city's cultural and historic hub, has also become an educational center. Zongbei Middle School, a model for developing international education in the district, has a building used only for international events and projects such as Model United Nations classes and lessons from schools in Singapore and the UK carried over a distance learning system.



WANG XIWEI / FOR CHINA DAILY

British Prime Minister David Cameron plays table tennis with pupils at a primary school during his visit to the provincial capital in 2013.

"For our students, the world is their textbook" said a teacher from the middle school.

The school also has a Chinese promotion program that sends one or two teachers abroad to teach Chinese and learn foreign cultures every year.

Returning teachers then set up workshops or classes to share their experiences with their school peers.

The school also highlights classes and activities on cultures, international politics and economics.

With such schools and programs, Chengdu attracts many overseas students and sends local students to foreign countries for further study.

of Education.

There are now more than 230 university exchange students studying in Chengdu.

The city also provides support to companies that can offer scholarships to exchange students.

Local authorities released a regulation on scholarships for exchange students in March under which the city government grants an annual scholarship of up to 30,000 yuan (\$4,827) to each exchange student from foreign cities that have links with Chengdu.

The Ministry of Education has approved three schools for expatriate children in the city that have served more than 1,000 students.

In addition to bringing international vision to local schools, the city also

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countries

involved in partnering in education by 2013

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The future depends on young people. They need to have a global vision. We can give them that by training them in international standards.”

HUANG XINCHU
PARTY CHIEF OF CHENGDU

promotes Chinese culture in other countries.

Educational authorities wrote textbooks for students around the world that tells the story of the renowned ancient poet Du Fu who moved to Chengdu in 759 and lived there for four years. The material also covers famed contemporary writer Ba Jin, a Chengdu native.

Some 100 local teachers have participated in training programs to prepare for their overseas journeys to popularize Chinese culture.

The Hanban — an organization dedicated to spreading Chinese language and culture — together with the Overseas Chinese Affairs Office under the State Council chose more than 30 teachers from Chengdu to teach Chinese abroad.

Chengdu University established a Confucius Institute at the University of New Hampshire in the US, which has drawn more than 300 US students.

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