Students reach for stars with own satellite

NTU team's Velox-I is set to launch in 2013

By Hoe Pei Shan

IT WILL be a big lift for Singapore when the second locally made satellite – and the first to be built by students – is launched in 2013.

Called Velox-I, it is being put through its paces by Nanyang Technological University (NTU) engineering students in the Undergraduate Satellite Programme (USP) that was started in April last year.

Unlike a typical satellite that can weigh more than 1,200kg, Velox-I is made up of two tiny satellites, one weighing 3.5kg and the other 1.5kg.

Barely an arm's length, it looks like an oversized Lego block with solar-panelled wings that will spring open in space.

Slated to be launched in India or the United States in early 2013, it will have an NTU-designed camera with high-resolution, image-capturing capabilities and be able to conduct quantum physics experiments during its orbit.

The Velox-I project, which includes a student-built ground station on campus that picks up signals from space, has a budget of more than US$300,000 (S$366,000).

"This is not just a prototype, it's going to be up there in space and it's still hard to believe that students such as ourselves are a part of it," said Mr Tan Chun Kiat, 25, a recent NTU aerospace engineering graduate who had been involved in the project, at the university's unveiling of the satellite yesterday. "What if there were technical faults during orbit? What if it couldn't withstand the temperatures? We were apprehensive, even nervous, at the beginning, but having it come together piece by piece has been a great and challenging learning experience."

The team has conducted multiple vibration and space simulation tests to ensure that the contraption can withstand forces up to 10 times that of gravitational force during launch.

The first made-in-Singapore satellite – the 105kg X-Sat – was launched on April 20 after a nine-year collaboration between scientists and engineers from NTU and Singapore's defence research body DSO National Laboratories.

X-Sat has been monitoring environmental changes with images of erosion, forest fire and sea pollution.

Only two other countries in the region – Indonesia and Malaysia – have their own satellites in space.

"We wanted to work on something smaller, not only to lower costs but also to ensure it could be launched in a shorter period of time," said Associate Professor Low Kay Soon, 49, director of NTU's Satellite Research Centre.

"A smaller and cheaper satellite would also mean we could take more risks in experimenting with its capabilities and be able to test it locally."

Students get to work with industry partners such as the US Air Force Academy and University of Tokyo.

The USP, which takes in about 50 second- to final-year students annually, is the only space programme of its kind here as space science is a relatively unexplored field. NTU is considering developing the nation's first space engineering courses if interest grows, said Prof Low.

Said Ms Luo Jia Yu, 24, a mentor from NTU's engineering master's programme: "I had always wanted to venture into space science as it's a mysterious and intriguing world, and this was a rare chance for me to get a taste of it."

hpeishan@sph.com.sg