

Deep space classrooms

A visit to NASA centres helps motivate STEM learning, writes

Mal Chenu.

Bridget Dwyer went away from home for the first time to learn about ways to get a lot further from home.

The Marist Sisters' College Woolwich student has just returned from the United States, specifically the National Aeronautics and Space Administration (NASA) centres in Houston, Texas and Huntsville, Alabama.

"We met astronauts and engineers, saw Apollo and Saturn V rocket replicas and learned about their missions," says Bridget, 13. "Every morning we did exercises about 'seven habits of a highly successful teenager'. Everyone loved it."

She's still wearing her space school T-shirt and a huge grin. "I would like to be an astrophysicist. *Gravity*, *The Martian* and *Apollo 13* are three of my favourite movies. I want to be the one who solves problems for astronauts," she says.

"The expedition is a once in a lifetime experience for the girls," says college principal Dr Anne Ireland.

"It aims to help them learn to set goals, self-motivate and gain personal and leadership development skills, while fuelling their interest in STEM-related careers and studies."

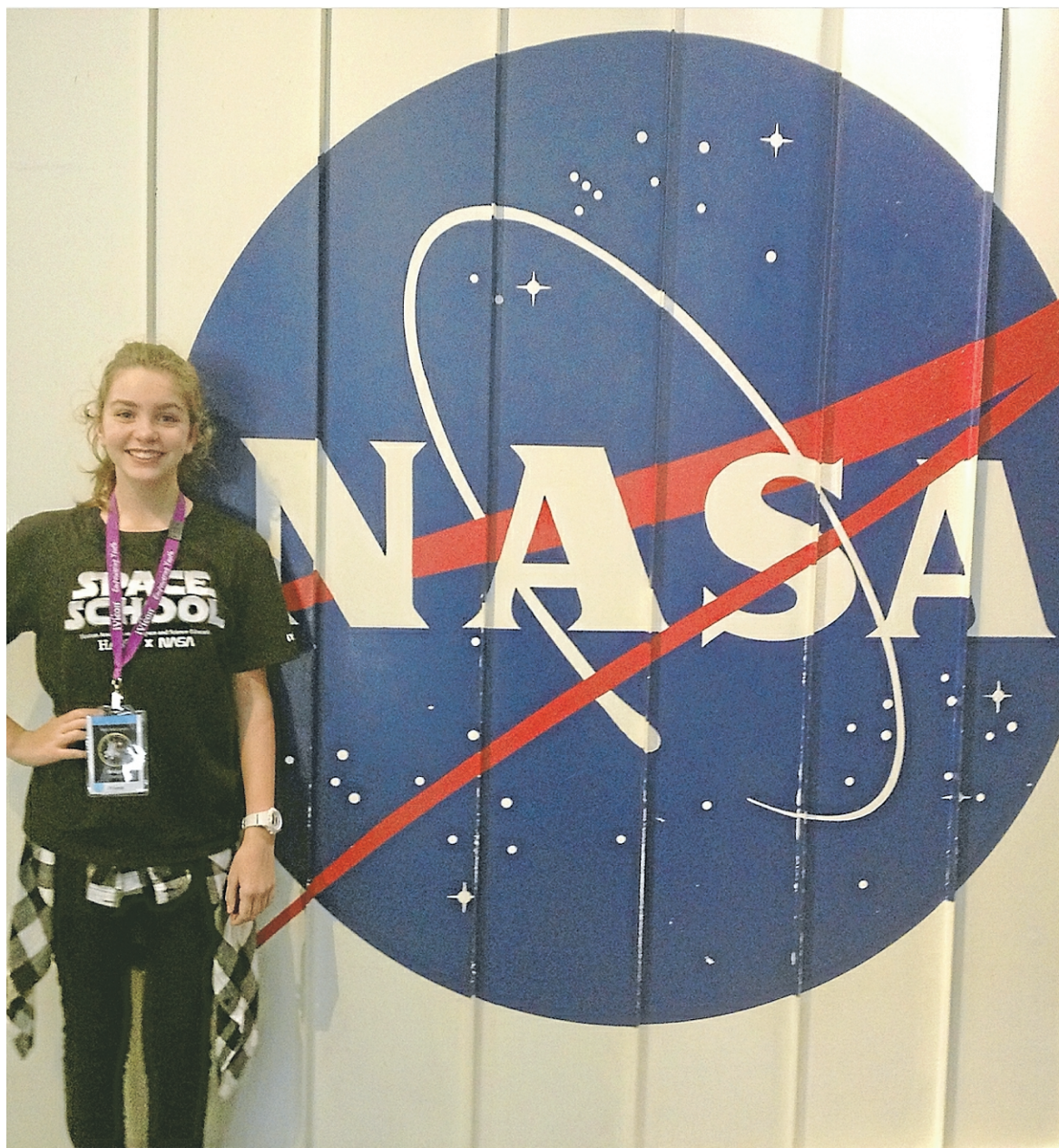
The Houston Association for Space and Science Education (HASSE) partners with NASA's Johnson Space Centre and the United States Space & Rocket Centre in Alabama.

It's STEM learning up close and is growing increasingly popular.

Bridget travelled with years 7-9 students from several independent schools but did not boldly go where no student has gone before.

Last year, Loreto Kirribilli student Laura Ferguson, 17, was part of a student cohort that took on the two-week mission.

"To actually be at NASA and see such extraordinary applications of science was simply the stuff of dreams," Laura says. "This sort of science is pushing the limits of human capacity. To see it first-hand was just out of this world – literally."



The telescope

The Global Jet Watch telescope, likely the largest privately owned telescope in Australia, operates at Tara Anglican School for Girls in collaboration with Oxford University.

The conference

Sydney will host the world's biggest gathering of space scientists in 2020. Known as the Space Olympics, the world assembly of the Committee on Space Research, or COSPAR, will convene at Darling Harbour's International Convention Centre.

Meantime, businessman Elon Musk's SpaceX program hopes to land humans on Mars by 2024; NASA and the European Space Agency are aiming for the late 2030s.

Marist Sisters' student Bridget Dwyer is still wearing her space school T-shirt – and a huge grin.

Classmate Lucinda Hogan, 16, was equally awestruck. "We met incredible people, including engineers and astronauts – and Leroy Chiao, a veteran of four space flights."

That's Chiao, PhD, a former International Space Station commander who has logged more than 229 days far away from Earth.

"Their extraordinary stories, lessons and passion were inspirational," Lucinda says. "We got to see the stuff we learn about in class channelled into insane outlets with very relevant uses. STEM has never looked so cool."

STEM is cool? Loreto Kirribilli careers adviser and science teacher

Natalie O'Keefe says the trip fostered a love of STEM and participating in NASA activities exposed students to careers they may not have previously thought of.

"Hearing from astronauts and space scientist and engineer Amber Gell had the greatest impact on the girls. Their inspiring stories about how they overcame set-backs was very powerful," O'Keefe says.

A group of Wenona School students last year also visited NASA centres as part of a US tour that included San Francisco's Exploratorium, Silicon Valley, Los Alamos National Laboratory, Hoover Dam and La Brea Tar Pits.

"They saw STEM in a completely

different light, in particular the interdisciplinary nature of STEM activity," says Wenona senior teacher Greg McArdle. It's an authentic way to learn, one which year 11 Wenona student Rebecca Karnani sees of benefit to girls.

"It was incredible to learn about the work NASA is doing, especially seeing the astronauts train in the Neutral Buoyancy Lab," she says. "The trip taught me that there are many specialties in STEM and the opportunities are endless. There is such a negative stigma around women in STEM and I think trips like these help break this."

The exponential evolution of technology means teachers are

preparing students for careers that don't yet exist. Whatever the jobs may be, it is likely they will rely on critical thinking and analytical skills. "The opportunities in these fields, particularly future-focused technologies to address global warming and to meet the needs of an ever-expanding population, will be areas of employment growth," says McArdle.

"Providing clean power, food and water in conjunction with driving future business areas will all require technological literacy. The exciting thing is that this will create an amazing array of design opportunities, drawing on all of the STEM disciplines."

Open Day

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