Aliena's co-founders George-Cristian Potrivitu (far left) and Mark Lim Jian Wei met while working on their PhDs at the Space Propulsion Centre in National Technological University. PHOTO: ALIENA

S'pore thruster on SpaceX nanosatellite

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Billionaire Elon Musk's company, SpaceX, deployed a nanosatellite into orbit early on Friday, taking with it a thruster designed and produced by a Singapore start-up.

The Hall thruster was from Aliena, a company started in 2018 by two students who met while working on their PhDs at the Space Propulsion Centre in National Technological University (NTU).

A thruster is used by satellites to make occasional firings to keep them in orbit, otherwise they would fall and re-enter Earth's atmosphere.

The nanosatellite was deployed into orbit from the SpaceX Falcon 9's Transporter-3 mission in Cape Canaveral Space Force Station, Florida.

Compared with current Hall thrusters that require around 1,000 watts to keep larger satellites in orbit and are unsuitable for smaller spacecraft, Aliena's engine can keep a nanosatellite operational with less than 10 watts of power, comparable to the energy needed to switch on a light bulb, according to the tech start-up.

Aliena's Hall effect thruster allows small satellites to move in space with less than 10 watts. PHOTO: ALIENA

The thruster also costs a fraction of larger ones in the market that can go up to US$2.2 million (S$2.9 million) each, said Dr Mark Lim Jian Wei, 33, co-founder and chief executive of Aliena.

He added that propulsion systems like the one Aliena develops are important to be able to actively manoeuvre satellites.

China last month submitted a note to the United Nations Office for Outer Space Affairs claiming that two SpaceX satellites had flown too close to the country's space station.

Dr Lim said: "Propulsion systems allow for collision avoidance to be executed in space. Without a propulsion system, if you know that there's a satellite going to approach you, the only thing you can do is to pray, right?"

Since forming Aliena in 2018 with co-founder and chief technology officer George-Cristian Potrivitu, 30, more than 20 people have worked on the thruster.

Mr Potrivitu said they were inspired to start the company to solve real world problems such as sustainability in space.

He said: "We saw how satellites were becoming more prevalent – especially miniature satellites – and there was a demand for propulsion systems that could enable sustainability in space and on ground.

"We can enable sustainability in space through giving satellites the ability to decommission themselves after their end of life, leaving behind a clean space for the generations to follow. And to also empower sustainability on Earth through the high resolution images that can be acquired to monitor and mitigate the effects of climate change"

Aliena has since secured separate orders from an undisclosed customer and has received interest from other enterprises for the use of its engines in their satellites.

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