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News Release

YOUNG INNOVATORS TACKLE REAL-WORLD CHALLENGES THROUGH THE YOUNG DEFENCE SCIENTISTS PROGRAMME

From navigating without GPS to powering operations in the battlefield, students stepped up to turn bold ideas into solutions through the Young Defence Scientists Programme (YDSP). Jointly organised by the Defence Science and Technology Agency (DSTA) and DSO National Laboratories (DSO), YDSP introduces students to technologies and their real-world applications in Singapore's defence and security. Held on 28 April 2026, the YDSP Congress marked the culmination of a year of research projects, mentorship and immersive learning experiences.

Over the course of YDSP, some 470 secondary and junior college students got to explore the exciting intersection of technology and defence. The programme saw students dive into emerging domains spanning artificial intelligence, robotics, unmanned systems, cybersecurity, quantum and more. They tackled real-world challenges and worked on plausible innovations. Students also learned from experienced defence engineers and research scientists, gaining first-hand insight into how scientific research and engineering innovation contribute to Singapore's national capabilities.

In his address to students, Senior Minister of State for Defence Mr Zaqy Mohamad emphasised the importance of nurturing young talent in defence science and technology, highlighting that sustaining Singapore's defence capabilities requires developing the next generation of innovators. He said: "The Young Defence Scientists Progamme was created with a simple but important goal: to expose bright young minds

to the rapidly evolving world of science and technology in defence. More than a programme, it reflects the long-standing commitment of DSTA and DSO to nurture the next generation of innovators, engineers and scientists who will contribute to Singapore's defence."

Under the Research@YDSP project attachment with DSTA, Arkin Talukdar from Anglo-Chinese School (Independent) and Bernice Chang from Victoria Junior College took on the challenge of drone interception. Working in simulation environments, they came across a research paper on augmented proportional navigation – a guidance technique designed to improve interception accuracy against accelerating targets – and asked an ambitious question: could the existing method be made more precise? Going beyond the brief, they modified the algorithm and designed their own tests, running over 100 simulations to evaluate performance across varying conditions. The result: concrete, tested insights that sharpen the picture for engineers working in this space.

"Through YDSP, I got to work on real defence problems that didn't come with clear answers," said Arkin. "What stood out most was being encouraged to push past the initial scope – to ask a harder question and then actually build the tests to answer it. My mentors didn't just hand me conclusions. They gave me the space to design the experiments, run the simulations, and work through the results. The programme puts you in an environment where the stakes are real, and the people are genuinely invested in helping you to overcome challenges. Being part of that shifts your sense of what's possible."

In their project with DSO, Jonathan Huang and Kabilan Ezhilarasan from NUS High School of Math and Science developed an advanced approach to navigation that could one day function where GPS fails. By using specially engineered diamonds that react to magnetic forces, they built a prototype sensor that 'reads' magnetic fields through changes in light. More significantly, their work challenged a prevailing assumption in the field: that such diamonds could only measure the strength of a magnetic field. Their results demonstrated that these sensors could also be used to measure its direction. This opens a potential path toward more sensitive and compact magnetic navigation systems for defence applications.

“Guided by our DSO mentors, we learnt to apply theoretical knowledge to real-world experimental physics,” said Jonathan and Kabilan. “Our time with YDSP has been a highly rewarding journey, taking us from theoretically modelling a quantum magnetometer to designing, constructing and optimising such a magnetometer in practice. We are incredibly grateful for the mentorship and the platform YDSP provided, which showed us how student-led research can contribute meaningfully to the future of science and national security. We are also extremely grateful for our mentors and their colleagues, who were very supportive and made this experience a fun and meaningful one.”

During the congress, Mr Zaqy presented 30 YDSP Scholarships and 35 DSTA Junior College Scholarships to students who demonstrated strong academic performance and a keen interest in science and technology.

Since its establishment in 1992, YDSP has introduced thousands of students to the possibilities of defence science and engineering. Many alumni have gone on to pursue STEM studies and careers, contributing to Singapore’s defence technology ecosystem.

[For detailed information about YDSP, please refer to the YDSP Fact Sheet.]

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About Defence Science and Technology Agency

The Defence Science and Technology Agency (DSTA) is a leading technology organisation that drives innovation and delivers state-of-the-art capabilities to make the Singapore Armed Forces a formidable fighting force. Harnessing and exploiting science and technology, our engineers and IT professionals leverage multidisciplinary expertise to equip our soldiers with advanced systems to defend Singapore. DSTA also contributes its technological expertise to support national-level developments. To achieve our mission, DSTA excels in systems engineering, digitalised platforms, cyber, software development and more.

Visit www.dsta.gov.sg for more information.

About DSO National Laboratories

DSO National Laboratories (DSO) is Singapore's national defence research and development organisation. For the past 5 decades, DSO has been undertaking indigenous development of advanced defence and weapon systems that provide the Singapore Armed Forces (SAF) with the superior technological edge in the battlefield. While its primary focus is to support the SAF, DSO also extends its defence R&D capabilities to support homeland security. With more than 1,600 research scientists and engineers, DSO investigates emerging technologies, matures promising ones and integrates them into innovative system concepts to meet Singapore's defence and security needs.

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