



The Taipei Aerospace & Defense Technology Exhibition (TADTE) 2023 Ended on a High Note: Three Teams from NYCU Showcase Multiple Rocket Systems that Attracted Significant Attention

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Three Teams from NYCU Showcase Multiple Rocket Systems (Photo from ARRC)

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The Taipei International Aerospace and Defense Exhibition came to a successful conclusion on the 16th at the Nangang Exhibition Center. After a four-year hiatus, this exhibition, organized by the Taiwan External Trade Development Council (TAITRA), achieved its largest exhibition scale since its inception 16 years ago. Over the course of the three-day event attracted more than 30,000 visitors.

The Advanced Rocket Research Center (ARRC) at National Yang Ming Chiao Tung University (NYCU), along with the Aerospace Systems and Aerodynamics Research (ASARe) Lab led by Assistant Professor Zu Puayen Tan, and Formosan Fox Rocketry Team from NYCU's students, were featured in the "Taiwan Space Gallery," organized by the Taiwan Space Agency (TASA).

The ARRC presented static exhibit which including custom-made thrust control valves, latch control valves, and rocket avionics systems. They also unveiled the world's first hybrid rocket with hover flight capability, the HTTP-3AT rocket. Additionally, the exhibition marked the debut of the HTTP-4 vertical takeoff and vertical landing hybrid rocket, featuring dynamic demonstrations of TVC (Thrust Vector Control) technology during the event.

The HTTP-4 rocket is set to undergo flight testing in the near future to verify its vertical takeoff and vertical landing (VTVL) flight control technology, which is expected to serve as a cornerstone for future rocket recovery efforts in Taiwan. However, the highlight of the exhibition was the HTTP-3A two-stage hybrid rocket, measuring approximately 9 meters in length. It was designed as a prototype for future satellite launch vehicles and successfully launched its second stage in July of last year. Plans are underway for the full launch of the HTTP-3A rocket next year.

ASARe Lab and Formosan Fox presented their groundbreaking projects at the exhibition, including the Formosan Fox-1 rocket, representing Taiwan for the first time in the world's largest student rocket competition in 2022 (the retrieval of rocket's body after competition). They also exhibited "Asfaloth," a rocket set to undergo its maiden launch by the end of this year, along with its payload, "AsyncELF."

Asfaloth measures approximately 6 meters in length and weighs around 250 kilograms. It is a collaboration between ASARe Lab, ARRC, and the Taiwan Space Agency (TASA), aimed at developing a small-scale supersonic sounding rocket system. AsyncELF, on the other hand, is a joint project by ASARe Lab and the United States Air Force Office of Scientific Research, focused on hypersonic technology.

The development of these rockets and payloads contributes to the establishment of a unique vertical technology development chain at National Yang Ming Chiao Tung University. This chain is underpinned by Autodesk software and the core expertise of NYCU's Institute of Space Systems Engineering (ISSE).



Team photo of Aerospace Systems and Aerodynamics Research (ASARe) Lab which led by Assistant Professor Zu Puayen Tan, NYCU. (Photo from ARRC)