



NTU and Singfilm Solar send perovskite solar cells to space aboard CRIMSON-1 satellite

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Nanyang Technological University (NTU Singapore) has launched CRIMSON-1, a nanosatellite carrying perovskite solar cells developed together with NUS spin-off [Singfilm Solar](#), marking the first time a Singapore-made perovskite solar module has flown in orbit. The satellite lifted off on October 1 aboard a SpaceX Falcon 9 rocket as part of the Transporter-18 rideshare mission from Vandenberg Space Force Base, California, and was deployed about 520 km above Earth using Exolaunch's EXOpod Nova system.



The team from NTU Satellite Research Centre and their partners. Image credit: NTU

CRIMSON-1 is NTU's 14th research satellite, built by the university's Satellite Research Centre (SaRC). The 5 kg, shoebox-sized spacecraft is designed to run a year-long mission testing two technologies under real orbital conditions: the perovskite solar cells, and an onboard AI system that filters and analyzes satellite imagery before transmitting it to Earth, cutting down on the raw data scientists would otherwise need to process manually.



thinner, lighter and have the potential to be manufactured far more cheaply, which is the core appeal for future satellite designs.

"This mission marks the first spaceflight of a flexible perovskite solar module built on ultrathin glass, and the first deployment of a Singapore-made solar module in orbit," said Hou Yi, Assistant Professor at NUS and founder of Singfilm Solar. NTU Deputy President Professor Christian Wolfrum added that "CRIMSON-1 carries next-generation perovskite solar cells and edge AI computing into orbit. These technologies can only be validated under real space conditions."

CRIMSON-1 is backed by Singapore's National Space Agency (NSAS) under its Space Access Programme, part of the national Space Technology Development Programme, which has allocated S\$210 million (about US\$157 million) to space technology R&D since 2022. The Infocomm Media Development Authority secured the satellite's spectrum and orbital resources through the UN's International Telecommunication Union. "Perovskite solar cells will provide a compelling advantage over conventional panels - their thin, lightweight properties make them particularly well suited for space applications, where every gram matters," said Ngiam Le Na, NSAS's chief executive.



NTU has previously flown perovskite cells in space on its ARCADE satellite in 2023, as part of a broader slate of space projects under Singapore's Space Technology Program. Singfilm Solar, which spun out of NUS, reported a record 22.6% power conversion efficiency for a perovskite solar panel in 2024.

Source: www.eurekalert.org

Tags: Flexibility Space Perovskite Solar