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ABB and Nüvü exoplanet camera readout system for NASA flagship telescope launched into orbit

- NASA's Nancy Grace Roman Space Telescope is equipped with high-precision imaging camera electronics developed by ABB and Nüvü Camēras
- The ultra-sensitive camera readout system enables NASA to study planets beyond our solar system, helping advance the search for other worlds
- The Roman mission will pave the way for NASA's Habitable World Observatory, a future mission concept to identify potentially habitable planets

The Nancy Grace Roman Space Telescope, NASA's infrared observatory launched on August 30, 2026, will help scientists study planets beyond our solar system using ultra-sensitive camera electronics developed and manufactured by ABB and Nüvü Camēras. The cameras form part of the Roman Coronagraph Instrument designed to test new technologies for exoplanet research and help pave the way for NASA's Habitable Worlds Observatory, a future mission concept that would aim to search for signs of habitability on other planets.

The Roman Coronagraph Instrument is expected to be 100 to 1000 times more powerful for imaging exoplanets than what is achieved by other space-based coronagraphs today. Named after NASA's first chief of astronomy, also known as the "mother of Hubble", the Nancy Grace Roman Space Telescope features a field of view 100 times larger than the Hubble Space Telescope, allowing it to survey a significantly larger portion of the sky in a single observation.

Drawing on expertise from 30 years of space projects and more than 140 optical systems operating in orbit, ABB engineers compressed the camera readout system into a compact unit no larger than a shoe box. Built with electronic cores made from space-qualified components, the camera electronics are designed to withstand the harsh radiation environment of deep space and cryogenic temperatures while capturing extremely faint light from planets orbiting distant stars.

Because exoplanets are vastly dimmer than the stars they orbit, the Roman Coronagraph uses advanced optics to suppress starlight and direct the faint reflected light from nearby planets to the ultra-sensitive cameras.

The telescope will operate at the Lagrange point L2, a special location in our solar system where the Earth and Sun always appear close to one another, allowing to block light pollution from both. At roughly four times the distance between Earth and the Moon, the observatory will be beyond reach of servicing missions such as those carried out for the Hubble Space Telescope, making the reliability and robustness of onboard systems critical.

“Projects like the Roman mission demonstrate what is possible when scientific ambition and engineering innovation come together,” said Marc Corriveau, General Manager of ABB’s Measurement & Analytics division in Canada. “We are proud that technology developed by our space team in Quebec will contribute to this landmark NASA mission and support discoveries that could reshape our understanding of the universe.”

In 2020, NASA’s Jet Propulsion Laboratory awarded ABB the contract for the exoplanet camera readout system, building on imaging technology developed together with Nüvü Camēras and supported by the Canadian Space Agency’s technology development programs. In addition to NASA, ABB has contributed optical technologies to missions by the Canadian Space Agency, the European Space Agency and the Japanese Space Agency, as well as to space projects by commercial satellite operators such as GHGSat, EarthDaily and Hydrosat.

“Working closely with ABB, we combined our expertise to provide the imaging technology that will enable one of NASA’s most ambitious exoplanet imaging missions to date, paving the way to answering one of humanity’s biggest questions: are we alone in the universe?” said Olivier Daigle, Chief Technology Officer at Montréal-based Nüvü Camēras. “We are grateful to the Canadian Space Agency for helping us validate this technology for direct exoplanet-imaging applications and for supporting the advances that led to its selection by NASA’s Jet Propulsion Laboratory.”

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