NEWS RELEASE

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For Immediate Release

Princeton Infrared Technologies Awarded NASA SBIR Contract to Develop Next-Generation 24-bit SWIR Imager

MONMOUTH JUNCTION, NJ – DECEMBER 4, 2024 – Princeton Infrared Technologies, Inc. (PIRT), global leaders in indium gallium arsenide (InGaAs) imaging technology, announces that it has been selected by NASA for a Phase I SBIR contract to develop an advanced shortwave infrared (SWIR) imager. This innovative imager features a 640x512 resolution array with detection from 400 to 3000nm and an unprecedented 24-bit linear high dynamic range (HDR), establishing a new standard in infrared imaging.

This project, managed by NASA's Jet Propulsion Laboratory (JPL), is a material technology development effort focused on creating lower-cost, highly sensitive imagers that cover a wide spectral range – from visible through the entire SWIR wavelength band with less cooling for hyperspectral imaging. These advanced imagers will enable the detection of a wide variety of chemical signatures for atmospheric sensing with reduced size, weight, and power (SWaP).

The proposed SWIR imager will operate within the 400 to 3000nm wavelength range. Leveraging 100mm GaSb substrates and using molecular beam epitaxy (MBE) will enable lower costs than traditional materials like HgCdTe and InSb. The materials will also reduce the need for cooling, and therefore the overall SWaP-C.

A unique feature of this imager is its 24-bit dynamic range, which no other SWIR system currently offers. This extraordinary range allows it to detect and distinguish between the brightest and faintest signals in the scene. This is an essential capability for atmospheric sensing, where chemical species like carbon dioxide, oxygen and methane must be detected under varying lighting conditions. By providing this wide dynamic range, PIRT's

imager will facilitate the detection of a broad array of substances at various concentration levels with superior precision, addressing NASA's requirements for future missions.

The new imager is designed to be integrated into a camera with less than 275 electrons of read noise, capable of processing over 250 frames per second (fps) at full resolution and bit depth. The camera will also feature a common commercial output interface making it easy to integrate into various platforms and applications.

Beyond space exploration, PIRT's new imager is expected to have broad impact on commercial applications, including plastics sorting in recycling processes, methane detection for pipeline inspections and factory emissions, pharmaceutical process control, blood glucose monitoring and mineral identification. The ability to detect materials with spectroscopic signatures in the extended SWIR range will provide industries with a powerful new tool for advanced material identification.

"We are thrilled to receive this SBIR contract and are eager to advance our SWIR imager technology," said Martin H. Ettenberg, CTO and Founder at Princeton Infrared Technologies. "With 24-bit dynamic range, lower SWaP and lower dark current, we are creating a high-sensitivity imager that delivers unmatched performance. This technology not only addresses the needs of NASA but also opens up new opportunities across a range of commercial sectors."

About Princeton Infrared Technologies, Inc.
Specialists in indium gallium arsenide (InGaAs) imaging technology, Princeton Infrared Technologies, Inc. focuses on design and manufacture of both shortwave infrared cameras, and one- and two-dimensional imaging arrays. All products are created in the company's fabless environment under strict testing and quality control guidelines, providing innovative and cost-effective detectors that image in the visible, near- and shortwave-infrared wavelengths. Application areas include spectroscopy for sorting materials, moisture detection, thermal imaging, night vision, and laser imaging for military, industrial, and commercial markets.

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