Boeing Provides The 'Eyes' For The Latest Astronomical Discoveries

Fomalhaut, Beta Pictoris, Vega and HR 4796A could be names in a science fiction novel, but they actually represent just a few of the brightest stars in our night sky.

They are also at the center of astronomers' latest discovery, which reflects the clearest evidence to date of budding planets in a solar system around a nearby star. Since the astronomers can't see the phenomenon happening before their eyes, they rely on high-technology "eyes" to do the job for them -- "eyes" developed and manufactured by The Boeing Company.

Specifically, two NASA teams that made the discovery used mid-infrared instruments equipped with Boeing 128x128 detector Blocked-Impurity-Band (BIB) arrays. The arrays were invented and produced at the Boeing Research and Technology Center in Anaheim, Calif. The center is part of the company's Electronic Systems & Missile Defense business segment.

"The Boeing detectors can be considered both the heart and the eyes of the instruments used to see these stars and the surrounding evidence of planetary formations," said Charles Telesco, professor of astronomy at the University of Florida, and leader of one of the discovery teams. "What before would only have been defined as blobs now appears in detail, allowing us to make these observations."

Each array, only one square centimeter in size, contains 16,384 detectors. By measuring the amount of light captured by each detector, the array produces a detailed image. The Boeing arrays used in the cameras were optimized to accommodate the high background-radiation levels encountered in ground-based infrared imaging and to provide sensitivity at infrared wavelengths out to approximately 26 micrometers (or 0.0026 cm -- the human eye is sensitive to radiation within the range of 0.00004 to 0.00007 cm).

"Our scientists and engineers have invested their hearts and souls in advancing the state of imaging technology for a variety of uses," said Robert D. Paster, vice president and general manager of Boeing Electronic Systems and Missile Defense. "It is a continual source of pride for all of us to see the technology lead to such amazing observations."

Continued development of BIB detectors by Boeing has led to sensitive arrays for infrared wavelengths as long as 40 micrometers. Additionally, the company is developing a 256x256-pixel BIB array with more than 65,000 detectors that will improve the resolution of mid-infrared instruments for astronomy, paving the way for startling discoveries yet to come.

BIB detector technology and its spin-offs have been used in a wide range of applications, including defense, space- and ground-based astronomy, nuclear particle tracking, hyperspectral imaging (reconnaissance), plasma diagnostics and medical imaging.

Electronic Systems & Missile Defense, part of the Information & Communications Systems business unit of Boeing, provides products and services to customers in its addressed markets of strategic missiles, missile defense systems, marine system products, as well as electronics products and sensor systems for global defense and commercial markets.

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