NANOWAVE Technologies delivers state-of-the-art cryogenic low noise amplifiers the National Research Council Canada for SKA Observatory

The National Research Council of Canada (NRC) is responsible for supplying the full complement of Band 2 low noise amplifiers for SKA-Mid.

Astronomical signals received by the SKA Observatory's (SKAO's) antennas are extremely faint, meaning the signals must be highly amplified but without introducing unwanted noise from the system itself. To perform this critical function, the SKAO requires state-of-the-art low noise amplifiers (LNAs).

The NRC represents Canada in the governance of the SKAO, the world's next-generation radio-astronomy observatory.

One of the NRC's contributions to the project is to supply hundreds of cryogenic low noise amplifiers—LNAs that operate at extremely low temperatures to minimize thermal noise.

"The biggest challenge was to achieve ultra-low noise," explains Frank Jiang, a senior researcher at the NRC who led development of the LNA. "The LNAs add less than 2 kelvin of noise across the entire operating band, which is a record low while also maintaining high gain stability. This is critical for correct calibration of astronomical observations at cryogenic temperatures."

The NRC produced the first batch of 20 LNAs in their research lab at the Dominion Astrophysical Observatory in Victoria, British Columbia. However, this is only a small fraction of the cryogenic LNAs needed for the SKA-Mid. The NRC outsourced the remainder to NANOWAVE Technologies who are well suited to produce them at high volume while maintaining their superb noise and stability characteristics.

Working together since 1997, the NRC and NANOWAVE Technologies also produced the cryogenic LNAs for the Atacama Large Millimeter/submillimeter Array (ALMA), in Chile, as well as for the SKA precursor MeerKAT radio telescope in South Africa.

About NANOWAVE Technologies Inc.

NANOWAVE Technologies Inc. is an ISO 9001:2015 and AS 9100D certified design and manufacturing company headquartered in Toronto, Canada, with facilities in the United States and France. The company specializes in delivering reliability multi-function assemblies to the space, aerospace, defense markets. Functionalities include RF, EPC, Embedded Software, Monitoring and Control functions.

The company meets performance, quality and schedule commitments using the combination of deep design expertise supported by a high level of vertically integrated manufacturing.

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