

## Low Noise Amplifiers for microwave radio astronomy array in South Africa

Technology developed in the GHz Centre project Integrated TeraHertz Systems (ITHZS) has been used by Low Noise Factory AB in Sweden's contribution by Onsala Space Observatory (OSO) to Square Kilometer Array (SKA) in South Africa, the MeerKAT telescope.

The InP HEMT technology originally developed at Chalmers has been used by LNF to design low-frequency LNAs for the Band 1 receiver in the MeerKAT telescope. The full receiver prototype has been developed by OSO. LNF has been in collaboration with OSO to manufacture the receiver using the specially designed LNAs from LNF to work at room-temperature covering 0.35-1.05 GHz.

The InP HEMT technology used in the LNAs and developed between Chalmers and LNF in GHz Centre offers a substantial improvement in noise and gain compared to other technologies. As a result, the design of the telescope array can be made with less footprint and cost.

The Director of OSO has called the LNAs from LNF "a major success story". LNF is now listed by *Big Science Sweden* as a "High-tech Swedish supplier to Big Science".

*Press release Chalmers (2018):*

<https://www.chalmers.se/en/researchinfrastructure/oso/news/Pages/Swedish-receiver-to-capture-cosmic-waves-in-the-worlds-largest-radio-telescope.aspx>

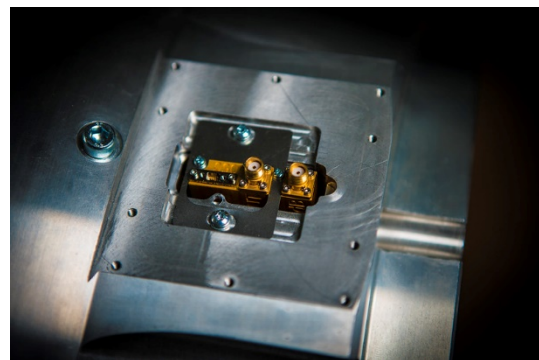
*Publications:*

J. Schlee et al., *10 K Room Temperature LNA for SKA Band 1*, IEEE MTT-S International Microwave Symposium Digest (2016).

J. Schlee et al., *Cryogenic LNAs for SKA Band 2 to 5*, IEEE MTT-S International Microwave Symposium Digest (2017).



*MeerKAT antenna with receiver containing LNAs from LNF. Courtesy of Onsala Space Observatory.*



*LNAs from LNF in the Band 1 receiver. Courtesy of Onsala Space Observatory.*