Ultra Low Noise
Transistors & Circuits

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**Products**

**Discrete InP HEMTs**

- based on decades of research at ETH Zurich
- better performance than GaAs mHEMT
- field proven: ESA, Yebes Observatory, ...

**InP HEMT based circuits**

- currently in prototyping / 0-series phase
- expected to be available as regular product in 2020
Products

- usually used in LNA modules
- integrated circuits can also be directly built into more complex systems
LNA benefits

Low Noise Amplifiers Allow

- Higher Data Rates
- Detection of Weaker Signals
- Decoding of Noisier Signals

Examples:
- replacing the existing LNAs in the ESA ground-stations allows for up to 60% increase in data received from space missions
- elimination of the need for cryogenic cooling of receivers
Examples

Cryogenic LNA Modules

![Graph 1: C-band amplifier with $T_{amb} = 13.7$ K](image1)

![Graph 2: K-band amplifier with $T_{amb} = 18$ K](image2)
Examples

Room Temperature LNA Module

![Graph showing noise performance at 1.4 GHz for a LNA module. The graph plots noise figure (dB) and gain (dB) against temperature (Celsius). The noise figure starts at around 0.10 and increases slightly with temperature, while the gain remains constant at around 20 dB.]