Terahertz Technology
- Limitations
  - Poor sensitivity of devices
  - Weak-power sources
- Opportunities
  - Bandwidth: only abundant resource in THz field!

Our Speciality
- Typical broadband antennas:
  - Phase Center Movement
  - Radiation Dispersion

Actual need:
- Antenna with stable phase center
- Antenna distribution that scales with frequency

We solved the problem
Leaky Lens Radiation (10 years of research)
- Freak Radiation Mechanism
  - Emerging from one point independently from frequency!!!
  - Only non dispersive radiation mechanisms known!

Department strategy
- MMIC-based
  - mm-wave THz spectroscopy
  - The use of combined optical and electronics can allow the realization of truly broad-band systems with high sensitivity and narrow line detection

Objective 1: Optically-pumped power generation

Objective 2: Space-science instruments

Objective 3: THZ camera in CMOS

Present Research
- Biggest Present Funding
  - Advanced Antenna Architectures for THZ Sensing Instruments
    - Starting Grant from European Research Council
    - Mission: Introduce breakthrough Antenna Technology to revolutionize Broad Band THz imaging

Holy Grail is Tera-bit communications
- Wireless internet a million time faster than now...
- ...by exploiting the entire THz spectrum

Support to
- Cryogenically cooled receivers
  - Antennas for Kinetic Inductance Detectors
  - Integrated receivers at 670 GHz with extreme sensitivity

Terahertz sensing group (started on 1st Jan. 2012)
- Prof. A. Neto
- UHD I. Lager
- UD N. Liombart
- Postdoc D. Cavallo
- 2 PhD (budget available for 3 more)
- 3 Visiting Postdocs
- 1 visiting professor