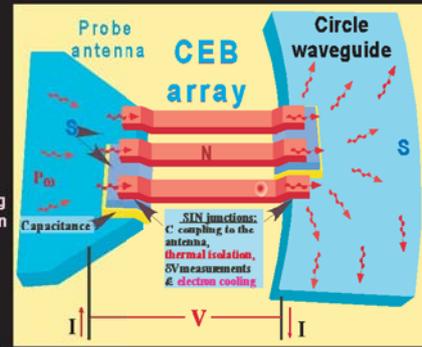
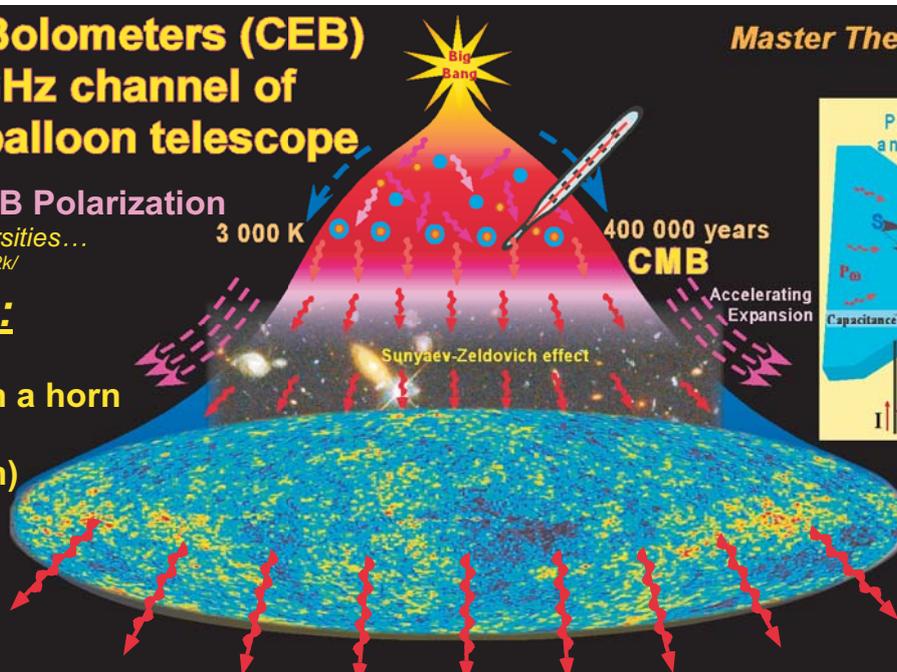


# Cold-Electron Bolometers (CEB) for the 350 GHz channel of BOOMERANG balloon telescope

Measurements of CMB Polarization  
Rome, Oxford, Cardiff Universities...  
<http://oberon.roma1.infn.it/boomerang/b2k/>

## Chalmers Tasks:

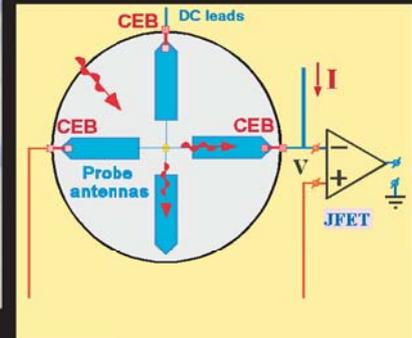
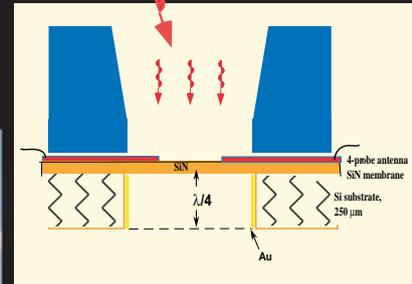
- 350 GHz, 45 CEBs, circle waveguide with a horn (4 probe antenna, polarization detection)  
Chalmers group - the only provider!



Each probe is connected to a series CEB array for DC and to a parallel array for HF (schematically shown as a single CEB in the bottom figure). Connection in parallel for HF signal is realized by special capacitances between superconducting islands and antenna.

13.7 billion years

Antarctica; BOOMERANG-2 launch



## Milestones:

- The Nobel Prize in Physics 1978: Discovery of Cosmic Microwave Background Radiation
- Science. Breakthrough of the Year 1998: Cosmic Motion Revealed
- Shocking news: Acceleration of the Universe
- 4% - ordinary matter 96% - dark energy and dark matter

Science. Breakthrough of the Year 2003: Illuminating the Dark Universe (BOOMERANG, WMAP, SDSS)

The Nobel Prize in Physics 2006: Anisotropy of the Cosmic Microwave Background Radiation (COBE satellite launched in 1989)

Breakthrough of the Year ???: dark energy -? dark matter -? gravitational waves -? accelerating Universe -? (BOOMERANG-? CLOVER-?, OLIMPO-?, B-Pol-?...)

Master Thesis will include:

- Fabrication of CEB nanobolometers using MC2 clean-room facilities
- DC and RF tests using cryogen-free refrigerators of Oxford Instruments
- Comparison with theoretical models
- HFSS simulation of RF part
- Final RF tests in Oxford and Rome Universities (balloon projects BOOMERANG & OLIMPO)

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