Italian Community Update

Nicola Vittorio

On behalf of the Italian CMB community

CMB Funding Agencies

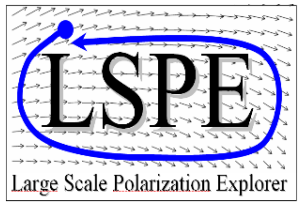
- Italian Space Agency
- National Institute for Nuclear Physics
- Antarctic National Program (PNRA)
- National Institution for Astronomy and Astrophysics (INAF)

Already financed projects

- **R&D**
  - New generation of detectors and polarimeters (ASI,INFN)
    - Array of TES Antenna Coupled Bolometers
    - High Multiplicity FDM
    - See F.Gatti talk
- **Balloon-borne experiments**
  - Olimpo (ASI)
    - 1st launch opportunity from Svalbard (78°N) in Summer 2018
  - LSPE/SWIPE (ASI, INFN)
    - 1st launch opportunity from Svalbard (78°N) in Winter 2018/19
- **Ground-based experiments**
  - LSPE/STRIP (ASI,INFN)
    - start of data taking in 2018
  - QUBIC (INFN)
  - COSMO experiment @ Dome C (PNRA)

OLIMPO

- **The OLIMPO experiment is a first attempt at spectroscopic measurements of CMB anisotropy.**
- **A large balloon-borne telescope with a 4-bands photometric array and a plug-in room temperature spectrometer**
- **see http://planck.roma1.infn.it/olimpo for a collaborators list and full details on the mission**
- **Main scientific targets:**
  - **SZ effect in clusters –> unbiased estimates of cluster parameters**
  - **Spectrum of CMB anisotropy –> anisotropic spectral distortions**



LSPE

the Large-Scale Polarization Explorer

Paolo de Bernardis,
Università La Sapienza, Roma, Italy
for the LSPE collaboration

Peter	Ade	University of Cardiff
Giorgio	Amico	Dip. Fisica Sapienza & INFN Roma1
Alessandro	Baldini	INFN Pisa
Paola	Battaglia	Dip. Fisica Università di Milano
Elia Stefano	Battistelli	Dip. Fisica Sapienza & INFN Roma1
Alessandro	Baù	Dip. Fisica Università di Milano Bicocca
Carlo	Bemporad	INFN Pisa
Marco	Bersanelli	Dip. Fisica Università di Milano
Michele	Biasotti	Dip. Fisica Uni. Genova & INFN Genova
Andrea	Boscaleri	IFAC - CNR Firenze
Alessandro	Buzzelli	Università di Roma TorVergata & INFN Roma2
Paola	Cabella	Università di Roma TorVergata & INFN Roma2
Francesca	Cavaliere	Dip. Fisica Università di Milano
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Eugenia	Caccia	Dip. Fisica Tor Vergata & INFN Roma2
Gabriele	Coppi	Dip. Fisica Sapienza & INFN Roma1
Alessandro	Coppolecchia	Dip. Fisica Sapienza & INFN Roma1
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Angelo	Cruciani	Dip. Fisica Sapienza & INFN Roma1
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Giancarlo	De Gasperis	Università di Roma TorVergata & INFN Roma2
Matteo	De Gerone	Dip. Fisica Uni. Genova & INFN Genova
Marco	De Petris	Dip. Fisica Sapienza & INFN Roma1
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Flavia	Fontanelli	Dip. Fisica Uni. Genova & INFN Genova
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Christian	Franceschet	Dip. Fisica Università di Milano
Luca	Galli	INFN Pisa
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Anna	Gregorio	Department of Physics - University of Trieste
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Alessandro	Gruppuso	INAF/IASF Bologna & INFN Bologna
Riccardo	Gualtieri	Dip. Fisica Sapienza & INFN Roma1
Victor	Haynes	University of Manchester
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Massimiliano	Lattanzi	Università di Ferrara & INFN Ferrara
Bruno	Maffei	University of Manchester
Davide	Maino	Dip. Fisica Università di Milano
Tommaso	Marchetti	Dip. Fisica Sapienza & INFN Roma1
Silvia	Mari	Dip. Fisica Sapienza & INFN Roma1
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Giampaolo	Pisano	University of Cardiff
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Maura	Sandri	INAF - IASF Bologna
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Giovanni	Signorelli	INFN Pisa
Franco	Spinella	INFN Pisa
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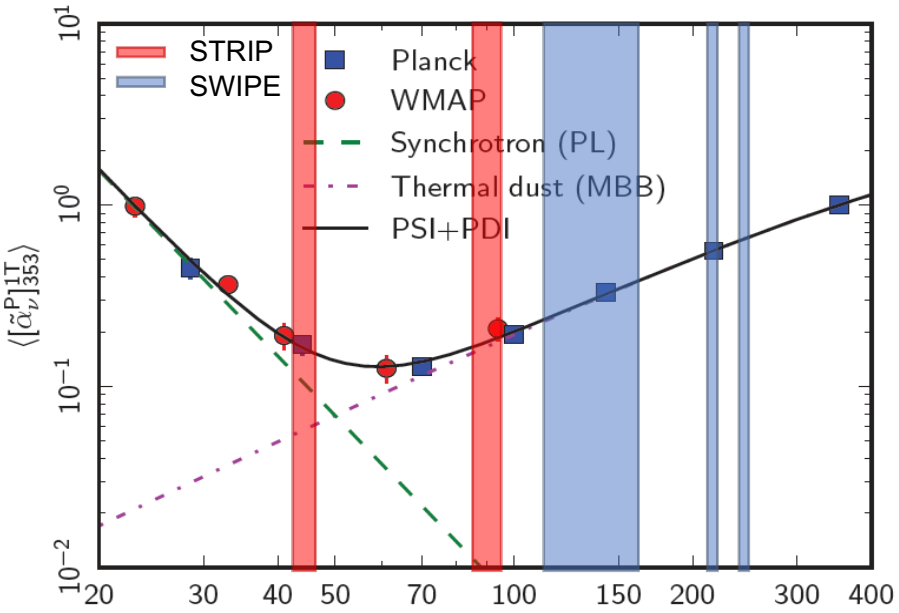
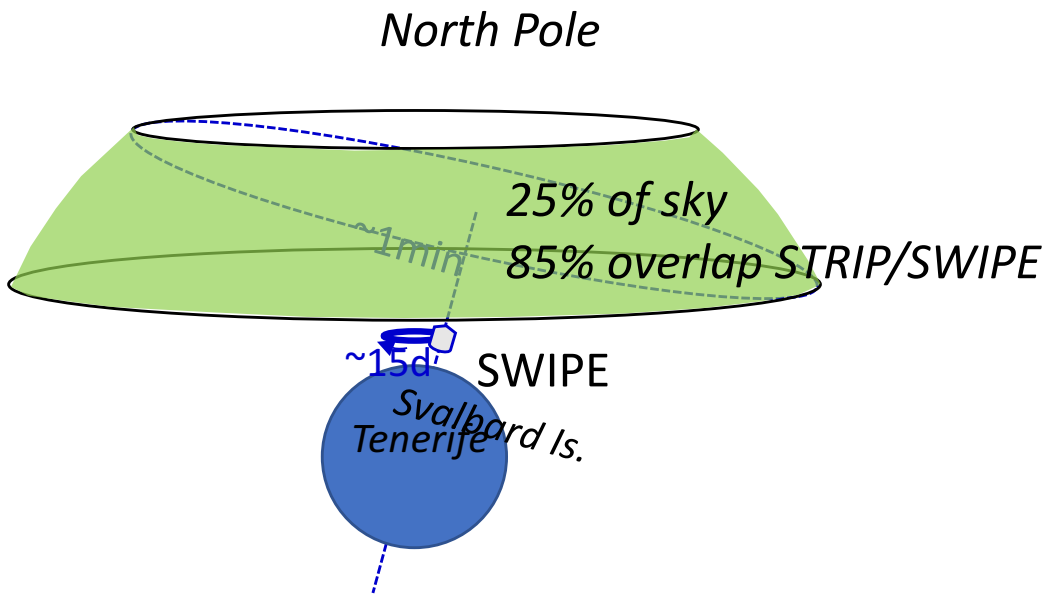
Riccardo	Tascone	IEIIT - CNR - Torino
Luca	Terenzi	INAF - IASF Bologna
Maurizio	Tomasi	Dip. Fisica Università di Milano
Elisabetta	Tommasi	Italian Space Agency
Carole	Tucker	University of Cardiff
Fabrizio	Villa	INAF - IASF Bologna
Giuseppe	Virone	IEIIT - CNR - Torino
Nicola	Vittorio	Università di Roma TorVergata & INFN Roma2
Andrea	Zacchei	INAF Osservatorio Trieste
Maria	Zannoni	Dip. Fisica Università di Milano Bicocca
Guido	Zavattini	Università di Ferrara & INFN Ferrara

LSPE

Combining ground-based (STRIP) and balloon (SWIPE) instruments





44 GHz
Monitor polarized synchrotron

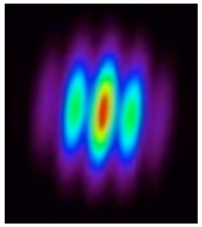
90 + 140 GHz
Main CMB channels

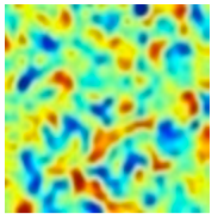
220 + 240 GHz
Monitor level **and slope and rotation** of polarized dust emission

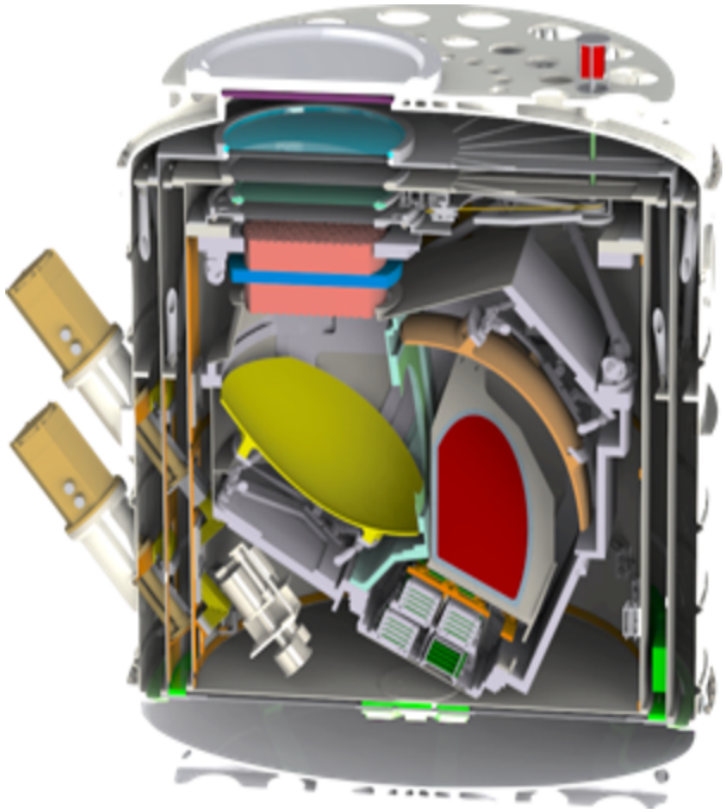
To date extrapolated from 350 GHz only

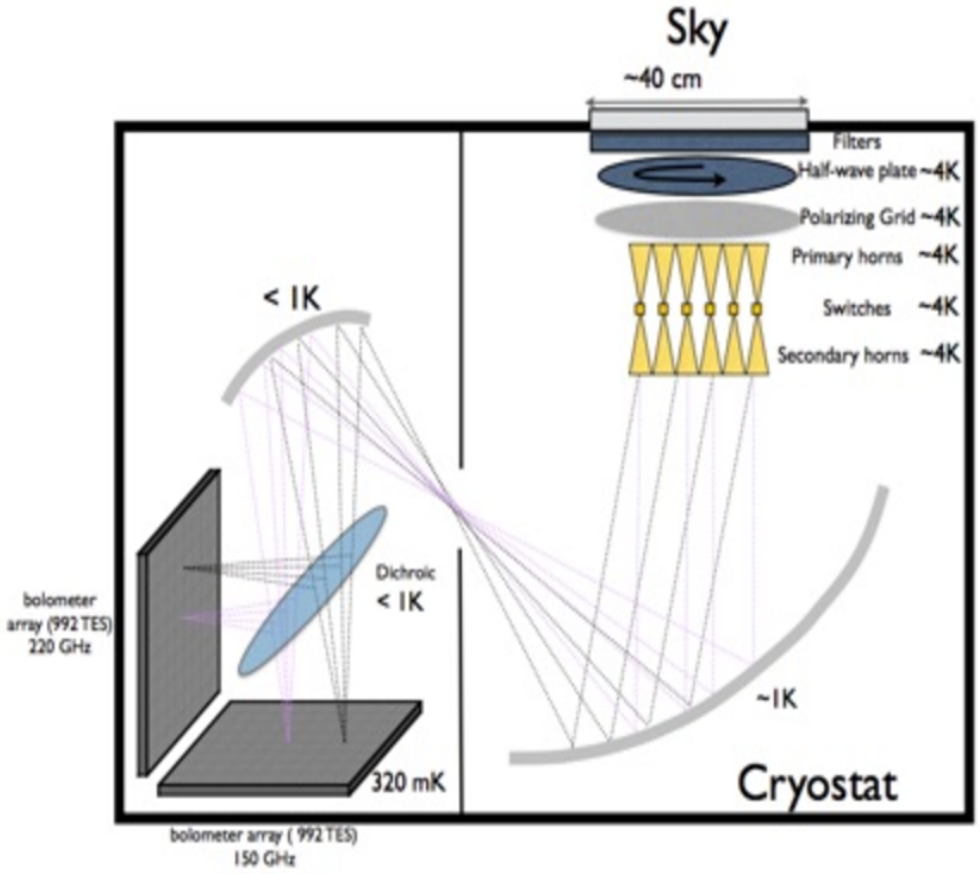
QUBIC

a Q&U Bolometric Interferometer for Cosmology



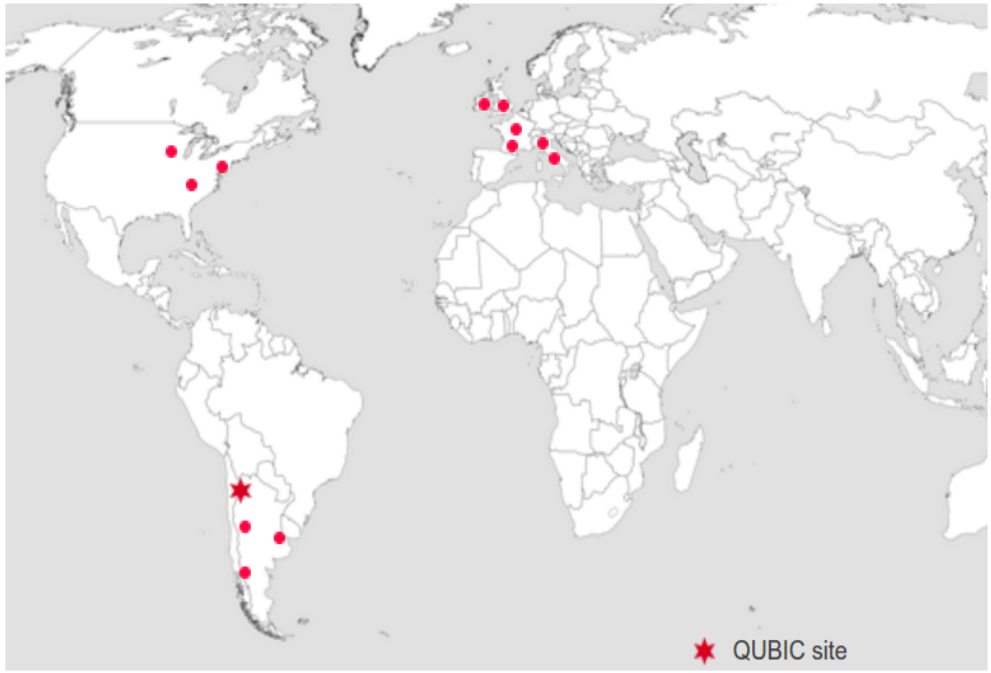






QUBIC
Collaboration and funding agencies

APC Paris, France
CSNSM Orsay, France
IAS Orsay, France
IEF Orsay, France
IRAP Toulouse, France
LAL Orsay, France
Universita di Milano-Bicocca, Italy
Universita degli studi di Milano, Italy
Universita La Sapienza, Roma, Italy
Maynooth University, Ireland
Cardiff University, UK
University of Manchester, UK
Brown University, USA
Richmond University, USA
University of Wisconsin, USA
Centro Atómico Constituyentes, Argentina
GEMA, Argentina
Comision Nacional de Energia Atomica, Argentina
Facultad de Cs Astronómicas y Geofísicas, Argentina
Centro Atómico Bariloche and Instituto Balseiro, Argentina
Instituto de Tecnologías en Detección y Astropartículas, Argentina
Instituto Argentino de Radioastronomía, Argentina



Funding agencies

COSMOS

www.cosmosnet.it

Cosmic Orbital and Suborbital Microwave ObservationS

- **3 yrs project financed by ASI**
- **11 nodes + ASI/SSDC**
- **More than 100 people**
  - Universities
  - INAF
  - INFN

- **Università di Roma "Tor Vergata"**
- **Università di Milano**
- **Sapienza Università di Roma**
- **INAF/IASF, Bologna**
- **INAF/OATS, Trieste**
- **Università di Milano-Bicocca**
- **Università di Genova**
- **INFN-Sezione di Pisa**
- **Università di Ferrara**
- **Università di Padova**
- **SISSA – Trieste**

COSMOS

Cosmic Orbital and Suborbital Microwave ObservationS

www.cosmosnet.it

- **Activities**
  - The science case
  - Foreground cleaning/de-lensing/systematics/data analysis tools
    - study of available datasets (S-PASS, Planck, WMAP, ...), preparation for forthcoming studies (LSPE, QUBIC, QUIJOTE, Simons Array), design of techniques for future satellite probes (Core, LiteBird)
  - Feasibility study for forthcoming CMB experiment
    - Ground-based
    - Balloon-borne
    - Space
- **Training ESR**
  - 11 three-years post-Doc positions

ASI/COSMOS Project

First Advancement Report

From 21/12/2016 to 21/06/2017

Program-Contract: *2016-24-H.0*
Date: *13/06/2017*
Prepared by: *The COSMOS WP Managers*
(List on page 5)

Planning future activities

- **Ground-based E4 activities**
  - We believe that this is important
  - There is the need
    - to better shape the 'E4' H2020 CMB Infrastructure Design proposal
      - See Ken Ganga talk
    - to explore more effective collaboration within the S4 framework
      - See John Carlstrom talk
- **Balloon-borne experiments**
  - We believe that we have to look better into this
    - See Paolo de Bernardis talk
- **Satellite experiments**
  - We believe it important to explore a European collaboration/ participation
    - LiteBird (see Erminia Calabrese talk)
    - Post-Core ???

Our position

- **Our Agencies require**
  - Science driven
  - Visible
  - Recognizable
  - Effective

  participation to CMB activities

- **Ready to discuss/collaborate @ $2\pi^2$ …**

- **…to decide the Italian way**