



CONSORZIO INTERUNIVERSITARIO  
PER LA FISICA SPAZIALE

Università di Catania, Firenze, L'Aquila, Milano, Roma La Sapienza, Roma Tor Vergata, Torino, Trieste e INAF



UNIVERSITA' DEGLI STUDI  
DELL'AQUILA



IL MIO VOLER CERCAR  
OLTRE LA META

# INTERNATIONAL SCHOOL OF SPACE SCIENCE

## L'Aquila - ITALY

### Observing the Universe with the Cosmic Microwave Background

L'Aquila, April 22-26, 2014

#### Programme and Lecturers

##### OBSERVING THE UNIVERSE WITH SPACE MISSIONS

F. Favata (European Space Agency)  
*ESA Programme*

M. Biserni (Thales Alenia Space)  
*Industry and space missions*

J. Tauber (European Space Agency)  
*Planck as an ESA mission*

##### THE PLANCK MACHINE

N. Mandolesi (University of Ferrara and ASI)  
*Planck objective and development*

J.-L. Puget (Institut d'Astrophysique Spatiale, Orsay)  
*Payload design & Cryochain*

A. Mennella (University of Milano)  
*LFI: instrument design and calibration*

F. Piacentini (University of Roma "La Sapienza")  
*HFI: instrument design and calibration*

##### FROM RAW DATA TO CALIBRATED MAPS

D. Maino (University of Milano)  
*From data to maps*

J. Delabrouille (AstroParticule et Cosmologie, Paris)  
*Diffuse foregrounds high frequency*

C. Dickinson (University of Manchester)  
*Diffuse foregrounds low frequency*

##### FROM LIKELIHOOD TO COSMOLOGICAL PARAMETERS

G. De Zotti (INAF Padova)  
*Sources in CMB maps*

J. Delabrouille (AstroParticule et Cosmologie, Paris)  
*Component Separation*

P. Natoli (University of Ferrara)  
*Power Spectrum and Likelihood*

##### CMB AND FUNDAMENTAL PHYSICS

A. Melchiorri (University of Roma "La Sapienza")  
*Neutrinos and CMB*

P. Natoli (University of Ferrara)  
*Parity violation*

##### POLARIZATION

C. Dickinson (University of Manchester)  
*Planck: Polarized Foregrounds*

D. Maino (University of Milano)  
*Polarization: Planck and other experiments*

A. Melchiorri (University of Roma "La Sapienza")  
*Cosmological Parameters*

##### INFLATION + NON-GAUSSIANITY

S. Matarrese (University of Padova)  
*Inflation /Non Gaussianity and high-order statistics*

E. Martinez-Gonzalez (University of Cantabria)  
*CMB anomalies /Advanced statistical methods*

##### INNOVATIVE CMB MEASUREMENT METHODS

F. Vissani (LNGS & GSSI-INFN)  
*Baryogenesis, Massive Neutrinos*

D. Mennella (University of Milano)  
*Future sub-orbital experiments*

S. Masi (University of Roma "La Sapienza")  
*Sunyaev Zel'dovich effect experiments*

##### THE FUTURE

M. Bersanelli (University of Milano)  
*Next Planck release*

P. de Bernardis (University of Roma "La Sapienza")  
*Space missions for the CMB*

L. Rossi (CERN, Genève)  
*The future of LHC*

#### Board of Directors:

P. de Bernardis [debermar@roma1.infn.it](mailto:debermar@roma1.infn.it) M. Bersanelli [marco.bersanelli@fisica.unimi.it](mailto:marco.bersanelli@fisica.unimi.it) N. Mandolesi [mandolesi@iasfbo.inaf.it](mailto:mandolesi@iasfbo.inaf.it) J.-L. Puget [jean-loup.puget@ias.u-psud.fr](mailto:jean-loup.puget@ias.u-psud.fr)

The Director of the School: U. Villante [umberto.villante@aquila.infn.it](mailto:umberto.villante@aquila.infn.it)

The Planck satellite mission has provided a multifrequency detailed view of the Universe at millimeter waves, exploring the cosmic microwave background (CMB) and the relevant foregrounds with an unprecedented combination of sensitivity, angular resolution and frequency coverage.

Meanwhile, a number of ground based and balloon-borne experiments are exploring the tiniest details of the CMB (anisotropy, polarization, spectral anisotropy, etc.) providing a wealth of new knowledge on our universe. New space mission concepts have also been proposed, involving significant technology improvements, and are actively investigated.

This school will provide an up to date review of the latest results and of their impact on cosmology and on fundamental physics. Experimental, interpretation and theoretical activities will be weighted to provide a well balanced understanding of the current status and of the forthcoming efforts in this field.

## General information

The fee of 1.000 Euro includes board and lodging at the Canadian Hotel in L'Aquila. Applications, including a brief curriculum vitae, are due before January 31st through the website: [WWW.CIFS-ISSS.ORG/APPLICATION.ASP](http://WWW.CIFS-ISSS.ORG/APPLICATION.ASP)

Some financial support will be available for a limited number of students. Applications will be evaluated by the Scientific Committee of the International School of Space Science, who will decide also on the financial support. Successful applicants will be notified by e-mail.

INTERNATIONAL SCHOOL OF SPACE SCIENCE c/o Dipartimento di Scienze Fisiche e Chimiche  
Via Vetoio, 67010 COPPITO - L'AQUILA (ITALY) E-mail: [SSC@AQUILA.INFN.IT](mailto:SSC@AQUILA.INFN.IT) | Web: [WWW.CIFS-ISSS.ORG](http://WWW.CIFS-ISSS.ORG)

The International School of Space Science is supported by:

Università degli Studi dell'Aquila - ASI - Fondazione CARISPAQ - Consorzio "Area di Ricerca in Astrogeofisica" - Thales Alenia Space - INFN - ESA - Università degli Studi di Milano