

# CURRICULUM VITAE ET STUDIORUM

## Personal data

- *Name* :  
Alessandro Melchiorri
- *Birthplace and Birthdate* :  
Rome, Italy, 28/5/1969
- *Present Position*:  
(Assistant Professor (Tenured)), Dipartimento di Fisica, Università di Roma "La Sapienza".
- *Nationality*:  
Italian
- *Residence*:  
Rome (Italy)
- *Professional Address*:  
Università degli Studi di Roma "La Sapienza", Ple Aldo Moro 5, 00185, Roma, Italy.  
Tel: 00-39-06-49914050 Fax: 00-39-06-4453397  
e-mail: [alessandro.melchiorri@roma1.infn.it](mailto:alessandro.melchiorri@roma1.infn.it)  
web page: [freya.phys.uniroma1.it](http://freya.phys.uniroma1.it)

## Education

- 1984-1989 Secondary School certificate at the State Secondary School "G. Cesare" (Rome) with marks 60/60.
- 1990-1995 Undergraduate studies in Physics at the University of Rome "La Sapienza". Undergraduate research Thesis "*Cosmic Microwave Background Polarization*", in the group of Prof. N. Vittorio. Graduated with marks 110/110 cum laude.
- 1996-1997 Civil Service in substitution of the obligatory military service at the School "Centro Elis" (Rome).
- 1997 Winner of one of the six National Fellowships for specialized studies in foreign universities (Geneve University)
- 1997 Position of assistant at Geneve University, Theoretical Group headed by prof. R. Durrer.
- 1997-1999 **Ph.D position** : winner of one of the three positions awarded by Rome University for PhD studies at the Physics Department of the University of Rome (Italy). Ph.D. thesis "*Theoretical Studies relative to Cosmic Background Anisotropies*" (Supervisor Prof. N. Vittorio).

- 1997 - 1999 Academic host at the Departement de Physique Theorique, University of Geneva, Switzerland. Invited by Prof. Ruth Durrer.
- Nov 1999 Academic host at CITA, Canadian Institute of Theoretical Astrophysics, Toronto, Ontario, Canada. Invited by Prof. Richard J. Bond.
- 2000-2002 Winner of one of the 10 Post Doctoral Fellowships awarded by the Particle Physics and Astronomy Research Council, (Oxford University, UK).
- 2000 Winner of one of the 3-years Post Doctoral Fellowships awarded by the Canadian Institute for Theoretical Astrophysics. - declined.
- April-May 2002 Academic host at the Dept. of Astrophysical Sciences Princeton University Princeton, USA. Invited by prof. David Spergel.
- 11/2002 - Present Winner of a 'Ricercatore' (Lecturer) position, Astrophysics,, Rome University, "La Sapienza".
- 11/2004 Academic Host, Fermilab, invited by Prof. Rocky Kolb and Prof. Scott Dodelson.
- 3/2005 Academic Host, Caltech, Invited by Prof. Marc Kamionkowski.
- 10/2005 Academic Host, Cornell University, Invited by Prof. Rachel Bean.
- (6-7)/2006 Academic Host, UNAM, Mexico, invited by Prof. Axel de La Macorra.
- (11-12)/2007 Science Associate, CERN, Geneva.
- (7/8)/2009 Visiting Professor, University of California, Irvine, USA.

## Teaching Experience

- 1998 Assistant at the undergraduate course in Advanced Quantum Mechanics by prof. R. Casalbuoni, Physics Department, University of Geneva.
- 1999 Assistant at the undergraduate course in Electrodynamics 2 by prof. R. Durrer, Physics Department, University of Geneva.
- 1999 Assistant at the undergraduate course in Electrodynamics 1 by prof. A. G. Clark, Physics Department, University of Geneva.
- 2000-2001 Organizer of the Journal Club seminars in Oxford.
- 2002-2005 Assistant at undergraduate courses in Physics (prof. P. Loverre, E. Massaro, L. Zanello), University of Rome.
- 2002 Course on "CMB and Galaxy Clustering" at 9th Chalong eSchool in Astrofundamental Physics, Palermo, September 2002.
- 2004-2005 20 hours Phd course in Theoretical Cosmology, University of Rome.
- 2004-2005 20 hours Phd course in Theoretical Cosmology, University of Salerno.
- 2004-2005 40 hours Undergraduate Course in Theoretical Cosmology, University of Rome.
- 2004-2005 4 hours Course on "Dark Matter and Dark Energy", International School on SZ Effect, Varenna, Lake Como, Italy, July, 2004.

2004-2005 4 hours Course on "CMB and Cosmological Parameters", School in Data Analysis and Cosmology, Valencia, September 6-11, 2004.

2005-2006 40 hours Undergraduate Course in Physical Cosmology, University of Rome.

2005-2006 60 hours Undergraduate Course in Physics I for Informatics, University of Rome.

2005-2006 20 hours Phd course in Theoretical Cosmology, University of Rome.

2006-2007 40 hours Undergraduate Course in Physical Cosmology, University of Rome.

2006-2007 60 hours Undergraduate Course in Physics I for Informatics, University of Rome.

2006-2007 20 hours Phd course in Theoretical Cosmology, University of Rome.

2007-2008 48 hours Undergraduate Course in Physical Cosmology, University of Rome.

2007-2008 60 hours Undergraduate Course in Physics I for Informatics, University of Rome.

2008-2009 48 hours Undergraduate Course in Physical Cosmology, University of Rome.

2008-2009 60 hours Undergraduate Course in Physics I for Chemistry, University of Rome.

2008-2009 10 hours Phd course in Theoretical Cosmology, University of Rome.

## Supervised Students and Final Marks

### Laurea Quadriennale (Master Thesis)

- 1. (2003) Paolo Serra, 110/110 (Now PhD student in Rome, La Sapienza, IT)
- 2. (2005) Tommaso Giannantonio 110/110 and laude (Now PhD student in Portsmouth, UK)
- 3. (2006) Michela Paganelli, 98/110
- 4. (2006) Irene Sorbera, 108/110
- 5. (2006) Barbara Paciello, 110/110
- 6. (2007) Attilio Dariol, 101/110

### Laurea Triennale (Graduate Thesis)

- 1. (2004) Luca Pagano, 110/110 and laude
- 2. (2005) Francesco De Bernardis, 110/110 and laude
- 3. (2005) Roberta Camerini, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 4. (2005) Mirko Pacifici, 105/110,
- 5. (2006) Manuela Venturi, 110/110 and laude (Now Master Student in Rome, Tor Vergata, IT)
- 6. (2006) Chiara Melchiorre 100/110, (Now Master Student in Rome, La Sapienza,IT)

- 7. (2006) Stefania Pandolfi 110/110 and Laude, (Now Master Student in Rome, La Sapienza,IT)
- 8. (2006) Elena Giusarma 106/110, (Now Master Student in Rome, La Sapienza,IT)
- 9. (2006) Valentina Mangano 110/110, (Now Master Student in Rome, La Sapienza,IT)
- 10. (2006) Roberta Gerbasi 108/110, (Now Master Student in Rome, La Sapienza,IT)
- 11. (2006) Luca Naticchioni 110/110, (Now Master Student in Rome, La Sapienza,IT)
- 12. (2006) Francesca Scipioni 107/110, (Now Master Student in Rome, Tor Vergata, IT)
- 13. (2006) Micol Benetti, 104/110, (Now Master Student in Rome, La Sapienza,IT)
- 14. (2006) Paolo Fermani, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 15. (2006) Marco Innocenti, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 16. (2006) Simona Iudicone, 106/110, (Now Master Student in Rome, La Sapienza,IT)
- 17. (2006) Martina Corsi, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 18. (2006) Emanuela Giannini, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 19. (2006) Andrea Maselli, 110/110, (Now Master Student in Rome, La Sapienza,IT)
- 20. (2006) Lisa Scalone, 108/110, (Now Master Student in Rome, La Sapienza,IT)
- 21. (2006) Vincenzo Obiso, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 22. (2006) Rosamaria Crea, 110/110 and laude, (Now Master Student in Rome, La Sapienza,IT)
- 23. (2007) Eloisa Menegoni, 106/110.
- 24. (2007) Selene Risi, 109/110.
- 25. (2007) Alfredo Carpineti, 106/110
- 26. (2007) Maria Archidiacono, 110/110 and Laude
- 27. (2007) Donatella Fiorucci, 110/110
- 28. (2008) Alice Pisani, 110/110
- 29. (2008) Giulia de Angelis 94/110
- 30. (2008) Luigi Perna 98/110
- 31. (2008) Samuele Antonucci 101/110

- 32. (2008) Rosa Maggi 104/110
- 33. (2008) Andrea Bracco 110/110 and Laude
- 34. (2008) Giovanni Pisani 110/110 and Laude
- 35. (2008) Martina Vicinanza 108/110
- 36. (2009) Maria Concetta Tringali 96/110
- 37. (2009) Najla Said 110/110
- 38. (2009) Alessandro Pasqui 99/110
- 39. (2009) Chiara Teodori 96/110
- 40. (2009) Valentina Salvatelli 110/110 and Laude
- 41. (2009) Gioia Rau 97/110
- 42. (2010) Elisabetta Giuliani 107/110

#### **Laurea Specialistica (New Master Thesis)**

- 1. (2007) Luca Pagano, 110/110 and Laude, May 2007.
- 2. (2007) Francesco de Bernardis 110/110 and Laude, July 2007.
- 3. (2008) Roberta Camerini, 110/110 and Laude, April 2008.
- 4. (2008) Erminia Calabrese, 110/110 and Laude, July 2008.
- 5. (2008) Matteo Martinelli, 110/110 and Laude, July 2008.
- 6. (2008) Silvia Galli, 110/110 and Laude, October 2008.
- 7. (2008) Stefania Pandolfi, 110/110 and Laude, October 2008.
- 8. (2009) Marco Ruzza, 110/110 and Laude, January 2009.
- 9. (2009) Elena Giusarma, 110/110 and Laude, July 2009.
- 10. (2009) Paolo Fermani, 110/110 and Laude, July 2009.
- 11. (2009) Eloisa Menegoni, 110/110, July 2009.
- 12. (2009) Alessandro Seganti, Co-supervised with Dr. Luca Amendola 110/110 and laude, September 2009.
- 13. (2009) Giammarco Campanella, Co-supervised with Dr. Giovanna Tinetti, 110/110 and laude, September 2009.
- 14. (2009) Andrea Maselli, 110/110 and laude, October 2009.
- 15. (2009) Maria Archidiacono, 110/110 and laude, October 2009.

#### **Ph. D. Past**

- 1. (2007) Paolo Serra, now postdoc at Irvine, CA, USA.

## Postdocs

- (2003-2005) Carolina Odman (Marie Curie Postdoc in Rome, La Sapienza, IT)

## External Ph. D. Examiner

- Carolina Odman, Cambridge, 2003
- Jussi Valiviita, Helsinki, 2005
- Fabrizio Briscese, Rome, 2008
- Reijo Keskitalo, Helsinki, 2009

## Collaboration and Coordination Membership

- Member of BOOMERANG (Balloon Observations Of Millimetric Extragalactic Radiation ANd Geomagnetism) experiment. <http://oberon.roma1.infn.it/boomerang/b2k/>
- Member of the OLIMPO project.
- Member of the MITO experiment.
- Member of the PLANCK LFI experiment Core Team.
- Member of the DUNE satellite Science Team.
- Member of the SAGACE satellite Science team.
- Co-Coordinator of the ASI/COFIS I/016/07/0 contract
- Associate INFN, Theory Group Rome La Sapienza. Coordinator of "Iniziativa Specifica FA51" Astroparticle Physics node in Rome.
- Associate Investigator on LFI (Low Frequency Instrument) Planck Surveyor Experiment.
- Co-coordinator of Oxford Planck Surveyor Data Processing Center.
- Co-coordinator of Oxford node of CMBNET TMR Network (2000).
- Co-organizer of CMBNET, Organisational Workshop, 6-8 December 2000, Oxford, UK.
- Co-organizer of CMBNET Workshop on Science and Parameter Extraction, Università di Tor Vergata, Roma, Italy, May 24-25, 2001.
- Co-organizer of CMBNET Workshop on Science and Parameter Extraction, University of Oxford, Oxford, UK, February 20-21, 2003.
- Co-organizer of Oxford-Princeton Workshop on Cosmology, Princeton University, Princeton, USA, March 20-21, 2003.
- Organizer of the 2009 Workshop at the Galileo Galilei Institute in Florence "New Horizons For Modern Cosmology".
- Referee for Physical Review D, Physical Review Letters, Astrophysical Journal, Astronomy and Astrophysics, International Journal of Modern Physics D, Monthly Notices of the Royal Astronomical Society.

- Invited Editor for New Astronomy Reviews, Proceedings of the 2nd CMBnet Workshop (February 2003, Oxford).
- Invited Editor for Nuclear Physics B, Proceedings Supplement, Proceedings of the GGI conference (February 2009, Florence).

## Informatic Knowledge

- a. VMS Operating System (very old, now!)
- b. Unix Operating System
- c. MS-DOS/Windows Operating System
- d. Fortran Language
- e. Basic Language
- f. C Language
- g. Experience in parallel computing on the NEC SX-4 super computer located in Manno (Lugano, Switzerland) and on the CRAY T3E-1200 supercomputer located in Bologna (Italy).

## Foreign Languages

- a. English (good)
- c. French (good)

## Publications - Refereed papers

- (1) P. De Bernardis, A. Balbi, G. De Gasperis, **A. Melchiorri**, N. Vittorio; "*CMB anisotropy at degree angular scales and the thermal history of the Universe*"; *Astrophys. J.* **480**, 1, (1997).
- (2) R. Durrer, M. Kunz, **A. Melchiorri**; "*Cosmic Microwave Background Anisotropies from Scaling Seeds: Global Defect Models*"; *Phys. Rev. D.* **59**, 123005 (1999).
- (3) **A. Melchiorri**, M.V. Sazhin, V.V. Shulga, N. Vittorio; "*The Gravitational-Wave contribution to the CMB anisotropies*"; *Astrophys.J.*, **518**, 562-569 (1999).
- (4) **A. Melchiorri**, F. Vernizzi, R. Durrer, G. Veneziano; "*Cosmic Microwave Background anisotropies and extra dimensions in String Cosmology*"; *Phys. Rev. Lett.*, 83, 4464-4467, (1999).
- (5) P.D. Mauskopf, P.A.R. Ade, J.J. Bock, J. Borrill, A. Boscaleri, B.P. Crill, P. de Bernardis, G. De Troia, P. Farese, P. Ferreira, M. Giacometti, V.V. Hristov, A. Iacoangeli, A. H. Jaffe, A.E. Lange, S. Masi, **A. Melchiorri**, L. Miglio, C.B. Netterfield, E. Pascale, F. Piacentini, and J.E. Ruhl; "*Measurement of a Peak in the Cosmic Microwave Background Power Spectrum from the test flight of Boomerang*"; *Astrophys.J. Letters*, **536**, L59-L62, (2000).

- (6) **A. Melchiorri**, P.A.R. Ade, J.J. Bock, J. Borrill, A. Boscaleri, B.P. Crill, P. de Bernardis, G. De Troia, P. Farese, P. Ferreira, M. Giacometti, V.V. Hristov, A. Iacoangeli, A. H. Jaffe, A.E. Lange, S. Masi, P.D. Mauskopf, L. Miglio, C.B. Netterfield, E. Pascale, F. Piacentini, and J.E. Ruhl; “*A Measurement of  $\Omega$  from the North American test flight of Boomerang*”; *Astrophys.J. Letters*, **536**, L63-L66, (2000).
- (7) P. de Bernardis, P.A.R. Ade, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, K. Coble, B.P. Crill, G. De Gasperis, P.C. Farese, P.G. Ferreira, K. Ganga, M. Giacometti, E. Hivon, V.V. Hristov, A. Iacoangeli, A.H. Jaffe, A.E. Lange, L. Martinis, S. Masi, P. Mason, P.D. Mauskopf, **A. Melchiorri**, L. Miglio, T. Montroy, C.B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, S. Prunet, S. Rao, G. Romeo, J.E. Ruhl, F. Scaramuzzi, D. Sforna, N. Vittorio; “*A Flat Universe from High-Resolution Maps of the Cosmic Microwave Background Radiation*”; *Nature* **404**, 955-959, (2000).
- (8) A.E. Lange, P.A.R. Ade, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, K. Coble, B.P. Crill, P. de Bernardis, P. Farese, P. Ferreira, K. Ganga, M. Giacometti, E. Hivon, V.V. Hristov, A. Iacoangeli, A.H. Jaffe, L. Martinis, S. Masi, P.D. Mauskopf, **A. Melchiorri**, T. Montroy, C.B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, S. Prunet, S. Rao, G. Romeo, J.E. Ruhl, F. Scaramuzzi, D. Sforna; “*First Estimations of Cosmological Parameters From BOOMERANG*”; *Phys.Rev.*, D63, 042001, (2001).
- (9) A.H. Jaffe, P.A.R. Ade, A. Balbi, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, K. Coble, B.P. Crill, P. de Bernardis, P. Farese, P.G. Ferreira, K. Ganga, M. Giacometti, S. Hanany, E. Hivon, V.V. Hristov, A. Iacoangeli, A.E. Lange, A.T. Lee, L. Martinis, S. Masi, P.D. Mauskopf, **A. Melchiorri**, T. Montroy, C.B. Netterfield, S. Oh, E. Pascale, F. Piacentini, D. Pogosyan, S. Prunet, B. Rabii, S. Rao, P.L. Richards, G. Romeo, J.E. Ruhl, F. Scaramuzzi, D. Sforna, G.F. Smoot, R. Stompor, C.D. Winant, J.H.P. Wu; “*Cosmology from Maxima-1, Boomerang and COBE/DMR CMB Observations*”; *Phys. Rev. Lett.*, 86, 3475-3479, (2001).
- (10) William H. Kinney, **A. Melchiorri**, Antonio Riotto; “*New Constraints on inflation from the Cosmic Microwave Background*”; *Phys.Rev.* D63, 023505, (2001).
- (11) S. Esposito, G. Mangano, **A. Melchiorri**, G. Miele, O. Pisanti; “*Testing Standard and Degenerate Big Bang Nucleosynthesis with BOOMERANG and MAXIMA-1*”; *Phys.Rev.* D63, 043004, (2001).
- (12) F. Vernizzi, **A. Melchiorri**, R. Durrer; “*CMB anisotropies from pre-big bang cosmology*”; *Phys.Rev.* D63, 063501, (2001).
- (13) R. Durrer, M. Kunz, **A. Melchiorri**; “*Reproducing the observed Cosmic microwave background anisotropies with causal scaling seeds*”; *Phys.Rev.* D63, 081301, (2001).
- (14) Louise M. Griffiths, **A. Melchiorri**, Joseph Silk; “*CMB Constraints on a Baryonic Dark Matter-Dominated Universe*”; *Astrophys.J. Letters*, (2001) L5-L10, (2001).
- (15) Rachel Bean, Steen H. Hansen, **A. Melchiorri**; “*Early-universe constraints on Dark Energy*”; *Phys. Rev. D* 64, 103508 (2001)
- (16) P.P. Avelino, S. Esposito, G. Mangano, C.J.A.P. Martins, **A. Melchiorri**, G. Miele, O. Pisanti, G. Rocha, P.T.P. Viana; “*Early-universe constraints on a time-varying fine structure constant*”; *Phys. Rev. D* 64, 103505 (2001)



- (17) I. Ferreras, **A. Melchiorri**, J. Silk; “*New Constraints on the age of the Universe*”; MNRAS 327, L47 (2001)
- (18) P. de Bernardis, P.A.R. Ade, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, K. Coble, C.R. Contaldi, B.P. Crill, G. De Troia, P. Farese, K. Ganga, M. Giacometti, E. Hivon, V.V. Hristov, A. Iacoangeli, A.H. Jaffe, W.C. Jones, A.E. Lange, L. Martinis, S. Masi, P. Mason, P.D. Mauskopf, **A. Melchiorri**, T. Montroy, C.B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, G. Polenta, F. Pongetti, S. Prunet, G. Romeo, J.E. Ruhl, F. Scaramuzzi; *Multiple Peaks in the Angular Power Spectrum of the Cosmic Microwave Background: Significance and Consequences for Cosmology*; Astrophys.J. 564 (2002) 559-566.
- (19) S. H. Hansen, G. Mangano, **A. Melchiorri**, G. Miele, O. Pisanti; *Constraining neutrino physics with BBN and CMBR*; Phys.Rev. D65 (2002) 023511.
- (20) C.B. Netterfield, P.A.R. Ade, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, K. Coble, C.R. Contaldi, B.P. Crill, P. de Bernardis, P. Farese, K. Ganga, M. Giacometti, E. Hivon, V.V. Hristov, A. Iacoangeli, A.H. Jaffe, W.C. Jones, A.E. Lange, L. Martinis, S. Masi, P. Mason, P.D. Mauskopf, **A. Melchiorri**, T. Montroy, E. Pascale, F. Piacentini, D. Pogosyan, F. Pongetti, S. Prunet, G. Romeo, J.E. Ruhl, F. Scaramuzzi; *A measurement by BOOMERANG of multiple peaks in the angular power spectrum of the cosmic microwave background*; Astrophys.J. 571 (2002) 604-614.
- (21) Rachel Bean, **Alessandro Melchiorri**; *Current Constraints on the Dark Energy Equation of State*; Phys.Rev. D65 (2002) 041302.
- (22) R. Bowen, S. H. Hansen, **A. Melchiorri**, J. Silk, R. Trotta, *The Impact of an Extra Background of Relativistic Particles on the Cosmological Parameters derived from Microwave Background Anisotropies*; Mon.Not.Roy.Astron.Soc. 334 (2002) 760.
- (23) S. Bridle, R. Crittenden, **A. Melchiorri**, M.P. Hobson, R. Kneissl, A. N. Lasenby, *Analytic marginalization over CMB calibration and beam uncertainty*, MNRAS 335, 1193 (2002).
- (24) **A. Melchiorri**, J. Silk, *On the Density of Cold Dark Matter*, Phys.Rev. D66 (2002) 041301.
- (25) G. Polenta, P.A.R. Ade, P. de Bernardis, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, K. Coble, C.R. Contaldi, B.P. Crill, G. De Troia, P. Farese, K. Ganga, M. Giacometti, E. Hivon, V.V. Hristov, A. Iacoangeli, A.H. Jaffe, W.C. Jones, A.E. Lange, L. Martinis, S. Masi, P. Mason, P.D. Mauskopf, **A. Melchiorri**, T. Montroy, C.B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, F. Pongetti, S. Prunet, G. Romeo, J.E. Ruhl, F. Scaramuzzi, *Search for non-gaussian signals in the BOOMERanG maps I: pixel-space analysis*, ApJ (2001) Astrophys.J. 572 (2002) L27-L32.
- (26) N. Aghanim, P. G. Castro, **A. Melchiorri**, J. Silk, *Cosmic Microwave Background anisotropies beyond the third peak*, Astron.Astrophys. 393 (2002) 381-388.
- (27) C.J.A.P. Martins, **A. Melchiorri**, R. Trotta, R. Bean, G. Rocha, P.P. Avelino, P.T.P. Viana, *Measuring  $\alpha$  in the Early Universe: CMB Temperature, Large-Scale Structure and Fisher Matrix Analysis.*, Phys.Rev. D66 (2002) 023505.
- (28) Asantha Cooray , **Alessandro Melchiorri**, *Small Angular Scale CMB Anisotropies: Early Universe or Local structures ?*, Phys.Rev. D66 (2002) 083001.

- (29) Asantha Cooray, **Alessandro Melchiorri**, Joseph Silk, *Is the Cosmic Microwave Background Circularly Polarized?*, Phys.Lett. B554 (2003) 1-6.
- (30) Carolina J. Odman, **Alessandro Melchiorri**, Michael P. Hobson, Anthony N. Lasenby, *Constraining the shape of the CMB: a Peak-by-Peak analysis*, Phys. Rev. D 67, 083511 (2003).
- (31) E.S. Battistelli, M. DePetris, L. Lamagna, F. Melchiorri E. Palladino, G. Savini, A. Cooray, **A. Melchiorri**, Y. Rephaeli, M. Shimon, *Cosmic Microwave Background Temperature at Galaxy Clusters*, Astrophysical Journal Letters, 580, L101
- (32) **A. Melchiorri**, C. Odman, *Cosmological Parameters from Cosmic Microwave anisotropies: Status and Prospects.*, to appear in Astrophysics and Space Science, Kluwer (in press).
- (33) **A. Melchiorri**, C. Odman, *The inflationary Gravity waves in light of recent CMB data*, Phys.Rev. D67 (2003) 021501.
- (34) L. Covi, D. H. Lyth, **A. Melchiorri**, *New Constraints on the Running Mass Inflation Model*, Phys.Rev. D67 (2003) 043507.
- (35) **A. Melchiorri**, L. Mersini, C. Odman, M. Trodden, *The State of the Dark Energy equation of State*, Phys.Rev. D68 (2003) 043509.
- (36) **A. Melchiorri**, P. Bode, N. A. Bahcall, J. Silk, *Cosmological Constraints from a Combined Analysis of the Cluster Mass Function and Microwave Background Anisotropies*, Astrophys.J. 586 (2003) L1-L3.
- (37) J. E. Ruhl, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. De Troia, K. Ganga, M. Giacometti, E. Hivon, V. V. Hristov, A. Iacoangeli, A. H. Jaffe, W. C. Jones, A. E. Lange, S. Masi, P. Mason, P. D. Mauskopf, **A. Melchiorri**, T. Montroy, C. B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, G. Polenta, S. Prunet, G. Romeo, *Improved Measurement of the Angular Power Spectrum of Temperature Anisotropy in the CMB from Two New Analyses of BOOMERANG Observations*, Astrophys.J. 599 (2003) 786-805.
- (38) K. Coble, P.A.R. Ade, J.J. Bock, J.R. Bond, J. Borrill, A. Boscaleri, C. R. Contaldi, B.P. Crill, P. de Bernardis, P. Farese, K. Ganga, M. Giacometti, E. Hivon, V.V. Hristov, A. Iacoangeli, A.H. Jaffe, W. C. Jones, A.E. Lange, L. Martinis, S. Masi, P. Mason, P.D. Mauskopf, **A. Melchiorri**, T. Montroy, C.B. Netterfield, L. Nyman, E. Pascale, F. Piacentini, D. Pogosyan, G. Polenta, F. Pongetti, S. Prunet, G. Romeo, J.E. Ruhl, F. Scaramuzzi, *Observations of Galactic and Extra-galactic Sources From the BOOMERANG and SEST Telescopes*, Astrophysical Journal, Submitted (2002).
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Assembly XXV in Sydney, Australia, 14-17 July, 2003. Edited by Matthew Colless, Lister Staveley-Smith and Raylee Stathakis. San Francisco: Astronomical Society of the Pacific, 2005., p.35

- (55) **A. Melchiorri**, *Cosmological constraints on dark energy*, Background Microwave Radiation and Intracluster Cosmology. Edited by F. Melchiorri and Y. Rephaeli. Proceedings of the International School of Physics "Enrico Fermi", Course CLIX, held at Verenna on Lake Como, Villa Monastero, July 6-16, 2005. Part of the Italian Physical Society series. ISBN 1-58603-585-1 (IOS); ISBN 88-7438-025-9 (SIF); Library of Congress Catalog Card No. 2005937974. Published by IOS Press, The Netherlands, and Societ Italiana di Fisica, Bologna, Italy, 2005, p.243
- (56) **A. Melchiorri**, S. Dodelson, P. Serra, A. Slosar, New constraints on neutrino masses from cosmology, *New Astronomy Reviews*, Volume 50, Issue 11-12, p. 1020-1024.
- (57) Jones; W. C., Ade, P. A. R.; Bock, J. J.; Bond, J. R.; Borrill, J.; Boscaleri, A.; Cabella, P.; Contaldi, C. R.; Crill, B. P.; de Bernardis, P.; de Gasperis, G.; de Oliveira-Costa, A.; de Troia, G.; di Stefano, G.; Hivon, E.; Jaffe, A. H.; Kisner, T. S.; Lange, A. E.; MacTavish, C. J.; Masi, S.; Mauskopf, P. D.; **Melchiorri**, A.; Montroy, T. E.; Natoli, P.; Netterfield, C. B.; Pascale, E.; Piacentini, F.; Pogosyan, D.; Polenta, G.; Prunet, S.; Ricciardi, S.; Romeo, G.; Ruhl, J. E.; Santini, P.; Tegmark, M.; Veneziani, M.; Vittorio, N., *Observations of the temperature and polarization anisotropies with BOOMERANG 2003*, *New Astronomy Reviews*, Volume 50, Issue 11-12, p. 945-950.
- (58) P. Serra, R. Bean, A. de La Macorra, **A. Melchiorri**, "Massive neutrinos and dark energy", *Nuclear Physics B Proceedings Supplements*, Volume 168, p. 31-33, (2007).
- (59) G.L. Fogli, E. Lisi, A. Marrone, **A. Melchiorri**, A. Palazzo, P. Serra, J. Silk, A. Slosar, *Neutrino mass and mixing: 2006 status*, *Nuclear Physics B Proceedings Supplements*, Volume 168, p. 341-343, (2007).
- (60) O. Cremonesi, **A. Melchiorri**, *Probing low energy and mass scales*, *Nuclear Physics B Proceedings Supplements*, Volume 168, p. 383-388, (2007).
- (61) G.L. Fogli, E. Lisi, A. Marrone, **Alessandro Melchiorri**, A. Palazzo, P. Serra, J. Silk, A. Slosar, *Neutrino Mass-Mixing Parameters and implications for Single and Double Beta Decay*, Prepared for the 12th International Workshop on Neutrino Telescopes, Venice, March 6-9, 2007. Published in PROCEEDINGS. Edited by M. Baldo Ceolin. Padova, Papergraf, 2007. pp. 123-127 Also in \*Venice 2007, Neutrino telescopes\* 123-138.
- (62) **Alessandro Melchiorri**, *New Constraints on Sterile Neutrino from Cosmology*, Prepared for the 12th International Workshop on Neutrino Telescopes, Venice, March 6-9, 2007. Published in PROCEEDINGS. Edited by M. Baldo Ceolin. Padova, Papergraf, 2007. pp. 493-498.
- (63) **Alessandro Melchiorri**, Francesco De Bernardis, Luca Pagano, Paolo Serra, *Cosmological Constraints on Neutrino Masses*, Proceedings of 19th Conference on High Energy Physics (IFAE 2007), Naples, Italy, 11-13 Apr 2007. Published in IFAE 2007: Proceedings. pp. 265-270.
- (64) G.L. Fogli, E. Lisi, A. Marrone, **A. Melchiorri**, A. Palazzo, P. Serra, J. Silk, A. Slosar, *Status of Neutrino Oscillations*, IFAE 2007: Proceedings. Edited by G. Carlino, G. D'Ambrosio, L. Merola, P. Paolucci e G. Ricciardi. 2008. 326 (ISBN: 978-88-470-0746-8). Published in IFAE 2007: Proceedings. pp. 219-224.

- (65) G.L. Fogli, E. Lisi, A. Marrone, **A. Melchiorri**, A. Palazzo, P. Serra, J. Silk, A. Slosar, **A global analysis of neutrino oscillations**, Published in \*Moscow 2006, ICHEP\* 284-287.

## Publications - In Italian

- (1) **A. Melchiorri**; “*Novita’ sulle anisotropie del Fondo Cosmico*”; Il Nuovo Saggiatore, Nuova serie anno 16, Numero 3-4, Pag. 32, (2000).
- (2) **A. Melchiorri**, R. Trotta; *L’Universo visto dai neutrini*; Le Scienze, Dicembre 2005.
- (2) S. Matarrese, **A. Melchiorri**, A. Riotto; *L’impronta del Big Bang*; Le Scienze, Gennaio 2007.

## Publications - Impact

- According to the SPIRES-HEP database, the total number of citations of my papers at 20/1/2010 is around 7600 with an average number of citations per refereed paper of 50. *h* number is 40.
- The BOOMERanG results appeared on the front page of several popular american newspapers including the New York Times (November 26th 1999, April 27th 2000, April 20th 2001) and have been included in the 10 most important discoveries of the year in science (Science 2000 December 22nd; 290: 2221-2225).
- The recent result on Neutrino Anisotropies obtained in collaboration with R. Trotta, appeared between the Research Highlights on Nature (July 2005). The results was also commented in other magazines like Physics World, Universe Today and The Economist.

## Invited talks at Conferences and Advanced Schools

- 1. 19th Texas Symposium on Relativistic Astrophysics and Cosmology, held in Paris, France, Dec. 14-18, 1998. “The Gravitational Wave Contribution to the Cosmic Microwave Background”.
- 2. Topological Defects and the non-equilibrium dynamics of symmetry breaking phase transition, Les Houches, 16th-26th February, 1999. “Topological Defects in Cosmology”
- 3. Les Rencontres de Physique de la Vallee d’Aoste, La Thuile, Aosta, February 27-March 4, 2000. *Plenary Talk*, “Round table on the future of Cosmology and Particle Physics”.
- 4. VIII Convegno su Problemi di Fisica Teorica, Cortona 2000, 10-20 June 2000. **Plenary Talk**. “Boomerang e i modelli cosmologici”.
- 5. Problems of vacuum energy, 24-26 August 2000, NORDITA and TAC, Copenhagen, Denmark; **Plenary Talk**. “Consequences on the Cosmological Constant from the BOOMERanG experiment”.
- 6. EuroConference on Frontiers in Particle Astrophysics and Cosmology, San Feliu de Guixols, Spain, 30 September - 5 October 2000; “Big bang nucleosynthesis and the Boomerang experiment”



- 7. “Higgs and Supersymmetry ”, Orsay, Paris, March 19-22, 2001; **Plenary Talk**, “Balloon experiments for CMB”
- 8. Convegno Informale di Fisica Teorica, Cortona, 30 May-2 June 2001; **Plenary Talk**, ”Nuovi risultati da Boomerang”.
- 9. “Frontiers of the Universe”, XIII Rencontres de Blois, 17th - 23rd June 2001; **Plenary Talk**, “Cosmological Parameters from BOOMERanG”.
- 10. COSMO-01 International Workshop on Particle Physics and the Early Universe, Rovaniemi, Aug 30-Sep 04, 2001; **Plenary Talk**, “Cosmological parameters from BOOMERanG”
- 11. Frontiers in Particle Astrophysics and Cosmology, Lenggries (Munich), Germany, 29 September-4 October 2001; **Plenary Talk**, “Status of CMBR”.
- 12. 4th Heidelberg International Conference on Dark Matter in Astro- and Particle Physics, Cape Town, South Africa (February 2002. Eds. H. Klapdor-Kleingrothaus and R. Viollier). **Plenary Talk**, “Multiple Peaks in the CMB from BOOMERanG and DASI: Consequences for Cosmology”.
- 13. “MATTER-ANTIMATTER ASYMMETRY”, XIV Rencontres de Blois, 16th - 22nd June 2002; **Plenary Talk**, “Cosmological parameters: status and prospects”.
- 14. “ON THE NATURE OF DARK ENERGY”, XVIIIth IAP Colloquium, Paris, 1st-5th July 2002; “The Death of Quintessence ?”.
- 15. 8th Summer Institute at Gran Sasso National Laboratory, “New Dimensions in Astroparticle Physics”, July 7-19, 2002, Assergi, Italy; **Plenary Talk**, “Cosmological parameters: status and prospects”
- 16. TAUP 2001 (7th international workshop on Topics in Astroparticle and Underground Physics), Sep 2001, Laboratori Nazionali del Gran Sasso, Assergi, Italy; “Early-Universe constraints from Boomerang, Dasi and Maxima”
- 17. JENAM 2002, The Cosmology of Extra dimensions and varying Fundamental Constants. Porto, Portugal, 4-7, September 2002; **Plenary Talk**, “CMB and Cosmological Parameters: Status and Prospects”.
- 18. INTERNATIONAL SCHOOL OF ASTROPHYSICS “DANIEL CHALONGE”, ASTROFUNDAMENTAL PHYSICS, Palermo, September 7-18, 2002; **Plenary Talk**, “CMB and Galaxy Clustering”.
- 19. COSMO-02, International Workshop on Particle Physics and the Early Universe, Chicago, Illinois, USA, September 18-21, 2002; “New Constraints on Dark Matter and Dark Energy”
- 20. Spanish Relativity Meeting in Gravitation and Cosmology, ERE- 2002, Menorca, Spain, September 22-24, 2002; **Plenary Talk**, “CMB and Cosmological Parameters: Status and Prospects”.
- 21. Supersymmetry and the Early Universe. Annual School and Mid-Term Review Meeting of the Fifth Framework, EC Network (HPRN-CT-2000-00152) Oxford, 26-29 September 2002; **Plenary Talk**, “CMB determination of the cold dark matter density”.
- 22. CMB and Cosmology: Where Are We? CMBNet Ringberg Meeting and Mid Term Review (2-6 December 2002, Ringberg Castle, Tegernsee, Germany); “Constraints on Inflation from CMB measurements”.

- 23. 1st Oxford-Princeton Workshop on Cosmology Dept. of Astrophysical Sciences, Peyton Hall, Princeton University, USA. March 17-18th, 2003; "The state of the equation of state".
- 24. Euresco Conference, 'What comes beyond the Standard Model', 12. - 17. July 2003 Portoroz, Slovenja; **Plenary Talk**, "'CMB and Cosmological Parameters: Status and Prospects".
- 25. AHEP 2003, International Workshop on Astroparticle and High Energy Physics October 14 - 18, 2003, Valencia, Spain;**Plenary Talk**, "CMB and Cosmological Parameters: Status and Prospects".
- 26. Rencontres de Moriond 2004, Exploring the Universe Contents and Structures of the Universe La Thuile, Italy (March 28 - April 4, 2004); **Plenary Talk**, "New constraints on Dark Energy"
- 27. International Enrico Fermi School of Physics, Background Microwave Radiation and Intracluster Cosmology,6-16 July 2004, Varenna, Italy. **Invited Lecture**, "New constraints on Dark Matter and Dark Energy"
- 28. Ecole Internationale Daniel Chalonge, 8th Paris Cosmology Colloquium 2004, Observatoire de Paris, Paris.9th-10th DECEMBER 2004 **Plenary Talk**, 'Cosmological constraints on Neutrino Physics'
- 29. 3rd Oxford-Princeton Workshop on Astrophysics and Cosmology Jadwin Hall, Princeton University, USA. February 28th-March 2nd, 2005. **Plenary Talk**, "Dark energy and the ISW"
- 30. Incontri informali di Fisica Teorica, Cortona, 28 Maggio 2005, "L'effetto Sachs Wolfe Integrato", **Invited Talk**
- 31. Ecole Internationale Daniel Chalonge, 9th Paris Cosmology Colloquium 2005, Observatoire de Paris, Paris.26th-30th June 2005 **Plenary Talk**, 'Cosmology and Neutrino Physics'
- 32. Cosmo-05, Bonn. August 28 - September 01, 2005, "New Constraints on Neutrino Physics"
- 33. ENTApP Dark Matter meeting at SISSA, October 2005, Round Table on "The covariant formulation of the MOND theory as an alternative to the existence of dark matter", **Invited Talk**.
- 34. NO-VE III International Workshop on: "NEUTRINO OSCILLATIONS IN VENICE", February 7-10, 2006, "Neutrino Masses in Cosmology", **Invited talk**.
- 35. Fundamental Physics With Cosmic Microwave Background Radiation, Irvine, March 23-25, 2006. "Constraints on Neutrino Physics from Cosmology",**Invited Talk**
- 36. L'eredit scientifica di Ettore Majorana, Rome, December 7th, 2006. "L'Universo dei Neutrini", **Invited talk**.
- 37. Problemi Attuali di Fisica Teorica, Vietri sul Mare, Salerno, March 30th-April 4th 2007, "WMAP-normalized Inflationary Model Predictions and the Search for Primordial Gravitational Waves with Direct Detection Experiments", **Invited Talk**.
- 38. XII International Workshop on Neutrino Telescopes, Venice, March 6-9, 2007, "Is Cosmology Compatible with Sterile Neutrinos ?", **Invited Talk**.

- 39. XIXmes Rencontres de Blois, Matter and energy in the Universe: from nucleosynthesis to cosmology, Blois, France, 20th May - 25th May, 2007, “New Constraints on Neutrino Physics from Cosmology”, **Invited Talk**.
- 40. IFAE 2007, VI edizione degli Incontri sulla Fisica delle Alte Energie, 11-13 Aprile 2007, Napoli, “New Constraints on Neutrino Physics from Cosmology”, **Invited Talk**.
- 41. DAC07 Data Analysis in Cosmology 2007, Santander, Spain, 9-12 July, 2007, “Cosmology and Fundamental Physics”, **Invited Talk**.
- 42. Mini-workshop on Dark-Energy and Gravitational Waves, July 25 - 27, 2007, APCTP Headquarters, Pohang, South Korea, “New Constraints on the Dark Side”, **Invited Talk**.
- 43. Ecole Internationale Daniel Chalonge 11th Paris Cosmology Colloquium 2007, August 16-18, 2007, “New Constraints on the Dark Side”, **Invited Talk**.
- 44. The Path to Neutrino Mass, Workshop 3-6 September 2007, University of Aarhus, “Constraining Neutrino Mass with Cosmology”, **Invited Talk**.
- 45. Societa’ Italiana di Fisica, XCIII National Congress Pisa, 24 - 29 September 2007, “New Constraints on the Dark Side”, **Invited Talk**.
- 46. European Science Foundation Exploratory Workshops. Porto, 26-30 March 2008, “New Constraints on the Dark Side”, **Invited Talk**.
- 47. GWADW2008 Workshop, Elba Island, Italy, May 12 to 18, 2008, “The Cosmological Gravitational Wave Background”, **Invited Talk**.

## Invited Seminars

- (1) “The Gravitational-Wave contribution to the CMB anisotropies“, Seminars of the cosmology and particle physics groups, Physics Department University of Geneva , 5/2/1998.
- (2) “A flat universe from the North American test flight of Boomerang”, Physics Department University of Geneva, 4/2/2000.
- (3) “A measurement of Omega from the Cosmic Microwave Background Anisotropies”, TAC, Copenhagen, 10/4/2000.
- (4) “A measurement of Omega from the Cosmic Microwave Background Anisotropies”, SISSA, Trieste, 11/5/2000.
- (5) “A new measurement of the curvature of the Universe with the BOOMERANG experiment”, Laboratori Nazionali del Gran Sasso, 6/6/2000.
- (6) “Multiple Peaks in the Angular Power Spectrum of the Cosmic Microwave Background: Significance and Consequences for Cosmology”, Seminars of the cosmology and particle physics groups, Physics Department University of Geneva, 8/6/2001.
- (7) “Cosmology through the eyes of BOOMERanG and Maxima”, Seminars and Colloquia, Ecole Polytechnique de Lausanne, Losanna, 11/6/2001.
- (8) “Multiple Peaks in the Angular Power Spectrum of the CMB”, Center for Astroparticle Physics and Cosmology, Imperial College, London, 15/6/2001.

- (9) “Cosmologia attraverso Boomerang e Maxima”, Dipartimento di Fisica Teorica, Turin, 3/4/2001.
- (10) “Recent results from the Boomerang experiment”, CERN, Geneva, 31/1/2001.
- (11) “Cosmology with the Boomerang experiment”, Department of Physics and Astronomy, Sussex University, UK, 26/1/2001.
- (12) ‘Recent results from the Boomerang experiment’, Institute of Cosmology, Portsmouth, 15/3/2001.
- (13) ‘Multiple peaks in the CMB power spectrum’, DAMTP, Cambridge, 5/11/2001.
- (14) “Cosmological Parameters: Status and Prospects”, 15/5/2002, Physics Department, University of Birmingham, UK.
- (15) “Cosmological Parameters: Status and Prospects”, 12/7/2002, Osservatorio Astronomico di Arcetri, Firenze, Italia.
- (16) “Cosmological parameters: status and prospects” 6/5/2002, Rutgers, Physics and Astronomy Department, N.J., USA
- (17) “Multiple peaks in the CMB power spectrum”, 3/5/2002, Princeton, Physics Department, N.J. USA.
- (18) “Cosmological parameters: status and prospects”, 28/6/2002, Physics Department, Geneva, CH.
- (19) “Cosmological parameters: status and prospects”, 23/5/2002, Osservatorio di Capodimonte, Naples, Italy.
- (20) “CMB Anisotropies: Status and Prospects”, 30/4/2003, Physics Colloquia, University of Zurich, CH.
- (21) “CMB Anisotropies: Status and Prospects”, 1/4/2003, Observatoire de Nice, Nice, France.
- (22) “New Constraints on Dark Matter and Dark Energy”, 3/7/2004, Physics Department, Rome.
- (23) “Cosmological constraints from Microwave Background Anisotropy and Polarization”, 23/6/2004, Dipartimento di Fisica, Università di Bari, Italy.
- (24) “Cosmological constraints on Neutrino Mass”, 3/12/2004, Caltech, California, USA
- (25) “Cosmological constraints on Neutrino Physics”, 21/6/2005, Physics Department, Helsinki, Finland.
- (26) “Cosmological constraints on Neutrino Mass”, 14/7/2005, Tor Vergata University, Rome, Italy.
- (27) “Latest news from the Universe”, 24/8/2005, Werner Heisenberg Institut, Munich, Germany.
- (28) “Dark Energy in the Universe”, 6/10/2005, Physics Department, University of Barcelona, Spain.
- (29) “Dark Energy in the Universe”, 11/11/2005, Physics Department, University of Chicago, U.S.A..

- (30) “Dark Energy in the Universe”, 16/11/2005, Physics and Astronomy Department, Cornell University, U.S.A..
- (31) “Dark Energy in the Universe”, 18/11/2005, Physics and Astronomy Department, Columbia University, U.S.A..
- (32) “Cosmological constraints on Neutrino Physics”, 17/2/2006, Physics Department, “ Università Federico II”, Naples, Italy.
- (33) “Cosmological constraints on Neutrino Physics”, 12/5/2006, Physics Department, University of Salerno, Italy.
- (34) “Constraints on neutrino Physics from cosmology and their impact on world neutrino data”, 28/6/2006, Physics Department, UNAM, Mexico
- (35) “Dark Energy in the Early Universe”, 23/1/2007, Scuola Normale Superiore, Pisa, Italy.
- (36) “Dark Energy in the Early Universe”, 31/1/2007, Physics Department, University of Ferrara, Italy.
- (37) “Dark Energy in the Early Universe”, 1/2/2007, ICTP, Trieste, Italy.
- (38) “I Confini dell’Universo”, 8/2/2007, Accademia dei Lincei, Rome, Italy.
- (39) “New Constraints on the Dark Side of the Universe”, 11/11/2007, DESY, Hambourg, Germany.
- (40) “Exploring the Dark Energy Redshift Desert with the Cosmic Velocity Shift”, 21/11/2007, CERN, Geneva, Switzerland.
- (41) “New Constraints on the Cosmological Dark Side”, 14/12/2007, UAM, Madrid, Spain
- (42) “New Cosmological Constraints on Neutrino Parameters “, 6/12/2007, LAPTH, Annecy, France
- (43) “New Cosmological Constraints on Neutrino Parameters “, 22/11/2007, CERN, Geneva, Switzerland
- (44) “New Cosmological Constraints on Neutrino Parameters “, 27/2/2008, INAF/IASF, Bologna, Italy
- (45) “New Constraints from Cosmic Microwave Background Anisotropies”, 13/4/2008, Scuola Normale Superiore, Pisa.
- (46) “New Constraints from Cosmic Microwave Background Anisotropies”, 15/1/2009, APC, Université de Paris, Paris.
- (47) “New Constraints from Cosmic Microwave Background Anisotropies”, 10/3/2009, SISSA, Italy.
- (48) “New Cosmological Constraints on Neutrino Physics”, 31/3/2009, LUTH, Paris.