

dr. Silvia Masi
Curriculum Vitae et Studiorum

Career :

- Born in Firenze, Italy on 29/05/1958. Married, a son in 1993.
- Laurea in Physics (summa cum laude) in 1982; Ph.D. in Physics in 1987.
- Staff position as “funzionario tecnico” in 1989; Staff position as “ricercatore universitario” in 1991, at Dipartimento di Fisica, Universita’ di Roma “La Sapienza”.
- After a national comparative evaluation for experimental physics (FIS01), has been declared idoneous as associate professor (October 2010).
- Teaches the *classes* of “Electromagnetism Laboratory” and of “Methods of Space Astrophysics” for the Physics and Astrophysics curricula at the University of Rome “La Sapienza”.
- Member of the *Ph.D. Faculty board* of the Ph.D. in Astronomy at the University of Rome “La Sapienza”
- Has served as a referee for the journals Ap.J., Astronomy and Astrophysics, MNRAS, Journal of Applied Physics.
- Serves as the *activity coordinator* for the machine shop of the Physics Department of La Sapienza.
- Has been elected in 2006 as a member of the *Committee “Macroarea 5”* (Advanced Technology and Instrumentation) of the Istituto Nazionale di Astrofisica
- Has been a member of the “*Consiglio Tecnico Scientifico*” of the Italian Space Agency for years 2007-2008
- Is a member of the *steering committee* of the Astronomy and Astrophysics from Antarctica (AAA scientific research program) of the SCAR (Scientific Committee on Antarctic Research since 2008
- Is a member of the “*Consiglio Scientifico*” of INAF since October 2011

Research Interests and Expertise:

- Experimental Astrophysics in the Far IR / mm bands. Author or co-author of more than 100 papers on international journals with referee, and more than 100 in conference proceedings.
- Her interest is focused on Observational Cosmology, developing advanced instrumentation for precision measurements of the Cosmic Microwave Background and analyzing the data with special attention to Galactic foregrounds.

- She is internationally recognized as an expert in Balloon and satellite-borne instrumentation, Space Cryogenics, Bolometric detectors and related electronics and optics.
- Has participated in several Antarctic expeditions, as member and spokesperson of the BOOMERanG team at the McMurdo base, and as the PI of the BRAIN experiment at the Concordia – Dome-C site, and CO-PI with Yannick-Giraud Herod for the QUBIC experiment, a ground based experiment recently approved in France and Italy, to be operated from the Antarctic French-Italian Base in Dome-C.
- Has worked at the data analysis and physical interpretation of the data of CMB anisotropy and polarization experiments, with particular interest to the study of interstellar dust as a contaminating foreground.
- Member of the HFI core team, she actively participates to the data analysis from the Planck satellite, operating since 2009 in L2.

Experimental Activities:

- Participated in about 10 balloon flights of experiments aimed at astronomical / cosmological investigations in the FIR / mm range (ULISSE, ARGO, BOOMERanG, ARCHEOPS)
- Member and spokesperson of the BOOMERanG collaboration, in charge of the cryogenic system development and field operations: her activity has been pivotal for the success of the mission. The BOOMERanG-1998 experiment has produced the first detailed maps of the CMB, and measured the curvature of the Universe in 2000. Silvia Masi has coordinated the data analysis related to interstellar dust, which was extremely important in assessing the cosmological origin of the degree-sized fluctuations of the CMB discovered by the experiment. Similarly she contributed to the second flight of BOOMERanG-2003, among the first experiments detecting polarization of the CMB.
- Scientific Associate of the HFI and LFI instruments on the Planck satellite (ESA), in charge of the cryogenics of the JFET amplifiers for HFI; member of the “*core team*” for the HFI.
- In charge of the stellar sensor for the ARCHEOPS stratospheric balloon experiment.
- Participated to the 1998, 2000, 2002, 2003, 2005, 2006 Italian Antarctic Expeditions, working for the BOOMERanG (McMurdo) and BRAIN (Dome-C) experiments.

- Principal Investigator of the BRAIN interferometer, an automated CMB polarization detector operating from the French-Italian base of Dome-C, on the Antarctic Plateau. For this experiment she has developed and operated successfully for the first time a pulse tube refrigerator in the harsh temperature and altitude conditions of the Antarctic plateau.
- Principal Investigator of the OLIMPO international balloon experiment, a 2.6 m telescope for cosmology in the mm/sub-mm to be flown in 2008, funded by ASI. OLIMPO is an ambitious instrument implementing bolometer arrays and a large mm-wave telescope on a stratospheric balloon.
- Member of the B-Pol collaboration, a satellite proposed to ESA-Cosmic Vision in 2007 to measure the polarization of the CMB with unprecedented sensitivity and accuracy. Silvia Masi is in charge of the complex cryogenic system of the payload.
- Member of the SAGACE collaboration, a satellite aimed at the measurement of a large catalog of SZ clusters and AGNs at mm/sub-mm wavelengths. The satellite has been selected by ASI in 2008 for a 8 months phase-A study. Silvia Masi has been in charge of the 0.3K cryogenic system.
- Member of the Kinetic Inductance Detectors development team at the University of Rome, in charge of the cryogenic system. The effort, called RIC and funded by INFN, is a national collaboration involving scientists from IRST-ITC (Fondazione Bruno Kessler now) in Trento, from University of Perugia and from IASF Bologna and INFN Ferrara.
- Member of the team developing polar night balloon flights from the Svalbard islands, promising long-duration (2-3 weeks) flights of large payloads completely without solar illumination. Has led this activity in the framework of International Polar Year 2008, and had a key role in the launch of the first large balloon (800000m³) from Longyearbyen in 2009.
- In this framework she has organized the 1st workshop on science and technology through long duration balloons, Roma, 3-4 June 2008, with more than 100 participants.
- (see <http://projects.iasf-roma.inaf.it/Balloons/LDBalloonsProgramme2.htm>).
- Collaborates to the development of the PILOT experiment, a French led stratospheric balloon experiment aimed at measuring the polarized emission of interstellar dust in various parts of the sky in the far infrared.
- Collaborates to the development of millimetric components in the ASI funded contract Millimeter Wave Technology (national collaboration including both Industry and Research Centers)
- CO-I and Instrument Scientist, in the Long Duration Balloon experiment LSPE (Large Scale Polarization Explorer) recently funded from ASI to fly from polar regions during the winter season, taking advantage of the night in order to perform sensitive measurements of polarized emission from CMB,

with minimal contaminations from local emission, and to be used as a precursor for a more ambitious satellite mission: responsible for several of the work packages.

- Has or has had long term international collaborations with the groups of prof. Andrew Lange (Caltech) prof. Paul Richards and Adrian Lee (Univ. of California at Berkeley), prof. Barth Netterfield (Univ. of Toronto), prof. Peter Ade, Phil Maukopf (Univ. of Cardiff), prof. J.L. Puget (IAS Orsay), prof. J.M. Lamarre (LERMA Paris), prof. Monique Signore (Ecole Normale Supérieure, Paris), prof. Yannick Giraud Heraud (APC Paris).

Latest refereed publications (2010-2011):

- Clouds, filaments, and protostars: The Herschel Hi-GAL Milky Way
Molinari S., et al.
Astronomy and Astrophysics, 518, L100, (2010)
DOI: 10.1051/0004-6361/201014659
- On the effect of cosmic rays in bolometric CMB measurements from the stratosphere
Masi S., et al.
Astronomy and Astrophysics, 519, A24 (2010)
DOI: 10.1051/0004-6361/201014065
- Variations of the spectral index of dust emissivity from Hi-GAL observations of the Galactic plane
Paradis D., et al.
Astronomy and Astrophysics, 520, L8 (2010)
DOI: 10.1051/0004-6361/201015301
- Extracting cosmological signals from foregrounds in deep mm maps of the sky
Conversi L., Fiadino P., de Bernardis P., Masi S.
Astronomy and Astrophysics, 524, A7 (2010)
DOI: 10.1051/0004-6361/200912838
- Properties of Galactic Cirrus Clouds Observed by BOOMERANG
Veneziani M., et al.
The Astrophysical Journal, 713, 959-969 (2010)
DOI: 10.1088/0004-637X/713/2/959
- Progress in precision measurements of the cosmic microwave background
de Bernardis P., Calvo M., Coppolecchia A., Cruciani A., Giordano C., Masi S., Nati F., Salatino M., Schillaci A.
Nuclear Physics B, 217, 15-20 (2010)
DOI: 10.1016/j.nuclphysbps.2011.04.057
- A cryogenic waveplate rotator for polarimetry at mm and submm wavelengths
Salatino M., de Bernardis P., Masi S.
Astronomy & Astrophysics, 528, A138 (2010)
DOI: 10.1051/0004-6361/201015288
- COre (Cosmic Origins Explorer) A White Paper
The COre collaboration, 2010
2011arXiv1102.2181T
- Development of Kinetic Inductance Detectors for Cosmic Microwave Background experiments
Calvo M., Giordano C., Battiston R., de Bernardis P., Margesin B., Masi S., Monfardini A.
Experimental Astronomy, 28, 185-194 (2010)
DOI: 10.1007/s10686-010-9197-y
- BOOMERanG constraints on primordial non-Gaussianity from analytical Minkowski functionals
Natoli P., et al.
Monthly Notices of the Royal Astronomical Society, 408, 1658-1665, (2010)
DOI: 10.1111/j.1365-2966.2010.17228.x
- QUBIC: The QU bolometric interferometer for cosmology
Battistelli E., et al.
Astroparticle Physics, Volume 34, Issue 9, p. 705-716, (2010)
DOI: 10.1016/j.astropartphys.2011.01.012
- Planck early results. I. The Planck mission

- Planck Collaboration
Astronomy and Astrophysics 536, A1 (2011)
DOI: 10.1051/0004-6361/201116464
- Planck early results. II. The thermal performance of Planck
Planck Collaboration
Astronomy and Astrophysics 536, A2 (2011)
DOI: 10.1051/0004-6361/201116486
 - Planck early results. IV. First assessment of the High Frequency Instrument in-flight performance
Planck HFI Core Team
Astronomy and Astrophysics 536, A4 (2011)
DOI: 10.1051/0004-6361/201116487
 - Planck early results. VI. The High Frequency Instrument data processing
Planck HFI Core Team
Astronomy and Astrophysics 536, A6 (2011)
DOI: 10.1051/0004-6361/201116462
 - Planck early results. VII. The Early Release Compact Source Catalogue
Planck Collaboration
Astronomy and Astrophysics 536, A7 (2011)
DOI: 10.1051/0004-6361/201116474
 - Planck early results. VIII. The all-sky early Sunyaev-Zeldovich cluster sample
Planck Collaboration
Astronomy and Astrophysics 536, A8 (2011)
DOI: 10.1051/0004-6361/201116459
 - Planck early results. IX. XMM-Newton follow-up for validation of Planck cluster candidates
Planck Collaboration
Astronomy and Astrophysics 536, A9 (2011)
DOI: 10.1051/0004-6361/201116460
 - Planck early results. X. Statistical analysis of Sunyaev-Zeldovich scaling relations for X-ray galaxy clusters
Planck Collaboration
Astronomy and Astrophysics 536, A10 (2011)
DOI: 10.1051/0004-6361/201116457
 - Planck early results. XI. Calibration of the local galaxy cluster Sunyaev-Zeldovich scaling relations
Planck Collaboration
Astronomy and Astrophysics 536, A11 (2011)
DOI: 10.1051/0004-6361/201116458
 - Planck early results. XII. Cluster Sunyaev-Zeldovich optical scaling relations
Planck Collaboration
Astronomy and Astrophysics 536, A12 (2011)
DOI: 10.1051/0004-6361/201116489
 - Planck early results. XIII. Statistical properties of extragalactic radio sources in the Planck Early Release Compact Source Catalogue
Planck Collaboration
Astronomy and Astrophysics 536, A13 (2011)
DOI: 10.1051/0004-6361/201116471
 - Planck early results. XIV. ERCSC validation and extreme radio sources
Planck Collaboration
Astronomy and Astrophysics 536, A14 (2011)

DOI: 10.1051/0004-6361/201116475

- Planck early results. XV. Spectral energy distributions and radio continuum spectra of northern extragalactic radio sources
Planck Collaboration
Astronomy and Astrophysics 536, A15 (2011)
DOI: 10.1051/0004-6361/201116466
- Planck early results. XVI. The Planck view of nearby galaxies
Planck Collaboration
Astronomy and Astrophysics 536, A16 (2011)
DOI: 10.1051/0004-6361/201116454
- Planck early results. XVII. Origin of the submillimetre excess dust emission in the Magellanic Clouds
Planck Collaboration
Astronomy and Astrophysics 536, A17 (2011)
DOI: 10.1051/0004-6361/201116473
- Planck early results. XVIII. The power spectrum of cosmic infrared background anisotropies
Planck Collaboration
Astronomy and Astrophysics 536, A18 (2011)
DOI: 10.1051/0004-6361/201116461
- Planck early results. XIX. All-sky temperature and dust optical depth from Planck and IRAS. Constraints on the “dark gas” in our Galaxy
Planck Collaboration
Astronomy and Astrophysics 536, A19 (2011)
DOI: 10.1051/0004-6361/201116479
- Planck early results. XX. New light on anomalous microwave emission from spinning dust grains
Planck Collaboration
Astronomy and Astrophysics 536, A20 (2011)
DOI: 10.1051/0004-6361/201116470
- Planck early results. XXI. Properties of the interstellar medium in the Galactic plane
Planck Collaboration
Astronomy and Astrophysics 536, A21 (2011)
DOI: 10.1051/0004-6361/201116455
- Planck early results. XXII. The submillimetre properties of a sample of Galactic cold clumps
Planck Collaboration
Astronomy and Astrophysics 536, A22 (2011)
DOI: 10.1051/0004-6361/201116481
- Planck early results. XXIII. The first all-sky survey of Galactic cold clumps
Planck Collaboration
Astronomy and Astrophysics 536, A23 (2011)
DOI: 10.1051/0004-6361/201116472
- Planck early results. XXIV. Dust in the diffuse interstellar medium and the Galactic halo
Planck Collaboration
Astronomy and Astrophysics 536, A24 (2011)
DOI: 10.1051/0004-6361/201116485
- Planck early results. XXV. Thermal dust in nearby molecular clouds A25
Planck Collaboration
Astronomy and Astrophysics 536, A25 (2011)
DOI: 10.1051/0004-6361/201116483

- Planck early results. XXVI. Detection with Planck and confirmation by XMM-Newton of PLCK G266.6–27.3, an exceptionally X-ray luminous and massive galaxy cluster at $z \sim 1$ A26
Planck Collaboration
Astronomy and Astrophysics 536, A26 (2011)
DOI: 10.1051/0004-6361/201117430

- Low-resolution spectroscopy of the Sunyaev-Zel'dovich effect and estimates of cluster parameters
de Bernardis P., Colafrancesco S., Lamagna L., Marcheggiani P., Masi S., Schillaci A.
Astronomy and Astrophysics, In press, (2011)
DOI: 10.1051/0004-6361/201118062