

dr. Silvia Masi
Curriculum Vitae et Studiorum - Short Form

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, Università di Roma “La Sapienza”.
- Teaches the classes of “Laboratory of Electromagnetism” and of “Methods of Space Astrophysics” for the Physics and Astrophysics curricula at the University of Rome “La Sapienza”.
- Has served as a referee for the international journals The Astrophysical Journal, Astronomy and Astrophysics, MNRAS, Journal of Applied Physics.
- 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
- Qualified idoneous as an Associate Professor in 2010 (Selection FIS/01-A/02/08 University of Rome La Sapienza G.U.n.44 of 6/Jun/2008; D.R.15/Oct/2010 prot.542/10 of 19/oct/2010).
- Winner of a selection for 74 positions as Associate Professor ex. Art.29, comma 9, legge 240/2010 - Sapienza Università di Roma - D.R. n.4776 - 30/12/2011, GU n.4 - 17/1/2012 ; approved with D.R. Prot. 3653 of 25/Oct/2012.
- Member of the *Scientific Council* of the INAF (National Institute for Astrophysics) from 2011 to 2015.
- Staff position as “Associate Professor” at the Physics Department of the University of Rome “La Sapienza” since December 2012.

Research Interests and Expertise:

- Experimental Astrophysics in the Far IR / mm bands. Author or co-author of more than 200 papers on international journals with referee, and more than 200 in conference proceedings.
- Her interest is in the framework of 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.
- **In particular, she had the responsibility of the development of the cryostats for the ARGO, BOOMERanG, OLIMPO, LSPE balloon-borne experiments, and the cryogenic preamplifiers of the Planck satellite.**
- 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.

- 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.

Experimental Activities:

- Participated in about 10 balloon flights of experiments devoted to astronomical / cosmological investigations in the FIR / mm range (ULISSE, ARGO, BOOMERanG, ARCHEOPS)
- Member since the beginning 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. Participated in the 2005, 2006, 2008, 2009, 2011, 2012 arctic campaigns (summer and winter) in the Svalbard for stratospheric balloon launches.
- 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.
- Member of the QUBIC international collaboration, a bolometric interferometer to measure CMB polarization from Dome Concordia (Antarctica), and in charge of the design, construction and test of the cryogenic system
- Principal Investigator of the OLIMPO experiment, funded by ASI. This is a 2.6 m telescope flown on a stratospheric balloon, optimized cosmological spectroscopic observations in the mm/sub-mm. OLIMPO will also represent an important precursor for a large space telescope mission approved by the Russian Space Agency: MILLIMETRON).
- Instrument scientist and in charge of the cryogenics of the LSPE (Large Scale Polarization Explorer) long duration balloon experiment to measure CMB polarization, fully funded by ASI.
- Member of the B-Pol, CORE, PRISM and now CORE+ collaborations, satellite proposals for the ESA-Cosmic Vision program, to measure the polarization of the CMB with unprecedented sensitivity and accuracy. In charge of the complex cryogenic system of both payloads.
- Member of the SAGACE collaboration, a satellite devoted to 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 in Trento, from University of Perugia and from IASF Bologna and INFN Ferrara.
- Member of the team developing polar summer and winter (night) balloon flights from the Svalbard islands, promising long-duration (2-3 weeks) flights of large payloads (like OLIMPO and LSPE) 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 Longyearbien 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 150 participants. (see <http://projects.iasf-roma.inaf.it/Balloons/LDBalloonsProgramme2.htm>).
- Member of the PILOT stratospheric balloon experiment, to be flown by CNES, and devoted to measurements of the polarized diffuse emission from interstellar dust. She has designed, built and tested the cryostat and collaborated to the project and testing of the half wave plate cryogenic rotation mechanism.
- Italian coordinator of the international experiment QUBIC, aimed at measuring the polarization of the CMB from the Concordia base in Antarctica, using the innovative approach of bolometric interferometry.
- Member of the Antarctic Astronomy Steering committee for CMB research of SCAR, organised the latest meetings in Siena and in Portland on Antarctic Astronomy
- Member of the SOC of SaIt (2011)
- Member of the SOC of IAU 288 (Beijing, August 2012)
- Organizer and chair of a parallel session (CMB01) of the Marcel Grossmann Meetings 2015 and 2012.
- Has given the plenary talk “Filling the Universe with Light” at the 101st Annual Meeting of the Italian Physical Society in September 2015.s
- Had long term international collaborations with 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 Mauskopf (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). Is collaborating with the Norwegian Polar Institute, University of Svalbard, IKI-ASC Moscow, and Nijni Novgorod Universities.

Bibliometrics:

According to the NASA-ADS database (the best one for astronomy/astrophysics):

- To-date, Silvia Masi is author or co-author of more than 430 papers (see attached list),
- They have been cited more than **32000** times.
- **230** papers are on international, peer-reviewed journals.
- Her h-index is **81**.