

Aniello Mennella

Curriculum Vitae

Profile

Graduated in physics in 1989, I am Full Professor at the Physics Department of the University of Milan. I have been INAF (Istituto Nazionale di Astrofisica) associate from 2005 to 2020 and INFN (Istituto Nazionale di Fisica Nucleare) associate since 2016.

Since 1999 I study experimental cosmology with particular reference to the development of high sensitivity receivers for measuring the Cosmic Microwave Background.

Currently I have responsibility roles in three international experiments that aim at the detection of primordial gravitational waves traced by the so-called “B-modes” of the CMB polarization. I am Program Manager and Deputy PI of the STRIP instrument on board the Large Scale Polarization Explorer, funded ASI and INFN; I am System Scientist and member of the Collaboration and Executive Boards of QUBIC (Q&U Bolometric Interferometer for Cosmology), funded in Italy by INFN; I coordinate with other three European co-PIs the project ELFS (European Low Frequency Survey) that aims at developing a European observatory for high precision measurement of celestial in the 5–100 GHz range. From 2000 until 2018 I have participated in the ESA space mission Planck with the role of Calibration Scientist of the Planck-LFI instrument.

I have coordinated several projects of technological development in the field of microwave astrophysics instrumentation. In 2013 I have been co-founder of the microwave laboratory at the Department of Physics of the University of Milan, which I directed until 2016.

I am co-editor of the EuroPhysics Letters journal and reviewer for JCAP, IEEE Transaction on Microwave Theory and Applications, Journal of Low Temperature Physics.

At the Physics Department I teach Radio Astronomy and Space Instrumentation Laboratory, while at the Faculty of Agriculture I teach Applied Physics. I have tutored 25 BSc students, 21 MSc students and 6 PhD students as well as more than 10 post-docs.

From 1990 to 1999 I have worked at ENI (www.eni.it) in petroleum industrial research projects aimed at improving hydrocarbon exploration and production.

Since 2002 I am active in science popularization in schools and for the general public with seminars, lessons, multimedia products and by organizing public events. I am currently in the Scientific Committee of the Urlico Hoepli Planetarium in Milan. In this field I am particularly interested in the integration of various forms of communication (theatre, music, video).

My activity is documented in more than 290 publications on international journals, almost 50 publications in conference proceedings, 25 oral presentations at international conferences and more than 70 technical reports. My h-index as of Wednesday 1st September, 2021 (ADS) is 91, the number of citations excluding self-citations is 49253.

Education

Nov. 1989 **Università degli Studi di Milano, Milan, Italy, *Laurea in Physics, 110/110 cum laude.***

1983 **Liceo Scientifico S.Lorenzo, Novara, *High school diploma in Math and Science (60/60).***

Work Experience

- Feb 2021 – **Full Professor**, UNIVERSITÀ DEGLI STUDI DI MILANO - DEPT. OF PHYSICS, Milano, Italy.
now
- Mar 2015 – **Associate Professor**, UNIVERSITÀ DEGLI STUDI DI MILANO - DEPT. OF PHYSICS, Milano,
now Italy.
Worked on Planck (satellite project), Large Scale Polarization Explorer (ground-based telescope and balloon-borne instrument), QUBIC (ground-based telescope), ELFS (ground-base observatory) several technological-oriented projects. Led the Laboratory of Space Instrumentation from 2012 to 2016
- Feb 2005 – **Researcher**, UNIVERSITÀ DEGLI STUDI DI MILANO - DEPT. OF PHYSICS, Milano, Italy.
Feb 2015 Worked on Planck, Large Scale Polarization Explorer, QUBIC
- Dec 1999 – **Researcher**, NATIONAL INSTITUTE FOR ASTROPHYSICS - IASF, Milano, Italy.
Jan 2005 Worked on Planck
- Jan 1995 – **Senior Researcher**, ENI - ITALIAN HYDROCARBON COMPANY, S. Donato Milanese, Italy.
Nov 1999 Worked on enhanced oil and gas recovery, reservoir simulations, hydrocarbon migration mechanisms
- Apr 1990 – **Junior Researcher**, ENI - ITALIAN HYDROCARBON COMPANY, S. Donato Milanese, Italy.
Dec 1994 Worked on aerosol physics, wettability, enhanced oil recovery processes

Languages

Italian **Native Speaker**
English **Advanced**
French **Basic**

Science and research

Awards

- 2019 **2019 Giuseppe and Vanna Cocconi Prize**, (*Planck Collaboration*), <http://tiny.cc/EPS-2019>.
- 2018 **Marcel Grossmann Award**, (*Planck Collaboration*), <http://tiny.cc/MG-award>.
- 2018 **Gruber Cosmology Prize**, (*Planck Collaboration*), <http://tiny.cc/2018-gruber>.
- 2018 **RAS Group Achievement Award**, (*Planck Collaboration*), <http://tiny.cc/2018-RAS>.
- 2014 **NERSC Award for High Impact Scientific Achievement**, (*Planck Collaboration*), <http://tiny.cc/2014-NERSC>.
- 2010 **ESA Award for achievements in Planck**, (*Planck Collaboration*).

Scientific roles and responsibilities

For more details refer to the "Projects activities" section.

ELFS project

- Jan 2019 – **Roles**, *Project coordinator*, co-PI's: [REDACTED], Oxford University, [REDACTED] -
now [REDACTED] (Instituto de Astrofísica de Canarias), [REDACTED], SISSA, in collaboration with
CMB-S4.

ESA Planck project

- May 2007 – **Role**, *Calibration scientist of the Planck-LFI instrument.*
Dec 2016
- Dec 1999 – **Roles**, *Member of the Planck-LFI system team, coordinator of the Thermal Effects working team.*
Dec 2004

Large Scale Polarization Explorer (LSPE)

- Nov 2016 – **Roles**, *Program Manager and Deputy PI of the STRIP instrument.*
now
- Jan 2011 – **Role**, *Instrument scientist of the STRIP instrument.*
Oct 2016

Q&U Bolometric Interferometer for Cosmology (QUBIC)

- Mar 2016 – **Role**, *QUBIC System Scientist (member of the QUBIC Executive Board and Collaboration Board.*
now
- Jan 2013 – **Role**, *Responsible for the development of the antenna array, member of the Collaboration Board since 2015.*
Feb 2016

Space instrumentation laboratory at the University of Milan (μ -Lab)

- Jan 2015 – **Role**, *Laboratory head.*
Mar 2016

Other projects

- May 2019 – **Towards the Coordination of the European CMB program (EuroCMB).**
now **Role:** representative of the Italian CMB community (together with [REDACTED], SISSA).
- Sep 2016 – **Kinetic Inductance Detectors from Space (KIDS).**
now **Role:** responsible of the design and manufacturing of the optical coupling between the radiation and the detectors.
- Nov 2017 – **Rivelatori a induttanza cinetica per osservazioni astronomiche dall'Antartide in banda millimetrica e sub-millimetrica (KIDS at Dome-C).**
now **Role:** responsible of the development of the antenna array.
- Nov 2017 – **Space qualification of new polarimetric detectors.**
now **Role:** responsible of the design and development of optical coupling between the radiation and the detectors.

Teaching and tutoring

Teaching

PhD courses

- 2012 – 2016 **Science communication.**

The course was aimed at the students of the first year of their PhD in Physics and had the goal to train them towards an effective oral and written communication of science among peers.

MSc courses

2017 – now **Radio Astronomy.**

This is a two-semester course (12 credits, 84 hours) with the objective to provide the key knowledge of instruments and methods used in astronomical observations from radio to sub-millimetric waves, and to overview the main astronomical observations at these frequencies discussing the key astrophysical questions. In this course I teach the full first semester (42 hours) and half of the second semester (21 hours)

2006 – now **Laboratory of space instrumentation.**

The course (6 credits, 62 hours) aims at providing the basic know-how about scientific instruments used in astrophysical space mission, with particular reference to active and passive microwave components used in cosmic microwave background measurements. In this course I teach the first module (31 hours)

BSc courses

2005 – 2017 **Introduction to astrophysics (2nd module).**

This is a one-semester course (6 credits, 48 hours) with the objective to provide an overview of the cutting-edge questions in astronomy and astrophysics and introduce the basic astronomical concepts and tools. The course is organized in three modules and I have been responsible of the second module (14 hours) dedicated to the main experimental issues in celestial observation and a brief introduction to cosmology and cosmological observations.

2013 – now **Applied Physics - 2nd module (for the first year of the degree in Food Service Management and Human Nutrition).**

This is a one-semester course (8 credits, 85 hours) addressing the fundamentals of mechanics, electromagnetism, thermodynamics and heat transfer phenomena. In this course I teach the second module (42.5 hours) that focusses on electromagnetic and heat transport mechanisms as well as their applications in the food industry.

Tutoring

2006 – now **6 PhD students**, (*One still ongoing*).

2001 – now **21 MSc students.**

2005 – now **25 BSc students.**

Reviewing activities, conference committees

Reviewing activities

Scientific Journals

2016 – now **European Physics Letters**, *Member of the Editorial Board.*

2019 – now **JCAP**, *Reviewer.*

2015 – now **IEEE Transaction on Microwave Theory and Applications**, *Reviewer.*

2015 – now **Journal of Low Temperature Physics**, *Reviewer.*

Scientific projects

2020 **FISR Call**, *Reviewer.*

2015 **Regione Sardegna Call for Base Science projects**, *Reviewer.*

2013 **Regione Sardegna Call for Base Science projects**, *Reviewer.*

2013 **FIRB Call**, *Reviewer.*

2012 **PRIN Call**, *Reviewer.*

2012 **Regione Sardegna Call for Base Science projects**, *Reviewer.*

Conference committees

- 2016 **XV Marcel Grossmann meeting**, *Co-chair of the CM5 session on Present and future of CMB observations.*
- 2013 **International Conference “The universe seen by Planck**, *Member of the Scientific Committee.*
- 1993–1995 **International Symposium on Reservoir Wettability and its Effect on Oil Recovery (2nd, 3rd and 4th editions)**, *Member of the Scientific Committee.*

Communication and outreach

Communication and outreach

- 2002 – now **More than 50 popular conferences for schools and general public.**
A non exhaustive list of these conferences from 2005 to 2016 is available at this url: <http://cosmo.fisica.unimi.it/divulgazione/>.
- 2016 – now **Member of the scientific committee of the Milano Planetarium Urlico Hoepli.**
See: <http://lofficina.eu/comitato-scientifico-lofficina-del-planetario-di-milano/>.
- 2014, 2015 **Summer camp “La radio del cosmo” - 1st and 2nd editions**, *Scientific organization.*
A week-long Summer camp on the Sardinia Radio Telescope site dedicated to high-school students to study Radio Astronomy and learn about one of the most advanced radio telescopes in the world, See <http://www.sterrenlab.com/camps/la-radio-nel-cosmo-2014/> and <http://www.sterrenlab.com/camps/la-radio-nel-cosmo/>
- 2013 **Sky-FM**, *Organizer, presenter.*
A series of public seminars on Radio Astronomy presented at the Milano Planetarium Urlico Hoepli. See <http://cosmo.fisica.unimi.it/divulgazione/sky-fm/>
- 2011 **Radio Big Bang**, *Writer, actor.*
An 8-minutes demo aimed at the production of a docu-film about cosmology and astrophysics, Produced in collaboration with TicoFilm (www.ticofilm.com). Video available at <http://vimeo.com/39332518>
- 2009 **International Film Festival “Vedere la scienza”**, *Member of the jury.*
Vedere la Scienza Festival is an international event open to the public. A whole week of films, documentaries and videos dedicated to science. See <http://www.brera.unimi.it/film/en/index.php?arg1=000000001>