

16/3/1990 Graduate in Physics at Torino University, 110/110 cum Laude.

17/10/1994 PhD in Physics and Astrophysics.

October 1995. Post Doc Fellowship at Torino University.

17/3/1997. Researcher at Torino University, Department of Fisica Generale.

1/1/2005. Associate Professor at Torino University.

1/10/2011. Full Professore at Torino University.

From June 2002 to June 2008. Coordinator of the scientific line "Gruppo 2" (Astroparticle and Neutrino physics) of the INFN, Sezione di Torino.

From 2007 to 2017 member of the Council of the Physics and Astrophysics PhD at Torino University.

Since January 2015 until September 2021 Dean of the joint council of the Physics and Optics and Optometry courses of the Torino University.

Since October 2015 until September 2024 Vice Director, in charge of the didactics, of the Physics Department of Torino University.

Since October 2009 member of the KASCADE-Grande experiment steering committee.

Since April 2024 member of the SWGO experiment steering committee.

Since 2015 I collaborate with the Moscow MEPHI University at the installation of the NEVOD-EAS array.

Since June 2022 I am the National Representative of the SWGO experiment for the INFN.

My scientific activity is in the field of experimental high energy cosmic ray physics ($E > 10^{14}$ eV).

Participating, with arrays studying different energy ranges, at the following experiments: EAS-TOP, LVD, Auger, KASCADE-Grande. After the conclusion of the KASCADE-Grande experiment I've collaborated to the preliminary studies to investigate the capabilities of the LHAASO experiment to separate events according to the mass of the primary particle. My last activities concern the developments of next generation ground based experiment to search for very high energy gamma ray sources: a SiPM based camera for the LST telescopes of the CTA telescopes and the R&D phase of a wide field of view observatory, based on water Cherenkov detectors, to measure VHE gamma rays from the Southern hemisphere (SWGO).

The two experiments that mainly characterized my scientific activity are EAS-TOP and KASCADE-Grande.

In both of them I participated both to the construction, maintenance and calibration of the plastic scintillation detectors to measure the number of EAS charged particles and to the development of the code to reconstruct the event core position and the number of particles at observation level. The former is then used to derive the energy of the primary particle generating the EAS.

I've then used the data obtained for each event to the study of the cosmic ray primary spectrum and chemical composition. I have presented the results of both experiments in many international conferences.

The main results obtained are:

- EAS-TOP spectra in number of particles measured at different zenith angles (i.e. atmospheric depths). All the spectra showed the knee, that was detected at decreasing number of particle for increasing zenith angle. This feature definitively showed that the knee is a feature of the primary

cosmic ray spectrum and is not a feature introduced by an un-correct interpretation of the experimental data.

- With EAS-TOP we also measured the spectrum in number of muons in the EAS, showing that also measuring the shower with this observable it was possible to detect the knee.
- The main result achieved with KASCADE-GRANDE was the measurement of the knee of the spectrum of the heavy component of cosmic rays. This feature was observed at an energy about 20-40 times higher than the one of the proton knee, showing that this feature is due to primary particle escape from magnetic fields.
- KASCADE-GRANDE also obtained the more stringent (at the time of the publication) limits about the large-scale anisotropy of cosmic-rays for energies above the knee of the spectrum.

In parallel to the participation at the KASCADE-Grande experiment I was also member of the Torino group of the PIERRE AUGER OBSERVATORY. I only contributed to laboratory test of the high voltage device of the photomultipliers used in the water Cherenkov detectors of the surface array and I shortly participated in the first development of the event reconstruction code.

After the conclusion of KASCADE-GRANDE I joined the LHAASO collaboration, where I contributed to the study of the performance expected in cosmic-ray physics, mainly studying the event separation in mass groups (two or more). My collaboration with the LHAASO experiment ended when INFN decided not to fund an Italian participation to that experiment.

Since 2019 my research activity concentrates on the SWGO experiment, mainly focusing on the development of a parametrized detector simulation, this code will be applied to the study of the high energy range ($E > 50$ TeV). The code is currently used to produce a huge statistic of proton generated showers, in the energy range from 50 TeV to 10 PeV. The results of this heavy simulation effort will allow to choose the experiment layout reaching the best performance in terms of energy, angular resolution, and sensitivity.

I presented the status of the SWGO collaboration in many international conferences.

In parallel to the development of the SWGO project I am also member of the CTAO collaboration, participating, with the INFN Torino group, at the development of a SiPM camera for the CTAO Large Size Telescopes.

In the years I was invited to give summary talks about high energy cosmic ray experiments at various international conferences; between them: Scineghe 2012, ISVHECRI 2012, ECRS 2014, UHECR2016, ISVHECRI 2018.

Since I had a permanent position at Torino University, I always had teaching duties, in the following I report a short list of the main courses I held:

- Electric and Magnetic fields, Physics Bachelor
- Laboratory 5, Physics Bachelor
- Mechanics, Physics Bachelor
- Physics 1, Chemistry Bachelor
- Physics 1, Mathematic Bachelor
- Physics 1, Geology Bachelor
- Cosmic Physics Foundations, master's in physics.

Selected main publications

EAS-TOP

- M. Aglietta et al. "UHE cosmic ray event reconstruction by the electromagnetic detector of EAS-TOP", (1993) NIMA, 336 (1-2), pp. 310-321.
- M. Aglietta et al. "The limit to the UHE extraterrestrial neutrino flux from the observations of horizontal air showers at EAS-TOP", (1994) Physics Letters B, 333 (3-4), pp. 555-560.
- M. Aglietta et al. "The EAS size spectrum and the cosmic ray energy spectrum in the region 10^{15} - 10^{16} eV" (1999) Astroparticle Physics, 10 (1), pp. 1-9.
- M. Aglietta et al. "The cosmic ray proton, helium and CNO fluxes in the 100 TeV energy region from TeV muons and EAS atmospheric Cherenkov light observations of MACRO and EAS-TOP", (2004) Astroparticle Physics, 21 (3), pp. 223-240.
- M. Aglietta et al. "The cosmic ray primary composition in the "knee" region through the EAS electromagnetic and muon measurements at EAS-TOP", (2004) Astroparticle Physics, 21 (6), pp. 583-596.

KASCADE-Grande

- H. Falcke et al. "Detection and imaging of atmospheric radio flashes from cosmic ray air showers", (2005) Nature, 435 (7040), pp. 313-316.
- W.D. Apel et al. "The KASCADE-Grande experiment", (2010) NIMA, 620 (2-3), pp. 202-216.
- W.D. Apel et al. "Kneelike structure in the spectrum of the heavy component of cosmic rays observed with KASCADE-grande", (2011) Physical Review Letters, 107 (17), 171104.
- W.D. Apel et al. "Ankle-like feature in the energy spectrum of light elements of cosmic rays observed with KASCADE-Grande", (2013) Physical Review D, 87 (8), 081101.
- W.D. Apel et al. "Search for Large-scale Anisotropy in the Arrival Direction of Cosmic Rays with KASCADE-Grande", (2019) Astrophysical Journal, 870 (2), 91.

PAO

- J. Abraham et al. "An upper limit to the photon fraction in cosmic rays above 10^{19} eV from the Pierre Auger Observatory", (2007) Astroparticle Physics, 27 (2-3), pp. 155-168.
- J. Abraham et al. "Correlation of the highest-energy cosmic rays with nearby extragalactic objects", (2007) Science, 318 (5852), pp. 938-943.

VARIOUS

- N.M. Budnev et al. "The primary cosmic-ray energy spectrum measured with the Tunka-133 array", (2020) Astroparticle Physics, 117, 102406.
- B. D’Ettorre-Piazzoli et al. "Chapter 4. Cosmic ray physics", (2022) Chinese Physics C, 46, 030004
- Chiavassa on behalf of the SWGO Collaboration "SWGO: a wide field of view gamma-ray observatory in the Southern Hemisphere", (2024) JINST, C02065.
- S. Abe et al. "Multiwavelength study of the galactic PeVatron candidate LHAASO J2108+5157", A&A, 673, A75 (2023)
- D. Depaoli et al. "Development of a SiPM Pixel prototype for the Large-Sized Telescope of the Cherenkov Telescope Array", NIMA, 1055, 168521 (2023)
- F. Acero et al. "Sensitivity of the Cherenkov Telescope Array to spectral signatures of hadronic PeVatrons with application to Galactic Supernova Remnants", Astroparticle Physics, 150, 102850 (2023)