CURRICULUM VITAE

Stefano Maria Mari

Profile

- Degree in Physics obtained at the University of the Rome "La Sapienza" with a final grade of 110/110.
- Master in Physics obtained at the University of Rome " La Sapienza ".
- Fellowship of the " F.A.R. " Foundation for Young Scientists" at the DESY Laboratory (Hamburg).
- PhD in Physics at the University of Perugia conducted at the DESY Laboratory (Hamburg).
- "Assistant Researcher" at the Physics Department at the Bonn University.
- "Assistant Researcher" at the DESY Laboratory (Hamburg).
- Post-Doctoral position at the University Roma Tre in Rome.
- Researcher at the Faculty of Science of the University of Basilicata in 1997.
- Researcher position at the S.M.F.N. Faculty of the Roma Tre University in 2000.
- From November 1st 2001 to November 1st 2007 member of the National Scientific Commission II of the National Institute of Nuclear Physics (INFN).
- From January 1st 2009 to December 31th 2015, member of the National Scientific Commission II of the National Institute of Nuclear Physics (INFN).
- From February 1st 2001 to December 31th 2014 responsible for the ARGO International Experiment for the INFN Section of Roma Tre.
- Associate professor at the S.M.F.N. Faculty of the Roma Tre University.
- From January 1st 2014 responsible for the INFN Section of Roma Tre of the international scientific activity DARKSIDE.
- National Scientific Qualification as a Full Professor on January 23th, 2014
- From January 1st 2015 responsible for the INFN Section of Roma Tre of the international scientific activity JUNO.
- From July 2019 responsible of the international scientific activity TAO.

Scientifc Activity

- I obtained the Master Degree in Physics at the University "Sapienza" in Rome, obtained with a thesis based on an innovative study of the charge response and time resolution of Limited Streamer Tubes (LST) for high performance detectors. LST's have been installed in the ZUES detector at the HERA collider, at the DESY Laboratory (Hamburg, Germany).

- I completed my Master in Physics at the Università di Roma " La Sapienza " working on tests on RPC prototypes (Resistive Plate counters).

- In 1990 I was awarded a fellowship funded by the "F.A.R. Foundation " to work at the DESY Laboratory in Hamburg. In the period I directly work on the installation of the ZUES detector.

- In 1993 I got my Ph.D. at the Università degli Studi di Perugia. The subject of my thesis was the selection of events with ($Q^2 \sim 0$), high transverse energy and jets in order to study photo-production processes. The analysis of this data has clearly highlighted the so-called "adronic" component of the photon. These events were selected at HERA for the first time and the cross section was measured. My Ph.D thesis was completed with the measurement of the cross section of the of the meson J/ψ semi-leptonic decay in muons.

- In the years 1994 – 1995 I was "Assistant Researcher" at the Department of Physics at the University of Bonn, joining the Bonn ZEUS group. This group was responsible for the Forward (FTD) and Backward (RTD) tracking system for the ZEUS detector. I had the responsibility of the software for decoding the ON-line data and for event reconstruction with the FTD and RTD chambers as well I was coordinating the software development to achieve a "Global Event Reconstruction" by using all tracking detectors installed in the ZUES experiment. In the final part of my collaboration with the Bonn group, I was studying the third trigger level (TLTs) for the FTD/RTD chambers.

- At a later time I was "Assistant Researcher" at the DESY Laboratory. The growing interest in the low it x physics, led me to work with the Small Rear Tracking Detector (SRTD) group in order to build a detector allowing to track particles produced at small angles from the beam line. The SRTD detector was successfully installed in the ZEUS experiment.

- In 1996 I was awarded a fellowship funded by the University of "Roma Tre" in Rome and I joined the ARGO group working on the design of a new Extensive Air Shower experiment devoted to cosmic ray measurements in the energy region from 100 GeV to thousands TeV. The project was based on a large area detector (greater than 5000 m^2) at high altitudes (over 4000 m above sea level, in the Tibet region, China. I was responsible to install in the Tibet region the "ARGO-test" demonstrator, a small carpet of about 50 m^2 and to run it for few months. The success of ARGO-test led to ARGO project approval by the INFN Institution.

- In the year 1997 I took a permanent position as researcher at Faculty of Science at the University of Basilicata. I began my teaching duties and I joined a research team engaged in the international collaboration HESS. HESS was building an Imaging Array Cerenkov Telescope in the Namibia state in order to detect gamma sources in the TeV energy region. I developed software for ray-tracing. In the same period I collaborated with the LHCb experiment, installed at the LHC accelerator (en Large Hadron Collider) at the CERN Laboratory in Geneva, in order to develop prototypes of Thin Gap Chamber (TGC) operating at high luminosity.

- During the years 2000-2001 I continued my activity in the LHCb group at the University of Basilicata for the development of the TGC chambers and also my activity with the ARGO group of the University of Roma Tre designing the ARGO detector. The November 1st, 2000 I took a permanent position as researcher at the Faculty of Science of the Roma Tre University in Rome. At this early stage of activity at the University of Rome Tre, I set up the Computing Center of the Department of Physics at which I was responsible for this two-year period.

- Since February 1st 2001 I was leader of the ARGO group at the Roma Tre Department of Physics which had the responsibility to build all the 2100 RPC chambers needed by the experiment. In these years I was supervisor of the RPCs production, and I was responsible of quality tests and performance measurements. Data taking has been started in the year 2006. In the year 2003 I organised the Scientific Conference it " National Meeting of Astrophysics of High Energy " held in Rome on May 15-16, 2003. I was member of the Commissione Scientifica Nazionale II of the INFN from November 1st, 2001 to November 1st, 2007. Within this Commission, I was referee for different activities. In the period 2002-2005 I was faculty members of PhD in Physics at the Roma Tre University

- During this three-year period I was coordinating the activities required for an up-grade of the Data Acquisition System (DAQ) of the ARGO experiment. This up-grade was needed to support the high rate generated by low multiplicity events (~ 10 hits), i.e. low energy events (100 GeV). At the same time I was coordinating the analysis group devote to measure the primary cosmic radiation in the multi-TeV energy region. This work produced the first measure of cosmic ray energy spectrum energy in the region $(1 \div 200)$ TeV with an EAS apparatus.
  The work done and the experience gained in this field has been used to formulate two research projects in the field of Physics of Cosmic Rays with EAS detector submitted to the European Community. The two projects, which I was the coordinator, have passed the initial stage and got a final rating slightly lower than the funding threshold.
  Since 2009 I was member of Commissione Scientifica Nazionale II of the INFN.
  In September 2010 I took a permanent position as Professor at the University of Rome Tre. During the period 2002 - 2010 I was member of the Executive Board and of the Technical Board of the ARGO Collaboration.

- In the years 2011-2012 I was fully involved in the he analysis of the data produced by ARGO which led to to the important discovery of the "knee" of the energy spectrum of protons and helium nuclei in an unexpected region. In this period I was organiser of the RICAP 2011 International Conference and of the workshop "Physics of Rare Processes" dedicated to review the direct search of dark matter and the measurement of double beta decay with no neutrinos.

- In the year 2012 I founded the Darkside group at the University of Rome Tre. This group participates in the international DARKSIDE experiment dedicated to the search for dark matter. The DARKSIDE experiment, a multi-years and multi-stages activity, is based on a Liquid Argon (LAr) Time Projection Chamber (TPC) to detect nuclei-WIMP interactions. The Roma Tre group has been involved in the construction of the apparatus at the "Laboratori Nazionali del Gran Sasso" and it takes on the responsibility of data management. Many students for their graduation degree and for fellowships are engaged in the group. In the field of the Astroparticle Physics, the measurement of the mass of neutrinos and their properties is one of the still open issues of great scientific interest, with profound implications not only in the elementary particle sector but also in the evolution of the Universe. Because of that, I started a small group to

conduct research activities on neutrino physics. The study of the physics of the double beta decay with no neutrinos (0nuDBD) is of utmost importance in this area. In co-operation with other Universities, I formulated a PRIN project in 2014 entitled: "Development of low-radioactivity detectors for the study of the mass and nature of the neutrino through the double beta decay" that has been approved by the MIUR. The project is devoted to study the possibility to build large mass detectors by means of Xe-136 isotope dissolved in liquid scintillator. On January 23th, 2014 I obtained the National Scientific Qualification as a Full Professor.

- At the end of the year 2014, I formed the Juno group at the University of Rome Tre, this group participates in the international JUNO experiment dedicated to investigate the neutrino mass hierarchy and the neutrino properties by means of 20ktons, liquid scintillator detector placed at about 50 km far from a reactor power plant. The advent of nuclear reactors as intense source of electron antineutrinos (anti-nu_e) and the development of large volume liquid scintillator detectors allow to detect neutrinos directly via the Inverse Beta Decay (IBD) reaction. The JUNO detector will be built in the Jiangmen province (China), it will determine the neutrino Mass Hierarchy, the excellent energy resolution and large fiducial volume will also lead to a precise determination of the neutrino oscillation parameters to an accuracy of better than 1%. I coordinate the JUNO group that is in charge of the layer 2 (L2) of the trigger system. The L2 trigger will be realised by means of custom board able to manage an unprecedented aggregate data throughput. In addition the group is in charge to define the JUNO Computing Model to face the Monte Carlo and data management. In the year 2018 the JUNO Collaboration decided to build a new detector (TAO), devoted to measure the neutrino flux at the reactor site with high accuracy and precision. I'm coordinating the TAO project.