

Francesco Riggi

Curriculum Vitae

Francesco Riggi was born in 1951. He received his master degree in Physics from the University of Catania in 1974. From 1975 to 1979 he was a fellow of the CSFN (Sicilian Center for Nuclear Physics). In 1980 he got a permanent position at the University of Catania as a Researcher, then as Associate Professor and Full Professor (since 2001) in Experimental Nuclear and Particle Physics at the Department of Physics and Astronomy.



Scientific Research

He has been working for about twenty years (1974-1995) in the field of nuclear physics at low and intermediate energies, participating to experiments concerned with three-body final state nuclear reactions, subthreshold pion and kaon production at intermediate energies, and heavy ion collisions with large multidetectors. Since 1995 he joined the field of ultra-relativistic heavy ion collisions at CERN, within the NA57 Collaboration, devoted to the study of strangeness enhancement in high energy collisions, and later in the ALICE Collaboration, a large (>1000 participants) international experiment devoted to the study of nuclear matter under extreme density and energy density conditions at the Large Hadron Collider (LHC). Within the ALICE Collaboration he has been involved with a research team in Catania in the construction of the Silicon Pixel Inner Tracker System (ITS) and of the Electromagnetic Calorimeter. He is also presently involved in the upgrade activities of this experiment. The physics items of personal interest in heavy ion collisions with the ALICE detector are concerned with the study of strangeness production as a signature of the Quark Gluon Plasma formation, with the investigation of short lived resonances and with the production of light nuclei and anti-nuclei.

He has also been actively carrying out research in the field of Cosmic Ray physics, where he is a member of the EEE Collaboration (an extended network of cosmic ray telescopes built and operated by high school teams) and in various applications of the cosmic ray radiation, concerned with muon tomography techniques, where he has leaded a four-years Project for the construction of a real size prototype detector ($3 \times 6 \times 7 \text{ m}^3$), able to inspect the interior of a cargo container to signal the presence of high-Z fissile materials.

He has also contributed during his career to other scientific areas of research, in collaboration with the Chemistry Department in Catania and Melbourne, including the study of electron paramagnetic resonance (EPR) of Transition Metal complexes, and the use of molecular mass spectrometry with heavy ions.

He is author or coauthor of about 500 peer-reviewed scientific papers in all such areas and has contributed to several International Conferences, with invited and contributed talks. His recent (July 2018) H-index (Hirsch) is 59.

During his scientific career, he has spent various periods abroad, collaborating with many international Institutions and Laboratories: GANIL, CEN-Saclay and Orsay (France), Monash University (Melbourne, Australia), Tandem Laboratory (Daresbury, UK), Demokritos Centre (Athens, Greece), Ruder Boskovic Institute (Zagreb, Croatia), TSL Laboratory (Uppsala, Sweden)

INR (Moscow, Russia), Michigan State University (USA), CERN, DESY (Germany). He is associated to various scientific Institutions and Societies since many years (CSFN, CERN, SIF, Centro Fermi,..)

He has been team leader for various research projects, funded by the National Institute for Nuclear Physics (INFN) and the Italian Minister for Education and Research (MIUR), concerned with nuclear and applied physics. He has also been responsible for a PON Project on Muon Tomography (2011-2015). He acts as referee for several international Journals in Nuclear and Applied Physics and has been organizer or member of the Editorial Board for various international Conferences and Workshops.

University Teaching Activity

As a professor at the Department of Physics and Astronomy of the University of Catania, he has been teaching Experimental Physics since more than 35 years, for students in Biology, Chemistry, Geophysics and Physics Curricula. Specific courses in Physics (Bachelor, Master and PhD Curricula) over the past years included: High Energy Nuclear Physics, Experimental Methods in Nuclear Physics, Modern Physics Laboratory Course, Cosmic Ray Physics Laboratory,...). He has been supervisor of more than 50 master and PhD theses, and coauthor of a textbook in experimental physics. As a part of the teaching activity in Physics he has published several papers on educational experiments at various levels (high school and undergraduate) in peer-reviewed scientific Journals. He has also been lecturer for two interdisciplinary courses: “History of Physics” and “Scientific Museology” within the Faculty of Science of the University of Catania. For about ten years he has also been a member of the Faculty of Theology in Catania, where he contributed giving lectures on Epistemology, History and Philosophy of Science.

Outreach and educational activity

In over 40 years he has devoted a particular attention to the organization of a variety of educational and outreach activities, addressed to citizen people and to high school teachers and students. These included:

- Classroom lectures on the Big Questions in science and technology, especially addressed to young people. Several lectures per year were delivered in high schools or during public events.
- Seminars on the advancement of science, especially in nuclear, particle and cosmic ray physics, to establish a link between the advanced research work in big Laboratories and the everyday knowledge of recent results.
- Organization of exhibitions and public events to promote scientific knowledge in the local territory. Examples of this activity are the following exhibitions:
 - “*The Ancient Cosmologies of the Mediterranean people*”, a study of the evolution of the vision of the world and its relation to the religious vision among the ancient civilizations of the Mediterranean.
 - “*50 years of The Van de Graaff accelerator in Catania*”, a recollection of the history of one of the first particle accelerators in Europe and its use for more than 50 years.
 - “*Powers of Ten*”, a series of 42 panels to show a travel through the size of the objects, from the quarks to the large scale of the Universe.
 - “*ESPLORA*”, a collection of 50 physics interactive experiments to show unusual and fascinating aspects of everyday life.
- The writing of a large number of articles in newspapers. Over the years he has collaborated with several educational Journals and local newspapers, writing about 150 articles, many of

which concerning Science and Culture. He is also member of the Editorial Board of the University of Catania NewsLetter Journal (Bollettino di Ateneo).

- Participation to local radio and TV programs, giving interviews on various aspects of science and its relation with applications and everyday life.
- Participation and organization of yearly educational events, such as “*The Night of Researchers*” and “*Open Scientific Weeks*”, public events organized in the town and receiving a large audience from citizens.
- Design of CD-ROM and Web-based educational materials concerning the use of particle detectors in physics.
- Participation to the National Italian Project “Extreme Energy Events”, a large scale network of cosmic ray detectors built and operated by high school teams, involving more than 1000 teachers and students over all Italy.

He is also member of the Teaching Board for the enrollment of high school teachers in Physics.

For several years, as a professor in Scientific Museology at the University of Catania, has promoted interdisciplinary studies and collaborated with scientific museums for the organization of public exhibitions.

Institutional and Organizational Activity

He has been member of the various Teaching and Institutional Boards in the Physics Department and in the former Faculty of Science at the University of Catania. Since 2005, for more than ten years he has been Coordinator of the PhD School in Physics in Catania and responsible of the Library of the Department of Physics and Astronomy. He has been member and president of several Evaluation Committees for the enrollment of University Researchers and Professors in Experimental Physics in several Italian Universities (Bologna, Salerno, Bari, Catania, Roma) and Research Institutions. Since 2016 he is member of the National Italian Committee for the evaluation of associate and full professorship candidates in “Experimental Physics of Fundamental Interactions” (Abilitazione Scientifica Nazionale).