Fabrizio Odorici

Indirizzo: c/o INFN Sezione di Bologna, viale B. Pichat 6/2, 40127 Bologna
e-mail: fabrizio.odorici@bo.infn.it

Curriculum

Laureato in Fisica *cum laude* presso l'Università di Bologna nel 1988, Fabrizio Odorici è un fisico sperimentale, attualmente in servizio come primo ricercatore nel campo delle "macchine acceleratrici di particelle e tecnologie avanzate" presso la Sezione INFN di Bologna. Dal 1988 ad oggi ha svolto attività di ricerca legata alla fisica delle particelle elementari, occupandosi sia di analisi fisica dei dati, sia di sviluppo ed applicazioni di tecnologie per l'elettronica, i rivelatori e l'informatica. In particolare ha progettato e curato la realizzazione di sistemi elettronici digitali, applicati all'acquisizione dati ed al trigger. Ha studiato ed applicato microprocessori neurali, analogici e digitali, nel trigger di un esperimento di fisica di alte energie. Ha progettato e curato la realizzazione di dispositivi ASIC e circuiti elettronici per il trigger di primo livello dell'esperimento CMS presso il CERN di Ginevra.

Dal 2002 coordina un gruppo di ricerca che si occupa di nanotecnologie per applicazioni in fisica delle alte energie tra cui rivelatori di particelle ad elevata risoluzione spaziale, ed applicazioni nucleari come sorgenti di elettroni a nanostrutture per macchine acceleratrici e al plasma e per alcuni impieghi industriali. In tali campi è stato proponente e responsabile nazionale di numerosi progetti di ricerca, tra cui NANOCHANT, SERENA, CANTES, ESOPO e PLANETA.

Per la Sezione INFN di Bologna, dal 2005 al 2011 ha svolto il ruolo di coordinatore degli esperimenti di ricerca tecnologica e membro della Commissione Scientifica Nazionale 5 dell'ente. Dal 2012 è referente locale per il Trasferimento Tecnologico dell'ente verso l'industria.

Nel corso dell'attività scientifica ha contribuito ad oltre 700 pubblicazioni, è stato referee di riviste internazionali ed ha presentato i risultati delle ricerche a numerose conferenze nazionali ed internazionali.

Bologna, li 25 marzo 2020

Fabrizio Odorici

Curriculum Vitae of Francesca Rizzo

Personal Data :
Address: Dipartimento di Fisica e Astronomia and INFN-Laboratori Nazionali del Sud (LNS),
Via Santa Sofia 64, 95123, Catania
E-mail: rizzo@lns.infn.it
Born:
Citizenship: Italian

Scientific Degree:
Laurea (Master) Summa Cum Laude in Physics (1978, Catania University)

Current Position:
November 2001 - present Associate Professor in Nuclear and Sub-nuclear Physics,Catania University
May 1983-October 2001 Researcher at the Department of Physics, Catania University
November 1978 – present Associate researcher to Istituto Nazionale Fisica Nucleare (INFN)

Teaching Activity (Catania University):
-"Physics and Physics Laboratory" for Chemistry Degree students.
-"Elements of Nuclear and Sub-nuclear Physics" for Physics Degree students.
Supervisor of several Degree, Master and Ph.D. Theses in Physics.

Research Activity:
The Research Activity, of experimental nature, started with the Thesis work and has been done, since the beginning, inside the programs and with the support of INFN. It has been performed in different Laboratory, both Italian (INFN-Laboratori Nazionali del Sud, INFN-Laboratori Nazionali di Legnaro) and foreign (GANIL, Caen, Francia; GSI, Darmstat, Germania; Cyclotron Laboratory of Louvain-la-Neuve, Belgium). However the Laboratory mainly used is the INFN Laboratori Nazionali del Sud (LNS) of Catania where prof. F.Rizzo was and is currently involved in several Scientific Responsibility (see below) and activities, in particular Prof.F.Rizzo is, since 2016, the responsible of the User Service which include Chemical-Physical Techniques, Electronics and Detectors, Experimental apparatus operation and maintenance.
The research activity concerns:

1. Fundamental Nuclear Physics
2. Nuclear techniques applied to the Cultural Heritage Field

1. Fundamental Nuclear Physics: Study of heavy ion collision using stable and exotic beams

The experiments are usually performed at the LNS-INFN of Catania, using the beams produced by the accelerator CS and detecting the reaction products with the multidetector 4π CHIMERA. In particular, the role of isospin on the production of intermediate mass fragments (IMF) has been investigated in different colliding system having different N / Z ratio in the entrance channel, 112Sn + 58Ni and 124Sn + 64Ni at 35 MeV / A, in direct and inverse kinematics, both in central and peripheral collisions. It has been observed that the isoscaling parameters have a behaviour consistent with the liquid-gas phase transition, also for the MFIs dynamically emitted at the "mid-velocity" by the neck region, after a short time from the collision. To this end, a new method of analysis has been developed that allows to measure the time scale for MFI emission. Many other colliding systems (48Ca + 48Ca, 42Ca + 54Fe, 40Ca + 40Ca, 40Ca + 48Ca and 40Ca + 46Ti at 25 MeV / A) were studied at the INFN-LNS to explore the influence of isospin on the reaction mechanism; it has been found that the neutron-rich colliding systems proceed through incomplete fusion, while the neutron-poor ones follow a binary reaction

mechanism. This result can be directly connected with the Symmetry Energy of the State Equation (EOS) of nuclear matter and suggests a "stiff" behaviour at saturation density.

A further result on this subject has been obtained studying the 197Au + 197Au collision at 400MeV/A (GSI, Darmstat). This colliding energy allows to explore the Symmetry Energy of the EOS for nuclear matter above the saturation density. The obtained results show a moderately "soft" behaviour.

Prof.F.Rizzo is one of the principal proposers and developer of the detector systems suitable for those experiments:

- CHIMERA, a 4π multidetector system of last generation formed by 1192 telescopes, each one composed by a silicon detector (300 μm) and CsI(Tl) scintillator;
- FARCOS (Femtoscope ARray for COrrelations and Spectroscopy) array having high energy and angular resolution, constitute by 20 triple telescope, Double Sided Silicon Strip Detectors (DSSSD) as first (300 μm) and second (1500 μm) stages followed by CsI(Tl) crystals.

Both apparatus are operating at the INFN-LNS.

Since 1998 Prof. F.Rizzo collaborates on a scientific line dedicated to the study of the nuclear structure, reaction mechanisms and decay of exotic nuclei. The first experiments were done in the Cyclotron Laboratory of Louvain-la-Neuve (Belgium). The twofold goal is to study the structure of this exotic nuclei, like 13N, 6He, and to investigate if and how the presence of weakly bound 'last' nucleons of radioactive nuclei influence reaction mechanisms. The data analysis evidenced the existence of a mixed structure for the ground state of 13N and has been found that the 2 nucleons weakly bound in 6He do not influence considerably the sub-barrier fusion cross section. The influence of the neutron-halo in the 10,11Be exotic nuclei on the reaction mechanism has been studied through the 10,11Be+64Zn collision at REX-ISOLDE facility of CERN. More recently the study has been extended on exotic nuclei produced by the technique of fragmentations in flight at LNS (Facility FRIBS). Starting from primary beam of 13C / 16O / 18O (55 MeV / A) colliding on a thick beryllium target, different secondary exotic beam are produced along the neutron drip-line. (10,11 Be, 12,13 B, 16C). The first reactions induced on CH2 and CD2 targets were measured. In particular, has been investigated the 10Be and 16C structure by analysing the break-up events in 4He-6He and 6He-10Be respectively. Starting from a primary beam of 70Zn, an exotic beam of 68N (neutron-rich nuclei) was produced that allowed the study of the isoscalar excitation of the PDR Resonance (Pygmy Dipole Resonance), through the collision 68Ni + 12C at incident 28 MeV / A energies.

In the context of the fundamental nuclear physics, several other topics have been explored :

- Study of reaction mechanisms through Gamma rays- charged fragments coincidence measurements in heavy ions collisions at low and intermediate incident energies
- Study of dissipative processes in heavy ions collisions at energies around the Coulomb barrier.
- Study of Nuclear Reactions induced by 6Li-ions on medium-light nuclei

The experiments have been performed at INFN-LNL, INFN-LNS and at CEN-CEA, Saclay (France). In this last laboratory Prof. F.Rizzo has spent very long periods as **Visitor Scientist** to collaborate to preparation and realization of experiments, and to participate at collaboration meeting to discuss on realized or incoming experiments.

2. Nuclear techniques applied to the Cultural Heritage Field

This activity consists in the development and application of nuclear techniques to perform quantitative analysis of the elements present in artefacts of interest in the cultural heritage field. The different techniques applied are non-destructive and, apart from the use of proton beams to quantitatively analyse the metallic alloys present in the bulk of ancient coins (the proton beam to penetrate deeply in the coin must have high energy, about 25 MeV, and therefore it has to be produced by an accelerator, the Tandem of LNS in our case), are completely transportable allowing then "in situ" analysis. This last

peculiarity is particularly important because, as it is known, it is extremely difficult, and in some cases impossible, to move the archaeological artefacts to the laboratories.
Different approaches are used to make analysis depending on the depth we have to investigate.
The chemical elements present in the surface, up to 5 μm, are detected by PIXE-α technique (α-particles Induced X-ray Emission) executed by a portable device designed and realised by the experimental group at LNS. A more deep analysis is made by XRF technique (X-Ray Fluorescence) which permits to arrive up to 30 μm. The mineral components of the paintings are instead analysed by XRD technique (X-Ray Diffraction).
A mobile XRF scanning system for ultra-fast imaging (up to 100 mm per second) in real-time of large-scale painted surfaces (up to 105 x 70 cm2 in one size) was also designed.
The above described activity is carried out within the LANDIS laboratory (Laboratory of Non-Destructive Analysis) based at INFN-Laboratori Nazionali del Sud (Catania).

Scientific Responsibility
Prof. Francesca Rizzo is responsible, since 2009 at present, of LANDIS Laboratory of LNS-INFN, Catania.
Organizing Responsibility
Prof. Francesca Rizzo is responsible, since 2016 at present, of the User Office of LNS-INFN, Catania
Scientific and Organizing Activity for Conferences and Workshops:
Member of Local Organizing Committee of ASYEOS 2008, Militello Val di Catania, Italy
Member of Scientific Committee of IWM2009- Catania, Italy
Member of Local Organizing Committee of ASYEOS 2010, Noto,Italy
Member of Scientific Committee of IWM2011- Caen, France
Member of Local Organizing Committee of ANSIP 2011, Acireale, Italy
Member of Local Organizing Committee of ASYEOS 2012, Siracusa, Italy
Member of Local Organizing Committee of ASYEOS 2015, Piazza Armerina,Italy
Member of Local Organizing Committee of TECHNART 2015, Catania, Italy
Member of Local Organizing Committee of NN 2015, Catania, Italy
Member of Scientific Committee of IWM-EC 2016, Caen, France
Member of the International Advisory Committee of NRNN 2017, Messina, Italy
Member of Local Organizing Committee of MA-XRF 2019, Catania, Italy
Member of Advisory and Organizing Committee of FATA 2019, Acireale, Italy

Publications:
Co-author of more of 170 papers on scientific journals and more of 140 international conferences contributions.

Editorial Activity
2015 Editor of Conference Proceedings SIF,vol 109,"12th International Conference of Nucleus-Nucleus 2015"
2012 Editor of Conference Proceedings SIF, vol 105, "International Workshop on Multifragmentation and related topics", IWM-EC 2012
2010 Editor of Conference Proceedings SIF, vol 101, "International Workshop on Multifragmentation and related topics", IWM-EC 2010
2008 Editor of Conference Proceedings SIF, vol 95, "International Workshop on Multifragmentation and related topics", IWM-EC 2008

2006 Editor of Conference Proceedings SIF, vol 91, “International Workshop on Multifragmentation and related topics”, IWM-EC 2006

Stays Abroad:

Visitor Scientist at GANIL, France and GSI, Germany to collaborate to preparation and realization of experiment, and to participate at collaboration meeting to discuss on realized or incoming experiment.

CURRICULUM VITAE DI SALVATORE MARLETTA

marletta@lns.infn.it
Telefono 095-542253
Cell

ISTRUZIONE:
Diploma di Perito Tecnico in "ELETTRONICA INDUSTRIALE"
Conseguito presso ITIS ARCHIMEDE di Catania con 54/60
Anno scolastico 1972/1973.

ESPERIENZA:

1-1-78/23-2-79	Assistenza tecnica Apparecchiature Elettromedicali
1-3-79/28-2-83	SGS-ATES (progettazione macchine di testing, manutenzione di macchine di processo (Evaporatori, Impiantatori.....)
2001	Docenza presso ECAP in Catania: corso di formazione per la programmazione di PLC industriali. 400 ore
2003	Docenza presso ECAP in Catania: corso di formazione per la programmazione di PLC industriali. 400 ore
2004	Docenza presso ECAP in Catania: corso di formazione per la programmazione di PLC industriali. 400 ore

1-3-83 a tutt' oggi presso i LNS nel Servizio "PRODUZIONE FASCI IONICI" come responsabile del reparto fasci primari.

ATTIVITA': Produzione di fasci ionici sia da sorgenti Sputtering che ECR.
Progettazione di sistemi da vuoto per linee di fascio e per sorgenti.
Coordinamento delle manutenzioni sia meccaniche che elettroniche.
Sviluppo di nuove sorgenti in collaborazione con R&D interna.

Catania 10 MARZO 2020

Salvatore Marletta