

Paolo Mereu

Nato a Cuneo il 27 Novembre 1970

STUDI

Luglio 1996 **Politecnico di Torino:** Laurea in Ingegneria Aeronautica

Ottobre 1996 **Esame di stato** di Abilitazione all'esercizio della professione di Ingegnere.

RUOLI ATTUALMENTE RICOPERTI

- Responsabile del Servizio di Progettazione Meccanica della Sezione dell'INFN di Torino;
- Coordinatore Nazionale del WP3 del Progetto UE BrightnESS2;
- Responsabile della progettazione meccanica del Drift Tube LINAC (DTL) di European Spallation Source (ESS);
- Coordinatore locale del gruppo di lavoro per fornitura DTL di ESS;
- Mechanical System Engineer nella collaborazione IXPE;
- Technical coordinator del Di-Muon Spectrometer dell'esperimento ALICE in LHC;
- Coordinatore locale del gruppo di lavoro per fornitura di Quadrupolo in RadioFrequenza (RFQ) dell'esperimento IFMIF-EVEDA.

ESPERIENZA PROFESSIONALE

- 1996-1997 **Dipartimento di Ingegneria Aeronautica e Spaziale del Politecnico di Torino:** contratto di collaboratore per "Progettazione e sviluppo di una piattaforma bi-rotorica a controllo remoto", in qualità di responsabile delle prove in galleria del vento, della progettazione della trasmissione e dell'analisi di stabilità, nel periodo dal 02/09/1996 al 31/10/1997;
- 1998 **Divisione Tecnica dell'Amministrazione Provinciale di Cuneo – Settore Risorse Idriche:** servizio militare nel periodo dal 12/02/1998 al 09/09/1998;
- 1998- 2000 **Istituto Nazionale di Fisica Nucleare di Torino:** associazione tecnologica con borsa di studio su "Progettazione della struttura meccanica delle camere RPC e del rivelatore ZDC dell'esperimento ALICE" (bando n. 6439/96), nel periodo dal 11/09/1998 al 10/09/2000;
- 2000 **Dipartimento di Fisica Sperimentale dell'Università di Torino:** contratto di collaboratore "Progettazione della struttura meccanica di una stazione di test per rivelatori RPC di grandi dimensioni", nel periodo dal 11/09/2000 al 13/10/2000;
- 2000-2019 **Istituto Nazionale di Fisica Nucleare di Torino:** Tecnologo T3, dipendente INFN a tempo indeterminato, presso il Servizio Progettazione Meccanica della Sezione di Torino;
- 2019 – oggi **Istituto Nazionale di Fisica Nucleare di Torino:** Primo Tecnologo T2, presso il Servizio Progettazione Meccanica della Sezione di Torino.

PUBBLICAZIONI:

- 30 Articoli su rivista;
- 7 Technical Design Report;
- 5 Internal Note / Letter of Intent;
- 39 Proceedings su rivista;
- 2 Capitoli su libro.

CONTRIBUTI A CONFERENZE:

- Maggio 2015 **ALICE Muon Meeting 2015**, Domus de Maria (CA), 25-29 maggio 2015 – membro del comitato scientifico organizzatore (<https://agenda.infn.it/conferenceDisplay.py?confId=9307>);
- Maggio 2016 Presentazione Poster a **7th International Particle Accelerator Conference (IPAC 2016)**, Busan, Korea, "ESS DTL Mechanical Design and Prototyping", (P. Mereu et al.), WEPMB008;
- Maggio 2016 Presentazione Poster a **7th International Particle Accelerator Conference (IPAC 2016)**, Busan, Korea, "Mechanical Integration of the IFMIF-EVEDA Radio Frequency Quadrupole", (P. Mereu et al.), THPMY025;
- Novembre 2016 **Workshop on IKC Best Practice – WP2 BrightnESS**, Bilbao, 14-15 novembre 2016 – invited talk "CAD and Standards in INFN Collaboration Projects"; (<https://brightness.esss.se/in-kind-best-practices/workshop-ikc-best-practice-bilbao>);
- Settembre 2017 Presentazione Poster a **28th International Linear Accelerator Conference (LINAC16)**, East Lansing, Michigan (USA), "Preparation and Installation of IFMIF-EVEDA RFQ at Rokkasho Site", (E. Fagotti et al.), THPLR066.

DESCRIZIONE SINTETICA DELL'ATTIVITÀ INFN

- 1999 - 2010 Tecnologo meccanico **responsabile**, fino al completamento e messa in funzione, del rivelatore di Trigger per lo spettrometro per muoni e dello ZDC dell'esperimento ALICE in LHC, CERN;
- 1999 ad oggi Tecnologo meccanico **responsabile**, fino al completamento e messa in funzione, del rivelatore di Trigger per lo spettrometro per muoni e dello ZDC dell'esperimento ALICE in LHC, CERN; attualmente **Technical Coordinator**;
- 2004 **Progettista** della linea di produzione di Torino delle camere a *drift* per i rivelatori a muoni del *barrel* di CMS;

2007 **Progettista** di sistema meccanico motorizzato per tomografia su manufatti artistici per Centro di Conservazione e Restauro di Venaria Reale;

2008-2010 Tecnologo meccanico **progettista** per sistema a movimentazione motorizzata multi-asse per *test beam* nell'ambito del progetto SLIM5;

2008-2010 Tecnologo meccanico **progettista** nella collaborazione del *Silicon Vertex Tracker* di SuperB;

2008-2010 Tecnologo meccanico **progettista** nella collaborazione del Silicon Tracker di International Linear Collider;

2008 ad oggi **Coordinatore responsabile** del gruppo INFN di Torino per la costruzione della cavità RFQ del progetto IFMIF-EVEDA;

2009 ad oggi **Technical Coordinator** dello spettrometro per muoni dell'esperimento ALICE in LHC;

2009 ad oggi **Technical Coordinator** del sistema ZDC dell'esperimento ALICE in LHC;

2009-2013 **Responsabile** del *WorkPackage* di meccanica del progetto di ricerca neuART "*Neutron and x-ray tomography and imaging for cultural heritage*";

2011-2012 Tecnologo meccanico **responsabile** dei disegni esecutivi del criostato di CUORE e controllo della produzione;

2013 ad oggi **Coordinatore responsabile** del gruppo INFN di Torino per il *Drift Tube LINAC* di *European Spallation Source*;

2013 ad oggi **Responsabile** della progettazione meccanica del *Drift Tube LINAC* di *European Spallation Source*;

2015-2018 **In Kind Field Coordinator** per WP2 e WP6 del Progetto BrightnESS (H2020-INFRADEV-1-2015-1, G.A. n. 676548);

2016 ad oggi **Tecnologo meccanico** in IXPE;

2016 ad oggi **Responsabile** del Servizio di Progettazione Meccanica della sezione di Torino dell'INFN;

2019 ad oggi **Coordinatore Nazionale** per WP3 del Progetto BrightnESS-2 (H2020-INFRADEV-2018-1 G.A. n. 823867).

Torino, 24.03.2020

Paolo MEREU


Curriculum Vitae

Short Bio

Giuseppe Politi, born in Catania (Italy) in 1969, is presently Associate Professor at Dipartimento di Fisica e Astronomia of University of Catania.

He graduated cum laude in Physics in 1992, discussing a thesis on *Complete and Incomplete Fusion in reaction at Tandem Energy*, and obtained the Ph.D. in Physics in 1996, at University of Catania, discussing a thesis on *CHIMERA, a 4pi detector for charged particle for the study of heavy ion collisions at intermediate energies*.

He got a one year post-doctoral fellowship at GANIL - Grand Accelérateur National d'Ions Lourdes in Caen (France) and a two years post-doctoral fellowship for Experimental Nuclear Physics of Istituto Nazionale di Fisica Nucleare (INFN) in Catania.

After a Research Fellowship of Facoltà di Science in the University of Catania, he got in 2000 the position of Assistant Professor in the Dipartimento di Fisica e Astronomia, becoming then Associate Professor in 2011.

He has been Associate Researcher of the INFN since 1992.

He got access in 1998 to the Italian Register of Radioprotection Expert - Second Degree, n. 1853.

Scientific Activity

Giuseppe Politi has been working in the field of experimental Nuclear Physics since 1992, focusing on the investigation of reaction mechanisms in heavy ion collisions from low to the Fermi energies, and on the development of complex detection systems. His activity has been carried at the INFN Laboratori Nazionali del Sud (LNS) in Catania as well as in other laboratories (GANIL - France, GSI - Germany) and within international collaborations involving different European and USA laboratories and institutions.

He began working on the study of complete and incomplete fusion reactions at tandem energies (5 MeV/A) by using a Gas Detector System realized on purpose at the LNS in Catania, and extending the research to higher energies (20 MeV/A) and to different mechanisms as sequential fission of heavy systems.

His Ph.D. was focused on the design and construction at the LNS of the CHIMERA device, a 4pi array for charged particles using different techniques for particle identification, consisting of 1192 telescopes with a Silicon detector and a Tallium doped Cesium Iodide crystal coupled to a photodiode. In particular a technique for the pulse shape analysis of the photodiode signal was developed and successfully used for the first time with large crystals.

During the third year of his Ph.D. and with a following post doc position he worked at GANIL laboratory, still on the study of nuclear reaction at intermediate energies within the INDRA collaboration and also on mass measurement of exotic nuclei by using the cyclotron as a mass spectrometer. He was also invited later a GANIL to collaborate to various experiments in the framework of super-heavy nuclei production by low-energy fusion technique.

He worked then to achieve the realization of CHIMERA apparatus, used in partial and total assembly in the the REVERSE and ISOSPIN campaigns, carried out to study of the isospin effects on dynamical production of fragments, also as a function of the centrality of the collision.

He contributed to the development of a hardware technique to measure the silicon detector rise time in order to use the pulse shape analysis for particle charge discrimination, upgrading the identification capabilities of the CHIMERA device.

He was involved in the new experimental campaigns realized with the CHIMERA detector in the new beam line at LNS and with the newly developed electronics. A first research line continued the study of the isospin and mass dependence of reaction mechanisms and time scale, while a second and new one aimed to study the population and decay of nuclei and resonances at the border of drip lines, searching for exotic decay. This latter task has been pursued by using radioactive beams at

intermediate energies realized at LNS by in line projectile fragmentation, developed in the CHIMERA beam line.

At the same time he collaborated to the ASYEOS experiment, aimed to study the isospin dependence of the asymmetry term of nuclear equation of state at high density, realized at GSI with a part of CHIMERA device coupled to other detectors.

As PI of a PRIN2009 project he coordinated the realization of a prototype of the FARCOS device, a high angular resolution detector array for very precise momentum measurements of light particles and fragments, based on Silicon Strip detector coupled to Cesium Iodide crystals and using a front end electronics realized on purpose by INFN Section of Milano, and a very compact digital data acquisition system (GET). Some prototypes modules have thus been used coupled to CHIMERA in some experiments of the last experimental campaign, for reaction dynamics and nuclear structure studies, in particular for the analysis of correlation between light particles and heavier fragments.

During the last campaign he was also involved in the first experiment attempting with success to use the device for detecting gamma ray coming from monopole resonance of neutron poor nuclei, induced by isoscalar excitation modes.

Finally he is presently involved in the data analysis of some of the last experiments, in finishing the realization of FARCOS modules, in the renewing of CHIMERA Cesium Iodide electronics using a digital acquisition system, and into a new series of tests concerning the study of a new plastic scintillator to be used as neutron detector, with a pulse shape analysis applied to discriminate neutron from gamma rays.

In the last years he also dedicated part of his research activity to the field of applications of nuclear techniques to cultural heritages. He thus participated to different experiments realized in Catania and in the AGLAE laboratory of C2RMF in Paris (France), applying various analytical techniques (PIXE, PIGE, RBS, XrF, TL) for the characterization and/or dating of different ceramic and glass archaeological samples excavated in Sicily.

Scientific Project Coordination:

He was/is involved in the following project/contracts:

- Responsible of the four year (2005-2008) Research Fellowship of Facoltà di Science in the University of Catania, with the subject *Development of isotopic identification with CHIMERA multidetector and study of isospin physics in heavy ion reaction at intermediate energy*, granted to Dr. Elena La Guidara.
- PI, in the period 2008-2012, for the Catania Section of INFN of the EXOCHIM Experiment, a Nuclear Physics Experiment with the goals of i) studying isospin and mass dependence of reaction mechanisms at Fermi energies; ii) studying population and decay of nuclei and resonances at the border of drip lines; iii) studying isospin dependence of asymmetry term of nuclear equation of state at high density.
- PI of the two years (Oct 2011- Sep 2013) PRIN2009 project, protocol n. 2009RLCYL8.
- Responsible of the two years (2010-2012) Research Fellowship of Dipartimento di Fisica of University of Catania, with the subject *Characteristics of nuclear structure and nuclear matter equation of state*, granted to Dr. Paolo Russotto.
- Responsible of the two years (2016-2018) Research Fellowship of Dipartimento di Fisica of University of Catania, with the subject *Study of nuclear dynamics and spectroscopy with high energy and angular resolution measurement with stable and radioactive beams*, granted to Dr. Lucia Quattrocchi.
- PI since 2017 for the Catania Section of INFN of the NEWCHIM Experiment 2015-2019, a Nuclear Physics Experiment devoted to: i) the development of a Femtoscope Array for Correlation and Spectroscopy; ii) the analysis of isospin effects on nuclear reaction dynamics and time scale; iii) the study of nuclear structure, cluster effects and collective resonances.

Scientific Board and Evaluation Activity

He was/is

- Member of the Scientific Board “Area 02 - Physical Sciences” of University of Catania for the periods 2003-2007.
- Member of the board for becoming Assistant Professor at Dipartimento di Fisica in University of Torino (Italy) in 2006 and 2007.
- Member of the board for obtaining PhD in Nuclear Physics on University of Messina (Italy) in 2017.
- President of the board for obtaining Research Fellowship of Istituto Nazionale di Fisica Nucleare Section of Catania, for 2017-2018.
- Chair of the User Committee of Laboratori Nazionali del Sud - INFN since February 2017

Reviewing, Editorial and Organizing Activity

He has been:

- Reviewer for Nuclear Instrument and Method.
- Member of Scientific Committee of the *International Workshop on Multi fragmentation and related topics - IWM*, for the editions: *IWM 2007* - Caen (France), *IWM 2011* Caen (France), *IWM_EC 2014* - Catania, *IWM_EC 2018* - Catania.
- Member of Local Committee of *International Workshop ASYEOS 2012* Siracusa (Italy) and *ASYEOS 2014* Piazza Armerina (Italy).
- Editor of Conf. Proc. SIF, vol 108, “Int. Workshop on Multi facet EOS and Clustering”, IWM-EC 2014.

Publications

He is co-author of more than 130 papers on international peer-reviewed journals and of more than 120 international conference proceedings contributions, some of these as selected oral (15) and invited talks (4).

His h-index is 31, the sum of times cited is more then 2520, as provided by Scopus.

Teaching and supervising activity

Since 2001 he has been teaching in Dipartimento di Fisica e Astronomia in different courses:

- *Nuclear physics laboratory with application on cultural heritage and medicine* (2011 - present)
- *Production techniques of radioisotope for medical applications* (2011 - present)
- *Application of nuclear physics technologies to cultural heritage* (2004 - 2008)
- *General Physics* (2000 - present)

In 2015 he got the course of *Physical Technologies applied to Conservation* in the International Master in Conservation of Antique Photographs and Paper Heritage organized by University of Catania and Helwan University of Cairo (Egypt).

He supervised several Master Scientific Theses and two Ph.D. Theses.



Short CV: C.Vignoli (INFN-LNGS)

1967	Born in Milan, Italy
1993	Degree in Physics, Università degli Studi di Milano (Italy), Particle Physics Thesis
1997	PhD in Physics, University of Pavia (Italy), Particle Physics Thesis
1998 –2008	Staff position as Technologist III level (“Cryogenics and High Vacuum”) at INFN Pavia Section (Italy)
2009 – cont	Staff position as Technologist II level at INFN Gran Sasso National Laboratory (Italy)

Dr. Chiara Vignoli is an elementary particle physicist. She is INFN staff since 1998. She worked in experiments on neutrino interaction, dark matter and double beta decay searches located in the underground Gran Sasso Laboratory (LNGS). She is an expert of vacuum techniques, cryogenic noble liquid detectors and of light collection techniques in scintillators. Her pioneering work on LAr scintillation light detection and two-phase argon chamber development represents a milestone in dark matter searches in the form of WIMP particles involving noble liquids (LAr, LXe).

She got a career upgrade in 2009 for her research results, technical skills and management merits mainly connected to her contribution to the ICARUS project (spokesperson: Nobel Prize Professor C. Rubbia), for the construction and operation of ICARUS 600 t LAr TPC at LNGS, that is the biggest LAr detector ever built. Since 2010 Chiara Vignoli is the Leader of the ICARUS Group at LNGS (up to 11 people) and she was responsible of tenders and contracts for an overall 10 M€ budget. She is IB Member of the short and long baseline neutrino oscillation projects (SBN and DUNE) involving LAr TPC construction in US.

Thanks to complex projects technical coordinator and GLIMOS activity, she became also an expert in safety, infrastructures, logistics, and management issues. For this reason she was appointed as coordinator of a network of the European underground labs on safety and infrastructures in the ILIAS EU Grant.

In 2015 she joined the SABRE Collaboration for the construction of a new NaI(Tl) crystal detector with an active scintillator veto for dark matter searches. She is the INFN leader of the SABRE Italia Collaboration (3 INFN groups plus 2 universities) and the SABRE NORTH Technical Coordinator.

Since 2019 she is also member of GERDA-LEGEND Collaboration.

Participation to experiments:

- ICARUS (1994-cont)
- WArP (1999-2011)
- LBNE/ DUNE (2013-cont)
- SBN @ FNAL (2014-cont)
- SABRE (2015-cont)
- GERDA/LEGEND (2019-cont)

Main past and present roles and responsibilities:

- SABRE Italia Leader (2015-cont)
- SABRE LNGS Group Leader (2015-cont)
- SABRE NORTH Technical Coordinator (2015-cont)
- ICARUS LNGS Group Leader (2010-cont)
- Executive Board Memeber of ICARUS (2010-2018)
- Institution Board Member of SBN (2014-cont)
- Institution Board Member of LBNE/ DUNE (2013-cont)
- LNGS Contract Responsible for ICARUS (2010-cont)
- LNGS Contract Responsible for SABRE (2015-cont)
- ICARUS T600 installation and operation Manager (2004-2013)
- ICARUS T600 cryogenics and Ar purification Manager (2010-2013)
- Member of the INFN National Commission on Training (2010-cont)
- LNGS local representative of INFN Technological Transfer (2017-cont)
- GLIMOS and RAE of ICARUS T600 experiment at LNGS (2001-2015)
- GLIMOS and RAE of WArP experiment at LNGS (2005 – 2011)
- ILIAS FP6 EU Project: Coordinator of N2/DUSL Networking “*Safety Problems and Accident Prevention in Underground Sites*” (WP2) of the 5 European deep underground Labs (2005-2009)
- Experimental Hall Technical Manager of INFN (2001 – 2006)
- Scintillation light detection system Manager (2000-2001)

Main competences:

- Expert of cryogenics, cryogenic noble liquid purification and handling.
- Expert in LAr TPC detectors and LAr scintillation light detection techniques.
- Expert in vacuum plants.
- Technical coordination and management of facilities, complex plants, technical infrastructures and utilities.
- Expert in underground laboratory technical infrastructures, safety and environmental issues.
- Coordination of research groups. Badget managment.
- Tenders and administrative procedures for purchasing orders, RUP, ...
- Participation to several commissions for hiring technical staff.
- Safety and environment issues manager for variuos experiments.
- Technical reviewer of international projects.
- Technological Transfer, Training and Outreach activity for INFN and international activities

Chiare figure,