

Curriculum vitae of

Paolo MONTAGNA

University of Pavia - Department of Physics
INFN Section of Pavia

Personal information: training and working

Born in Pavia on December 31st, 1964.

Resident in Pavia - via De Canistris, 3 - phone 0382 21815.

- 1989: Degree in Physics (experimental nuclear curriculum) at University of Pavia.
- 1989-90: Military service.
- 1991: Post-doc scholarship at INFN Section of Pavia.
Beginning of the research activity in Group III (Nuclear Physics) of INFN Sezione di Pavia.
- 1992-94: PhD in Physics at University of Pavia.
- 1994-97: Annual teaching assignments in Mathematics, Physics and Electronics at various high schools of Pavia and its province.
- 1995-96: Post-Degree Physics Course at Pavia University.
- 1996-98: Three-year collaboration contract with the Department of Nuclear and Theoretical Physics at University of Pavia for the management of computing resources for the departmental research and teaching activities.
- 1996-97: Annual collaboration contract with the Department of Chemistry and Physics of Materials at University of Brescia for the development of reconstruction software for FINUDA experiment (hypernuclear physics, Daphne, Frascati).
- 1998: Researcher at the Faculty of Medicine of the University of Pavia (ssd B01B - Physics, then FIS07 - Applied Physics) since 01/06/1998.
- 2001: Confirmation on role as researcher.

Teaching activity

After a past experience (1994-97) as teacher of Mathematics, Physics, Electronics at various high schools in the province of Pavia, as researcher he held at the University of Pavia (mainly Faculty of Medicine, until 2012), the following courses:

- 1998→2013:
 - Medical Physics supplementary teaching (lectures, laboratory, exercises, exams) for Degree in Medicine and Surgery
- 1999→2001:
 - Physics course for University Diploma for Orthopedics Technicians, Radiology Technicians, Physiotherapists, Dietitians, Technicians of Psychiatric Rehabilitation
- 2001→2012:
 - Medical Physics course for Degrees in Health Technical Professions
- 2001→2011:
 - Preparatory course in Mathematics and Physics for Degrees in Health Technical Professions Techniques
 - Mathematics and Applied Physics course for Degree for Biomedical Laboratory Technicians
- 2003→2013:
 - Medical Physics course for Degrees in Nursing
- 2004→2013:
 - Radioactivity course for Radiology Technicians
- 2004→2007:
 - series of seminars for Modern Physics Teaching course for SILSIS (High School Teaching Post-Degree Courses – Mathematics and Physics area).
- 2012→2013:
 - Physics course for Degree in Science and Technology for the Environment and Nature

To support his teaching activity, in 2003 (and in 2008 a second edition) he published a brief book of Mathematics elements and Physics exercises.

With a talk on its personal teaching experience, he participated to a panel discussion on "A little Physics is good for everybody", organized by Italian Physics Teacher Association (XLIII Congresso Nazionale AIF, 2004).

In 2006-2001 he was tutor of eight thesis for the Degree Course in Techniques of Medical Radiology, Imaging and Radiotherapy, University of Pavia, on issues related to the use of particles and radiation in diagnosis and treatment (particularly hadrontherapy).

From 2004 to 2010 he was coordinator of the educational activities common to the Class of first degrees in Health Technical Professions (see below: "Organization and management activity" for details).

Research activity

His research activity is carried out entirely in the field of experimental nuclear physics at intermediate energies, within the Group III of INFN Pavia.

Are described here briefly the main activities in which he personally contributed in several experiments to which he participated, omitting for brevity the details of individual research and a precise description of the experiments themselves.

The research activity is documented by more than 100 publications, including approximately 70 papers on international journals with anonymous referee, and several communications to conferences, some of which are invited talks. The list of these publications and contributions can be found at <http://inspirehep.net/search?p=find+a+montagna,+p>.

•1991-2003:

OBELIX: Antinucleon-nucleus annihilation at low energies (LEAR-CERN, Ginevra)

He has worked in all phases of the experiment Obelix, and participated in data acquisition over the years 1991-96 with frequent staying at CERN.

In the construction and testing apparatus has participated in the development of programs of pattern recognition and offline reconstruction of the events, and has studied the issues related to the charged particle identification in gas detectors, in particular energy loss for ionization.

The work of physical analysis took place in 1993 as part of a comprehensive analysis of antiproton annihilations on gaseous and liquids targets at rest and in flight at low energy, carried out by the group of Pavia Collaboration. For different channels of reaction antiproton-proton he has personally contributed to various aspects of reconstruction of the events, Monte-Carlo simulation and physical analysis.

Since 1998 he has personally performed an analysis on annihilation at rest of antiproton- ^4He , identifying several exclusive final states, especially with high-momentum nucleons, reflecting an occurred annihilation with the involvement of several nucleons. For these channels he has studied the production of baryonic and mesonic resonances, measuring several absolute branching ratio, not yet measured.

He presented the results of the antiproton- ^4He at an early stage in 2001 at Meson and Light Nuclei Conference, and its subsequent evolution in 2007 at the European Few Body Conference.

•1999-2006:

ATHENA: Anti-hydrogen production (AD-CERN, Ginevra)

From 1999 he began a collaboration with Athena experiment, when the experiment was testing apparatus. He participated to the data acquisition at CERN (2000-04), appearing then one of the authors of the publication in Nature in 2002, which announced for the first time the successful formation and detection of antihydrogen atoms.

Working on some parts of the simulation codes and reconstruction of the events, he wrote some utilities for general data acquisition and helped the analyzes carried out by the Pavia group of Athena Collaboration.

• 2006-08:

FINUDA: Nuclear Physics at Daphne (INFN-LNF, Frascati)

In 2006, he has began a collaboration, launched in 1996 with a contract at the University of Brescia and then interrupted, with the experiment of hypernuclear physics FINUDA, during data acquisition at the National Laboratories of Frascati.

In the period between October 2006 and June 2007 he has therefore participated on several occasions to data acquisition in Frascati, then participating to the work on simulation and analysis of

physical hypernuclear events.

- 2004-12:

PANDA: Strong Interaction with Antiprotons (GSI, Darmstadt)

With the perspective of a wide-ranging activities on meson spectroscopy at GSI in Darmstadt, in which the Group III of INFN Pavia intend to participate, he is one of the authors of the Letter of Intent and Technical Progress Report PANDA experiment.

He began therefore to coordinate, as local coordinator for INFN (2004-12), the activity of the Pavia group, involved from the beginning in Computing and Tracking Group of the experiment.

The contribution of Pavia group consisted in the preparation and management of a new simulation and reconstruction code of a straw tubes tracker, of which the group has taken responsibility in front of the collaboration, and in the development of a code for the simulation and reconstruction of antiproton-proton annihilation events, with particular reference to the tracking of charged particles in the whole magnetic spectrometer. P.Montagna participated in the various phases of work, and dealt in particular, in the simulations on straw tubes detector, resolution studies with different gas mixtures obtained by the package Garfield made at CERN for the simulation of drift chambers.

In April 2011 he was invited to present the scientific program of PANDA experiment to IFAE 11 Conference (Meetings of High Energy Physics).

Organization and management activities

As part of its educational activities, since 2004 he has been appointed as coordinator of educational activities common to the Class of first degrees in Health Technical Professions. For the contribution to the management and organization of these degree programs, he has been appointed Vice-President of Class Degrees and Advanced Degrees of Health Technical Professions, but the nomination was later withdrawn because it has been declared incompatible with the status of researcher to which P.Montagna belongs. Due to this, he was subsequently appointed as Coordinator of the first year of the Class of Degree of Health Technical Professions by the Board of the Faculty of Medicine and Surgery.

For INFN Section of Pavia, since 2004 he is local coordinator of the research activity of PANDA experiment. In June 2011 he was elected coordinator of the scientific line III (Nuclear Physics). He was a member of the Local Organizing Committee of the NPDC19 conference "New trends in nuclear physics applications and technology", organized by the European Society of Physics (Pavia, 2005).

He collaborated in the management and organization and teaching of the traveling exhibition "Nature splits in 4", organized at Pavia in 2009 by INFN Sezione di Pavia.

Since 2009 he is involved in the organizational management of the summer training course for 4th high school's students of the province of Pavia, organized by the Department of Physics.

Divulgation

To complete its educational activities, he has been invited by several schools of the province of Pavia to present the following seminars:

- Accelerators for Health: hadrontherapy - high school "Cairolì" Pavia, 2008, 2010, 2011
- Accelerators for Health: hadrontherapy - high school "Omodeo" Mortara, 2009
- The atom - school "Casorati" Pavia, 2010
- Nuclear energy and its applications - high school science and language "Omodeo" Mortara, 2010
- Nuclear and ...: some examples from Pavia - INFN Prize Filippini - high school students Province of Varese, 2010
- Radioactivity and the biological effects of radiation - high school "Omodeo" Mortara, 2011
- Antimatter and surroundings - high school "Omodeo" Mortara, 2012
- Radiation and life: nuclear energy applications in the medical and social - high school "Copernico" Pavia, 2012

In February 2011, at the invitation of the Foundation Trebeschi of Brescia, has been speaker of the cycle of public meetings "Beyond the atom, where matter and energy are confused" (Brescia, 2011), where he presented the seminar "Radiation and the life: nuclear energy applications in the medical and social." Since 2009, in addition to working in the organizational management, has held several workshops in the summer training courses for 4th high school's students of the province of Pavia, organized by the Department of Physics.

Pavia, August 2013