**Prof. Angelo Pagano**

**Curriculum Vitae**

**Contact**

Prof. Angelo Pagano

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**Area of Expertise**: Nuclear Physics; Experimental physics with Heavy-ions; Fragmentation processes; Time scale of nuclear reactions. Nuclear Instrumentation. Detection. History of Physics.

**Relevant Employment and Educational History**

**Education**

1975 – 1980 Degree in Physics, 110/110 cum laude University of Catania

1980 – 1982 Post Degree-Specialization School in Physics, University of Catania

1983-1984 PhD Student, University of Catania

1987 PHD in physics (ROME) for nuclear physics

**Employment**

3/82 – 12/83 Researcher(CTE) at the CEA-Saclay France

07/84 – 08/84 Researcher(CTE) at the CEA-Saclay France

01/85 – present Permanent Position –Researcher at INFN division of Catania

01/2004-present Research leader –Dirigente di ricerca INFN

11/2007- 05/07/2015 Director of INFN division in Catania

**Prizes and awards**

2010 –‘’Ettore Majorana’’ –Città di Militello (CT)

2012- Permanent member of Accademia Degli Zelanti e dei Dafnci – For Natural science and educational

**Research Interests**

Reaction mechanism in heavy-ion collisions. break-up, Fusion, Fission, Deep inelastic and fragmentation reactions at Coulomb and Fermi energies. Design and Installation of experimental devices for nuclear experiments using Hadronic and Electromagnetic beams delivered by different laboratories (CT, Frascati, Saclay, Ganil, LNS, GSI). In particular, with the installation of the Super Conducting Cyclotron in Catania Angelo Pagano was one of the research leaders of the study group (1990-1993) that devised the novel detector of charged particles, CHIMERA, and he had a decisive role in its implementation and its installation at the South National laboratory in Catania. As ''national responsible'' for the INFN experiments: REVERSE (1998-2003) and ISOSPIN (2003-2008), he faced the first and the second campaign of measurements with CHIMERA, by coordinating a large international collaboration of different laboratories (FR-PO-USA-INDIA-CHINA). He reported at the NuPECC evaluation board in 2003 and at the Nucleus-Nucleus Collision, VIII Int. Conf. (Moscow-2004) about the physics of multi-fragmentation with CHIMERA detector. In the period 2004-2008 he devised (INFN collaboration CT-LNS-MI) the upgrading of the CHIMERA by extending the identification technique with the pulse-shape (PS) method in silicon detector, in order to increase the experimental facility for exotic nuclei. This novel and unique upgrade was completed and fully exploited starting in early 2008 year. Recently, he was promoting an International collaboration aimed to study the Isospin Physics and the behavior of nuclear Symmetry Energy as a function of the nuclear density using GSI H.I. beams with energy around 1GeV/nucleon. He was organizing several Int. workshop in the field of Heavy Ion physics and was member of proceedings editing evaluation boards. He devotes scientific activity in general physics, popular science and environmental science. He organized the dissemination (INFN shows) ‘’balle di Scienze’’ ,Catania 25 February-29 May 2016.

**Publications Summary**

More than 150 published refereed papers and several hundreds of citations, several conference proceedings, several invited lectures at Int. Conferences and at the Italian Physics Society annual meeting.

Organizer/advisory and Co-Editor of several Int. Conferences and Proceedings.

**Selected Research-Related Public Service Positions**

1985-2008 National or local coordinator of different Nuclear Physics experiments (Fission-Flipping-Dracula-CHIMERA/REVERSE/ISOSPIN) in the field of Heavy Ion reaction studies

1986-1988 Representative of the research staff of INFN-Sez. Catania

Since 1990 - Referee in evaluation board of Different PHD thesis of European research Institution (FR,PO..)

Since 1992- Referee of Scientific Journals and/or evaluation committee of Scientific founding agency In Italy, France, UK, USA, PO…

1990 –1994 Coordinating the local activities of the Radiation Protection at INFN –Sez di Catania

1995-2001 Coordinator/representative of nuclear activity(CSNIII) of INFN-Sez di Catania, member of National Board INFN committee for nuclear physics

1995-1998 Member of National INFN Board committee for Astroparticle Physics (CSNII)

2001-2003 Coordinator of Users committee at Laboratori Nazionali del sud (LNS)

Since 1995- Member /or president of evaluation Board in several researcher and technical staff INFN selection

2000 Invited Speaker Svedber Laboratory –Uppsala- at I Int. meeting at TMR/Large – Scale Facility Project ,the Celsius Ring-: perspectives (My, 4th 2000)

2003 Invited Speaker(plenary section) at VIII Nucleus-Nucleus Collisions Int. Conference, Moscow June 17-21 2003

2000- Member of evaluation board Dottorato di Ricerca in Fisica XVI ciclo (D.R. n. 1601 , 28/12/2000) Univ. Messina

2001- Fondatore del ciclo di Conferenze IWM (int. Workshop multifragmentation)-Biennale

2007-2015 member of management INFN Board, as Director of INFN division in Catania

2012- Invited by NUPECC for scientific report contributing paper on CHIMERA activity and publication on ‘’Nuclear Physics. News’’, Int. Journal

2013- Organising committee- XXXIII Congresso Nazionale degli storici della Fisica , Acireale-Catania Siracusa (SISFA)

2015- Member (elected) of Executive board SISFA (Italian Society of History of Physics and Astronomy)

**Summary of Grant income > 10 kEuro**

January 1996 Collaborative Grant NATO CRG 971512 (Participant)

N.22/1999-2001 Collaborative Grant - Fission (atti del XVI prot. di Cooperazione Sci. e Tecnologica ITALIA/Polonia Roma, 16 Dicembre 1998- ministero degli esteri –Team Leader)

2002 PRIN - MIUR contratto COFIN2002 (Participant)

2002-2004 Collaborative Grant NATO PST.CLG.979417(Team Leader)

2009-2013 PRIN - MIUR prog. N. 402 area Fis/01 (Participant)

**Teaching activities -**

**University Teaching**

1985-2005 Evaluation and ‘’esercitatore ‘’ , "Spettroscopia Nucleare'' University of Catania (Physics Department)

1991-1992 Evaluation and ‘’esercitatore’’, "Fisica II" University of Catania ( Mathematics and Informatics Department)

1990-1998 Evaluation and ‘’esercitatore’’ , “Fisica Superiore”, Fisica dell’Ambiente, University of Catania (Physics department)

1993-1998 Evaluation and ‘’esercitatore’’ , ‘’Fisica dell’Ambiente’’, University of Catania (Physics Department)

2010-2011 – Professor under contract ‘’Complementi di Fisica Nucleare’’ 9 CFU Fis04 University of Catania (Physics Department)

2011-2012- Professor under contract ‘’Complementi di Fisica Nucleare’’ 9 CFU Fis04 University of Catania (Physics Department)

2012-2013 – Professor under contract ‘’Fisica degli Ioni Pesanti ’’ 6 CFU Fis04 University of Catania (Physics Department)

2013-2014 – Professor under contract ‘’Fisica degli Ioni Pesanti ’’ 6 CFU Fis04 University of Catania (Physics Department)

2015-2016- Professor under contract ‘’Fisica degli Ioni Pesanti ’’ 6 CFU Fis04 University of Catania (Physics Department)

**Miscellanea /Teaching-Dissemination and Scientific Heritage-**

1985- present -Tutor of several Graduate Thesis and PhD Thesis at University of Catania (Physics Department)

1996 –Coordinator of topical Lectures in Nuclear physics at XIII – Ciclo Dottorato di Ricerca in Fisica

2002-2003 Invited Speaker PON n.1999 IT 05/PO 013 “Langage et Science: Physique et Astronomie” Liceo Scientifico Leonardo da Vinci – Reggio Calabria

2003-2004 Invited Speaker corso IFTS (ISTRUZIONE FORMAZIONE TECNICA SUPERIORE) Consumi Energetici e problema Ambientale di Formazione Superiore per Tecnici di Sistemi Informativi sulle Energie-Rinnovabili codice progetto: 1999.IT.16.1.PO.011/3.07/9.2.14/0127 Ente GESTORE LICEO SCIENTIFICO STATALE "E. MAJORANA" Via Luigi CAPUANA n. 36 - 95048 SCORDIA.

1985-present- Several Invited lectures in local/national Educational Institutions.

Since 2013-present - lecturing at ‘’Università Popolare –Giuseppe Cristaldi’’ –scientific educational

**Postgraduate-level Summer School Teaching**

2010- Invited Lectures and seminars on environmental problems at Physics Department of Caserta University

2012- Invited Speaker-XXII GIORNATE DI STUDIO sui RIVELATORI Scuola F. Bonaiuti Torino, 12-15-Giugno-2012

**Invited by INFN management-in Official INFN delegation**

1995 official speaker at 2nd INFN-RIKEN Symposium Riken (J) May 1995.

2000 Speaker at INFN evaluation Committee ‘’Burton Richter, Volker Soergel e Paul Kienle’’:perspective.

2000 Speaker at NUPECC evaluation Board on ‘’CHIMERA activity’’: Perspectives

2003 Speaker at INFN evaluation Committee ‘’ F. Iachello’’Catania LNS (24-ottobre 2003).

2004 official speaker at 5th INFN-RIKEN Symposium Naples, Italy, 3 – 7 November 2004

2015-2016 INFN member of scientific committee organization ‘’Balle di scienze’’ held in Catania 25 February-29 May 2016

**Professional Affiliations**

Italian Society of Physics(SIF)-

Italian Society History of Physics(SISFA-member of Executive board))

**List of selected refereed publications**

1-M. Baldo,G. Lanzanò, A. Pagano, A. Palmeri, S. Aiello, G. Piccitto, Y.Cassagnou, R. A. Dayras, J. Fouan and L. Rodriguez "Neutron Emission from the Compound Nucleus 26Al" Phys. Lett. B vol. 156, N.3,4 (1985) 181-184.

2-R. Dayras, A. Pagano, J. Barrette, B. Berthier, D. M. De Castro Rizzo,E. Chavez, O. Cisse, R. Legrain, M. C. Mermaz, E. C. Pollacco, H. Delagrange, W. Mittig, B.Heusch, R. Coniglione, G. Lanzanò, A. Palmeri "Peripheral Interaction for 44 MeV/u 40Ar on 27Al and natTi targets" Nucl. Phys. A 460 (1986) 299-323.

3- S. Lo Nigro, S. Aiello, G. Lanzanò, C. Milone, A. Pagano, A. Palmeri and G. S. Pappalardo, V. Lucherini, N. Bianchi, E. De Sanctis, C. Guaraldo, P. Levi-Sandri, V. Muccifora, E. Polli, A. R. Reolon and P.Rossi " Fragment Mass and Kinetic Energy distributions for the Photofission of 238U with (100-300)MeV Bremsstrahlung" Nuovo Cimento A 98 (1987) 643- 656.

4- G.Lanzanò, A. Pagano, S. Urso,E. De Filippo,B. Berthier,J.L.,Charvet,R.Dayras,R. Legrain,R. Lucas,C. Beck,B. Djerroud "Using BaF2 Crystals as detectors of light charged particles at intermediate energies'' Nucl. Instr. and Meth. A312, 515-520 (1992)

5- A. Pagano, S.Aiello, E. De Filippo, G. Lanzanò, S. Lo Nigro, C .Milone and M.C. Mermaz " Angular correlations of projectilelike and fission fragments in the reaction 16O + 238U at 110 MeV'' Phys. Rev. C 50 N.2 (1994) 891-896.

6- A.Pagano, "A new multi element detector system at LNS for heavy ion reaction studies at intermediate energies" Plenary Invited Lecture selected 2nd INFN-RIKEN Symposium INFN 1995 Committee - Riken (J) May 1995.Pub. in Perspectives in Heavy-ion Physics ed. M. Ishiara, T. Fukuda, C. Signorini World Scientific Pub. Co. Ltd. (1995)

7- G.Lanzanò, A.Pagano, G. Blancato, E. De Filippo, M. Geraci, R. Dayras, B. Berthier, F. Gadi-Dayras, R. Legrain, E.Pollacco. “Inclusive measurements of light charged particles emitted in the reaction 40Ar + 27Al at 60 A.MeV” Phy. Rev. C. Vol. 58, n.1, 281, July (1998).

8- C. Beck, …A.Pagano, Eur. Phys. J. A 2, 281-293 (1998)

9- A.Pagano, ‘’ Physics with the Chimera detector at LNS in Catania: The REVERSE experiment’’ Plenary Invited Lecture selected by 3rd Int. Relativistic Ion Studies CRIS 2000 - Acicastello Italy, May –2000. Pub. In A.Pagano Nucl. Phys A681(2001)331

10-M.Consoli, A.Pagano and L.Pappalardo ‘’; Vacuum condensates and ‘ether-drift’ experiments’’, Physics Letters A 318 (2003) 292-299

11- A. Pagano et al., ‘’ Fragmentation studies with the CHIMERA detector at LNS in Catania: recent progress’’, Nuclear Physics A734 (2004) 504-511.

12- E. De Filippo,….A. Pagano, Eur. Phys. J. A (2004) 21: 169-174

13-E.De Filippo,…A.Pagano, PRC 71, 044602 (2005)

14- E.De Filippo,…A.Pagano, PRC 71, 064604 (2005)

15- R. T. de Souza, N. Le Neindre, A. Pagano and K. -H. Schmidt, Eur. Phys. J. A (2006) 30: 275-291

16- E. De Filippo, ….,A. Pagano, Eur. Phys. J. A (2007) 32: 349-356

17- I. Skwira-Chalot , ….A.Pagano, et. al. Phys. Rev. Letters 101, 262701 (2008).

18- W. Trautmann,…A.Pagano , et al. Progr. in Part. and Nuclear Physics 62 (2009) 425–426.

19-F. Amorini,…A.Pagano et al., Phys. Rev. Letters 102, 112701 (2009)

20- F.Amorini,…A.Pagano et al., IEEE Trans. On Nucl. Science 56, 2519-2523 (2009).

21- J. Wilczy´nski,…A.Pagano, et al., PRC 81, 024605 (2010).

22- P. Russotto,…A.Pagano, et al., Phys. Rev. C81, 064605 (2010).

23- I.Lombardo,…A.Pagano, et al., Phys. Rev. C82, 014608 (2010).

24- Z. Sun,…A.Pagano, et al., Phys. Rev. C82, 051603 (2010).

25-A.R. Raduta,..A.Pagano, et al. Phys. Lett. B705, 65 (2011).

26-De Filippo E, Pagano A., et al. Phys. Rev C86, 014610 (2012).

27-A.Pagano, Nuclear Physics. News Int., vol. 22, No 1, 28-33 (2012).

28- E. De Filippo and A. Pagano Eur. Phys. J. A (2014) 50: 32

**Selected paper in History of Science, dissemination and environmental problem**

1-A. Nigro, A. Pagano, and F. Zuccarello, ‘’Global warming: solar variability and energy

Consumption’’, Mem. S.A.It. Vol. 76, 1015c SAIt 2005

2- G. Boscarino, S.Notarrigo, A.Pagano, ‘’Geometria e Fisica’’, pub. In Atti Convegno Nazionale su Peano e i Fondamenti della Matematica, Modena, 22-24 Ottobre (1991).

3- P. Di Mauro, S. Notarrigo, A.Pagano “ Riesame della teoria di Augusto Righi sull’apparato dell’esperimento di Michelson - Morley” Quaderni di storia della Fisica –2- (1997)101-110 Il giornale di Fisica del IL Nuovo Cimento 14- A.Pagano, ‘’sul concetto di probabilità classica’’. Giornale di Fisica del IL Nuovo Cimento Vol. 43, N.2 Aprile – Giugno (2002) pp.99-104

4- A.Pagano, ‘’Probabilità: assiomatiche a confronto ’’. Giornale di Fisica - IL Nuovo Cimento, Ottobre-Dicembre (2003), pp.251-256

5- A.Pagano, ‘’ La questione ambientale e il mito dello sviluppo economico illimitato’, in ‘’Ettore Majorana nel centenario della Nascita’’ , La Biblioteca di Francesco Branciforte, Edizioni Novecento, suppl. della rivista ‘’La terrazza’’, Organo del Museo e archivio comunale Sebastiano Guzzone di Militello Val di Catania, N.1 gennaio-giugno 2007.

6- A. Pagano, ‘’Teoria fisica e modelli concreti in Democrito’’; Quaderni CE.R.CO, Atti XXVII Congr. Naz. SISFA-2007- a cura di E.Giannetto, G.Giannini e M.Toscano, pag. 33.

7- A. Pagano,’’ Lo sviluppo tecnologico, la scienza ed il sistema economico’’; atti XXX Congr.Naz. SISFA-2010-Urbino

8- A. Pagano, ‘’ Biografia di Salvatore Notarrigo’’, Biografia su invito su ‘’Biografie TRECCANI’’.

9- A.Pagano, ‘’Fisica dei corpi solidi’’, atti XXXI Congr. Naz. SISFA-2011 –Pavia

10- A.Pagano,P.Di Mauro, ‘’ A historical criticism to Lorentz transformation in special relativity’’, atti XXXV Congr. Naz. SISFA 2015- Arezzo