



I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Fisica Aldo Pontremoli dell'Università degli Studi di Milano**

Scientist- in - charge: **Dott.ssa Rosanna Depalo**

Giulia Gosta - CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Gosta
Name	Giulia

PRESENT OCCUPATION

Appointment	Structure
Post doc	INFN-Pavia

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree	Physics LM-17	Università degli Studi di Milano	2017
Specialization			
PhD	Physics	Università degli Studi di Milano	2020
Master			
Degree of medical specialization			
Degree of European specialization			
Other			



FOREIGN LANGUAGES

Languages	level of knowledge
English	B2

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2020	Second price for the best communication SIF 2020

TRAINING OR RESEARCH ACTIVITY

My research activity is related to experimental nuclear physics and particle physics and is summarized in the following:

Activities in bachelor degree:

In my bachelor thesis, I focused on the measurement of the energy spectrum of the electron emitted in the β -decay of the ^{138}La , which was the second dedicated measurement ever done so far. The β -continuum spectrum of the ^{138}La has been measured using two 3"×3" $\text{LaBr}_3:\text{Ce}$ detectors in coincidence and two different data acquisition systems. The first uses both analog and digital electronics while the second only digital electronics. The results confirm the discrepancy between the experimental data and the theoretical prediction of the β -energy spectrum in the case of a second-order forbidden transition.

Activities in master degree:

During the master thesis, I worked on the response function of scintillator detectors. In particular, I measured the response function of two scintillator detectors (each consisting of a 3.5" × 8" large volume $\text{LaBr}_3:\text{Ce}$ crystal) to almost monochromatic gamma rays with energy ranging from 6 to 38 MeV produced in the NewSUBARU facility (Osaka, JP). Each crystal was coupled to two different PMT's of the same type so that four spectra were recorded for each beam energy. I investigated the linear behavior of the crystal, of the PMT together with the Voltage Divider and the electronics used to handle the signals in independent way. This analysis was used to identify the origin of possible non-linearity effects.

Activities in PhD:

The isospin symmetry does not hold for the Coulomb interaction between protons in the nucleus. This leads to a breaking of the symmetry which induces a mixing between states with different values of isospin. This phenomenon is called isospin mixing and was measured in the $N=Z$ nucleus ^{60}Zn . The experiment was performed at Laboratori Nazionali di Legnaro (LNL) where the nucleus ^{60}Zn was formed by the fusion-evaporation reaction $^{30}\text{Zn} + ^{28}\text{S}$. The isospin mixing coefficients, at two temperatures $T=2$ MeV and $T=2.4$ MeV, were extracted from statistical model analyses of the E1 emission which should be forbidden for the selection rules of the symmetry. In this project I deal with the preparation of the experiment, the assembly of the experimental setup, the data analysis and the simulations.

Extra Activities :

During my PhD I performed measurements on the liver and kidney tissue samples from Imane Fadil (33-year-old Moroccan model) to verify the presence of radioactive substances contamination.



PROJECT ACTIVITY

Year	Project
2021	ASACUSA: The main goal of the ASACUSA-CUSP group is to measure the hyperfine splitting of the ground state (HFS-GS) of antihydrogen using an atomic spectroscopy beamline at the CERN's Antiproton Decelerator (AD) to perform a test of the fundamental CPT symmetry between matter and antimatter. During the first year of Post-doc, I performed the upgrade of the scintillator detectors for the measurement of the antiproton annihilation.
2022	bSMILE: This project proposes to study coherent elastic neutrino-nucleus scattering (CEvNS) with neutrinos produced by the interaction of an intense 11 GeV energy electron beam with the dump in a fixed target experiment (vBDX). My work regards simulations, obtained through GEMC tool, aim to define the best way to shield the low-threshold detector from background where two main sources are considered: neutrons and muons from cosmic rays and neutrons coming from the dump.
2023	Pontecorvo: At least two mesons are produced in the annihilation of an antiproton with a single nucleon into hadrons. However, reactions associated with only one or no meson in the final state are possible. Annihilation which is not accompanied by the emission of even a single meson is possible only in the collisions of an antinucleon with a nucleus of atomic mass $A \geq 3$. These processes are called Pontecorvo reactions. During my last year of Post-doc, I performed simulations using the GEMC tool in order to determine the experimental apparatus for a possible measurement of the Pontecorvo reaction $\bar{p} + {}^3\text{He} \rightarrow p + n$.

CONGRESSES AND SEMINARS

Date	Title	Place
February 2018	IVth Topical Workshop on Modern Aspect in Nuclear Structure	Bormio, Italia
August 2018	Zakopane conference on NUCLEAR PHYSICS	Zakopane, Poland
October 2018	The 6th International Conference on Collective Motion in Nuclei under Extreme Conditions (COMEX6)	Cape Town-South Africa
February 2019	One day workshop on New Vistas on Nuclear Dynamics: Shapes, Spin and Isospin	UNIMI
March 2019	AGATA@LNL for stable Beam	LNL, Legnaro, Italy
September 2019	Mazurian Lakes Conference on Physics	Piaski-Polonia
September 2019	105° Congresso Nazionale SIF	Aquila-Italia
November 2019	PARIS Collaboration Meeting	LNL, Legnaro, Italy
February 2020	Vth Topical Workshop on Modern Aspects in Nuclear Structure	Bormio-Italia
September 2020	106° Congresso Nazionale SIF	UNIMI
September 2021	International conference on exotic atoms and related topics (EXA 2021)	Online



SUMMER SCHOOL

Date	Title	Place
September 2016	Euroschool on Exotic Beam 2016	Mainz, German
July 2017	Rewriting nuclear physics textbooks: Basic nuclear interaction and their link to nuclear process in the cosmos and on earth	Pisa, Italy
March 2018	FNHP2018 Frontiers in Nuclear and Hadronic Physics	Firenze, Italy
August 2019	Euroschool on Exotic Beam 2019	Aarhus-Denmark

PUBLICATIONS

Articles in reviews - key publication (for all publications see attached pdf)
A. Giaz, G. Gosta et al. "Measurement of β -decay continuum spectrum of ^{138}La " <i>EPL</i> , 110 (2015) 42002
G. Gosta et al. "Response function and linearity for high energy γ -rays in large volume $\text{LaBr}_3:\text{Ce}$ detectors" <i>NIMA-D-17-00616</i> (2017)
G. Gosta et al "Probing Isospin mixing with the Giant Dipole Resonance in the ^{60}Zn compound Nucleus" <i>Phys. Rev. C</i> 103, L041302 (2021)
A. Goasduff et al. "The GALILEO γ -ray array at the Legnaro National Laboratories" <i>Nuclear Inst. and Methods in Physics Research, A</i> 1015 (2021) 165753
G.Costantini, G.Gosta et al. "The upgrade of the ASACUSA scintillating bar detector for antiproton annihilation measurements " 2023 <i>JINST</i> 18 P04013
G.Costantini, G.Gosta et al. Upgrade of the scintillator detector for particle tracking in experiments with antiprotons <i>INTERNATIONAL JOURNAL OF MODERN PHYSICS A</i> (2023)

Congress proceedings
G. Gosta "Study of the Isospin Symmetry in ^{60}Zn " <i>Acta Physica Polonica B</i> (2019)
G. Gosta "ISOSPIN SYMMETRY IN THE ^{60}Zn NUCLEUS" <i>Acta Physica Polonica B</i> (2020)
G. Costantini , G.Gosta et al. "Upgrade of the scintillating bars detector for the ASACUSA experiment" <i>International Conference on Exotic Atoms and Related Topics - EXA2021</i>

OTHER INFORMATION

<ul style="list-style-type: none">From 2018 to 2020 tutoring and examination at the Physics course at the department of PharmacyFrom 2020 to 2023 tutoring and examination at the Physics course at the department of Information engineering
Digital skills: C++, ROOT, gemc simulation tools, Latex, MATLAB, Origin software (Data analysis and Graphing software), Office suite

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.



UNIVERSITÀ DEGLI STUDI DI MILANO

Please note that CV WILL BE PUBLISHED on the University website and It is recommended that personal and sensitive data should not be included. This template is realized to satisfy the need of publication without personal and sensitive data.

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Place and date: ___Milano_____, ___1/12/2023_____