GIULIA PAGGI

Ph.D. Student of Nuclear and Subnuclear Physics

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EDUCATION

Ph.D. in Physics

Alma mater studiorum - Università di Bologna

2022 – ongoing | Bologna, Italia

- **Researh theme**: Muon identification within a large hadronic background, and application for tagging neutrino interactions in SND@LHC at LHC and for the CMS muon trigger at HL-LHC.
- **Currently working** on CMS L1 trigger Phase 2 upgrade, SND@LHC neutrino search with the electronic detector

Master degree in Physics

Alma mater studiorum - Università di Bologna

2020 – 2022 | Bologna, Italia

- **Grade**:110/110
- **Thesis**: "Construction and test of a cosmic ray telescope based on CMS Drift Tube chambers and data acquisition prototypes of the Phase-2 upgrade"
- Commissioning of two small replicas of CMS DT chambers, called MiniDTs, built at INFN National Laboratory in Legnaro, which were then brought to Bologna to build a cosmic rays telescope
- Development of the data taking online monitor to check in real-time the status of the MiniDTs and data quality
- Software analysis to reconstruct tracks using hits from the two MiniDTs to assess their performances and study the Phase-2 readout electronics performance
- The results were presented at the 108° National Congress of the Italian Physical Society
- **Class**: LM-17 Physics

Bachelor degree in Physics

Alma mater studiorum - Università di Bologna

2017 – 2020 | Bologna, Italia

- **Grade**:107/110
- **Thesis**: "Sviluppo di un algoritmo di trigger per la ricerca di particelle esotiche a lunga vita media a High Luminosity LHC con il rivelatore di muoni di CMS"
- Original research work in the context of HL-LHC upgrade. A study of a trigger algorithm to select Heavy Stable Charged Particles using a simulation of the CMS Phase-2 detector.
- By exploiting the improved time resolution of the Phase-2 DT trigger, a method was designed to identify the bunch crossing of collisions that originated slow-moving particles which reach the muon system with a significant delay.
- Combining the current prompt trigger algorithm and the proposed one, the acceptance for the HSCP increases from 67.4% to 93.4%, extending the sensitivity of the baseline trigger, limited to $\beta \equiv v/c \geq 0.7$, to values of β as low as ~ 0.35, while achieving an overall efficiency per particle above 90%.
- **Class**: L-30 Physics

TEACHING EXPERIENCE

Tutor

Alma mater studiorum - Università di Bologna

2022 - ongoing | Bologna, Italia

- Teaching support for the Nuclear and Subnuclear Laboratory 2 course in the Physics master degree program.
- Tasks include support to the students during the laboratory experience, reception and counselling for students.

Tutor

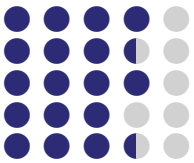
Alma mater studiorum - Università di Bologna

A.a. 2021/22 | Cesena, Italia

- Teaching support for the physics course in the Computer Science and Engineering bachelor degree.
- Tasks include frontal teaching lessons, reception and counselling for students, and support for the professor during the exams.

PROGRAMMING

C++
LabVIEW
LaTeX
Python
ROOT



LANGUAGES

Italian
English

PROJECTS

International School of Subnuclear Physics

INFN

14-23 Jun 2023 | Erice, Italia

- 59th Course: "Searching the unexpected: energy, luminosity, precision, small signals"

MLHEP

INFN

11-18 Apr 2023 | Erice, Italia

- School focused on data analysis and computational research ML application in High Energy Physics.

EDUCATION

High school

Liceo Classico e Musicale Annibale Mariotti

2013-2017 Perugia, Italia

POSTERS AND CONFERENCES

Talk

109° SIF national congress

11 - 15 Sep 2022 Salerno, Italia

- **Title:** "Observation of high-energy muon neutrinos with the SND@LHC experiment"
- Parallel talk to present the latest result of the SND@LHC collaboration.

Poster

CMS Upgrade days

6 - 8 Feb 2023 CERN, Geneva, Switzerland

- **Title:** "A cosmic ray telescope based on Drift Tubes for the test of electronic prototypes of the CMS Muon Barrel Phase-2 Upgrade"
- Presented thesis work during the poster sessions

Talk

108° SIF national congress

12 - 16 Sep 2022 Milano, Italia

- **Title:** "Construction of a cosmic-ray telescope with small-scale CMS Drift Tubes Chambers"
- Parallel talk to present the master thesis work.
- Classical High School Diploma
- **Grade**: 100/100

PROJECTS

Thesis Internship

Alma mater studiorum - Università di Bologna

2022 Bologna, Italia

- Laboratory activities aimed at the construction and commissioning of a cosmic ray telescope. Software development for data readout, online monitoring and offline analysis.

Summer Student at Fermilab and other US Laboratories

Università di Pisa

2021 LNF, Frascati, Italia

- Topical workshop about ongoing and future particle physics experiments planned at Fermilab and related technological improvements

CERTIFICATES

Academic IELTS

02/2020

- **Overall band score**: 8.0
- **CERF level**: C1

Certified LabVIEW Associate Developer

03/2019

PUBLICATIONS

Research Paper

The CMS statistical analysis and combination tool: COMBINE

2024

- **URL:** https://arxiv.org/abs/2404.06614

Research Paper

Searches for pair-produced multijet resonances using data scouting in proton-proton collisions at $\sqrt{s}$= 13 TeV

2024

- **URL:** https://arxiv.org/abs/2404.02992

Research Paper

Searches for Higgs boson production through decays of heavy resonances

2024

- **URL:** https://arxiv.org/abs/2403.16926

Research Paper

Enriching the physics program of the CMS experiment via data scouting and data parking

2024

- **URL:** https://arxiv.org/abs/2403.16134

Research Paper

Observation of the J/$\psi\to\mu^+\mu^-\mu^+\mu^-$ decay in proton-proton collisions at $\sqrt{s}$ = 13 TeV

2024

- **URL:** https://arxiv.org/abs/2403.11352

Research Paper

Search for soft unclustered energy patterns in proton-proton collisions at 13 TeV

2024

- **URL:** https://arxiv.org/abs/2403.05311

Research Paper

Search for long-lived heavy neutrinos in the decays of B mesons produced in proton-proton collisions at $\sqrt{s}$ = 13 TeV

2024

- **URL:** https://arxiv.org/abs/2403.04584

Research Paper

Measurement of the muon flux at the SND@LHC experiment

2024

- **URL:** https://arxiv.org/abs/2310.05536

Research Paper

Observation of collider muon neutrinos with the SND@LHC experiment

2023

- **URL:** https://arxiv.org/abs/2305.09383