

# Europass

## Curriculum Vitae



*Dichiarazione sostitutiva di certificazione e dichiarazione sostitutiva dell'atto di notorietà ai sensi del D.P.R. 445/28.12.2000*

La sottoscritta ILARIA PANICHI nata a [REDACTED] residente in [REDACTED] consapevole delle responsabilità penali cui può andare incontro, in caso di dichiarazioni mendaci, ai sensi e per gli effetti di cui all'art. 76 del D.P.R. 445/2000 e consapevole che, ai sensi dell'art. 13, del Regolamento UE 2016/679 (GDPR), la presente dichiarazione sarà pubblicata sul sito web dell'amministrazione in apposita sezione di Amministrazione Trasparente, sotto la propria responsabilità, dichiara ai sensi degli art. 46 e 47 del DPR 445/2000

### Personal information

Name / Surname

**Ilaria, PANICHI**

Personal Email

[REDACTED]

Nationality

[REDACTED]

Date of birth

[REDACTED]

Gender

[REDACTED]

### Work experience

Dates

September 1st, 2023 - August 31th, 2024

Occupation or position held  
Name and address of employer

CERN Associated Doctoral Student

Organisation européenne pour la recherche nucléaire CERN, CH-1211 Genève 23, Suisse

Type of business or sector

Kaon physics, hidden sector searches, RICH detectors

Dates

November 11th, 2021 - today

Occupation or position held  
Name and address of employer

Scientific affiliation to INFN Firenze

INFN - Istituto Nazionale di Fisica Nucleare, Sezione Firenze - Via Bruno Rossi, 1, 50019 Sesto Fiorentino FI, Italy

Dates

November 1st, 2021 - today

Occupation or position held  
Name and address of employer  
Type of business or sector

Ph.D. student

Università degli Studi di Firenze - UniFI, P.zza S.Marco, 4 - 50121 Firenze, Italy

Nuclear and subnuclear physics - Settore Scientifico Disciplinare FIS/04 Fisica Nucleare e Subnucleare.

|  |  |
|--|--|
| Other  | <p>For my bachelor's and master's thesis works, I joined an international research group, the CERN NA62 Collaboration, cooperated with people from different countries and participated to collaboration meetings, where I presented the development of my works.</p>  |
|  | <p>As a Ph.D. student I became part of the NA62 Collaboration, <b>the main person in charge of</b> the physics analysis that I started during my master's thesis, the search for dark matter mediators <math>X</math> in the decay <math>K^+ \rightarrow \mu^+ \nu_\mu X, X \rightarrow \gamma\gamma</math> at NA62, and, starting from January 2022, <b>responsible for</b> the data quality of the NA62 RICH detector. During the 2022-2023 and 2024 run periods, I actively participated to the NA62 data taking as a shifter and as on-call expert of the RICH detector, and in 2024 (September 11th to 25th) I was chosen as one of the run coordinators.</p> |
|  | <p>In April 2023 I was <b>tutor of</b> a bachelor student from Università degli Studi di Firenze during her thesis work period in NA62. In 2024 I was <b>supervisor of</b> a CERN summer student, Eleonora Pariset, working on the data analysis project <i>Search for an axion light particle in the flavor violating <math>K^+ \rightarrow \pi^+ \pi^0 a</math> decay at the NA62 experiment</i></p>   |
| <b>Education and training</b>                                  |  |
| Dates  | November 1st, 2021 - today   |
| Principal subjects/Occupational skills covered                 | Ph.D. Scholarship - XXXVII ciclo di Corsi di dottorato presso l'Università degli studi di Firenze  |
| Name and type of organization providing education and training | Data analysis in high energy physics; experimental particle physics  |
| Dates  | Università degli Studi di Firenze, IT  |
| Title of qualification awarded                                 |  |
| Principal subjects/Occupational skills covered                 | September 2018 to July 2021  |
| Name and type of organization providing education and training | Master's degree in Physics and Astrophysics - Laurea Magistrale in scienze Fisiche e Astrofisiche (Classe LM-17). Score: 110/110 cum laude   |
| Dates  | Nuclear and Subnuclear Physics   |
| Title of qualification awarded                                 | Università degli Studi di Firenze, IT  |
| Principal subjects/Occupational skills covered                 | September 17th - October 1st, 2017   |
| Name and type of organization providing education and training | Scholarship for experimental activities at CERN aiming at thesis work for physics bachelor's students of Università degli Studi di Firenze (founded by Università degli Studi di Firenze)  |
| Dates  | data analysis activities at CERN NA62 experiment   |
| Title of qualification awarded                                 |  |
| Principal subjects/Occupational skills covered                 | September 2014 to April 2018   |
| Name and type of organization providing education and training | Bachelor's degree in Physics and Astrophysics - Laurea Triennale in Fisica e Astrofisica (Classe L-30). Score: 108/110   |
| Dates  | Physics and Astrophysics   |
| Title of qualification awarded                                 | Università degli Studi di Firenze, IT  |
| Principal subjects/Occupational skills covered                 | September 2009 to July 2014  |
| Name and type of organization providing education and training | High school Leaving Certificate. Score: 100/100  |
| Dates  | High school studies with a specialisation in science   |
| Title of qualification awarded                                 | Liceo Scientifico P.Gobetti, Bagno a Ripoli, Firenze, IT   |
| Principal subjects/Occupational skills covered                 |  |
| Name and type of organization providing education and training |  |

## Personal skills and competences

Mother tongue  
Other language(s)  
Self-assessment  
European level<sup>(\*)</sup>  
  
English  
French

## ITALIAN

| Understanding |             | Speaking           |                   | Writing    |
|---------------|-------------|--------------------|-------------------|------------|
| Listening     | Reading     | Spoken interaction | Spoken production |            |
| proficient    | proficient  | proficient         | proficient        | proficient |
| independent   | independent | basic              | basic             | basic      |

<sup>(\*)</sup>Common European Framework of Reference (CEF) level

## Certificates

**French:** Diplôme d'études en langue française DELF B2, May 2012; CEF level B2  
**English:** Cambridge English: First Certificate in English (FCE), March 2013; CEF level B2

## Computer skills and competences

SO  
Programming languages  
Software and Applications

Windows, Unix/Linux, macOS

Python, C/C++

Microsoft Office, CERN ROOT (RooFit and RooStat included), L<sup>A</sup>T<sub>E</sub>X

## Participation to National and International Schools

Dates  
Principal subjects/Occupational skills covered

The Eighth Machine Learning in High Energy Physics - Summer school 2023  
April 11th to 18th 2023

Formulate a High Energy Physics-related problem in Machine Learning-friendly terms; select quality criteria for a given problem; understand and apply principles of widely-used classification models (e.g. boosting, bagging, BDT, neural networks, etc) to practical cases; optimise features and parameters of a given model in efficient way under given restrictions; select the best classifier implementation amongst a variety of ML libraries (scikit-learn, xgboost, deep learning libraries, etc); understand and apply principles of generative model design; define and conduct reproducible data-driven experiments.

INFN, Practicum and Ettore Majorana Fondation and Center for Scientific Culture

Name and type of organization providing education and training

Dates  
Principal subjects/Occupational skills covered

GGI School - Frontiers in Nuclear and Hadronic Physics 2022

February 21th to March 4th 2022

Hadron Exotic Spectroscopy and Deep Inelastic Scattering Phenomenology (Nucleon partonic structure: concepts and measurements, Physics of multiquark states, The multidimensional structure of the nucleon); Axions as dark matter candidates; Strangeness in hadron collisions, spectroscopy and compact stars.

The Galileo Galilei Institute for Theoretical Physics, Centro Nazionale di Studi Avanzati dell'Istituto Nazionale di Fisica Nucleare

Name and type of organization providing education and training

## Participation to National and International Conferences

|                |  |
|----------------|--|
| Date and Place | IFAE2024 - Incontri di Fisica delle Alte Energie 2024  |
| Contribution   | April 3rd-5th, 2024, Firenze, Italy<br>Talk: <i>Nuovi risultati dalle analisi dei decadimenti rari dei <math>K</math> e dei <math>\pi</math> all'esperimento NA62</i> ( <a href="https://agenda.infn.it/event/38127/contributions/226940/">https://agenda.infn.it/event/38127/contributions/226940/</a> )                                    |
| Date and Place | EPS-HEP 2023 - European Physical Society Conference on High Energy Physics   |
| Contribution   | August 21th-25th, 2023, Hamburg, Germany<br>Parallel talk: <i>Searches for LF/LN violation and hidden sectors in kaon decays at the NA62 experiment</i> ( <a href="https://indico.desy.de/event/34916/contributions/147313/">https://indico.desy.de/event/34916/contributions/147313/</a> )  |
| Date and Place | NePSI23 - The 1st International Workshop on New Physics Signals  |
| Contribution   | September 15th - 17th, 2023, Pisa, Italy ( <a href="https://agenda.infn.it/event/32931/">https://agenda.infn.it/event/32931/</a> )<br>Poster: <i>Search for Lepton Flavor and Lepton Number violating decays at NA62</i>   |
| Date and Place | 108° Congresso Nazionale SIF   |
| Contribution   | September 12th - 16th, 2022, Milano, Italy<br>Talk - Comunicazione: <i>Ricerca di mediatori di materia oscura nel decadimento raro <math>K^+ \rightarrow \mu^+ \nu_\mu X, X \rightarrow \gamma\gamma</math> con il rivelatore NA62 al CERN</i> ( <a href="https://2022.congresso.sif.it/talk/98">https://2022.congresso.sif.it/talk/98</a> ) |
| Date and Place | VCI2022 - The 16th Vienna Conference on Instrumentation  |
| Contribution   | February 21th - 25th, 2022, online ( <a href="https://vci2022.hephy.at">https://vci2022.hephy.at</a> )<br>Recorded presentation <i>High level performance of the NA62 RICH detector</i> ( <a href="https://indico.cern.ch/event/1044975/contributions/4663797">https://indico.cern.ch/event/1044975/contributions/4663797</a> )              |

## Publications

|                   |  |
|-------------------|--|
| Conference papers | I.Panichi on behalf of the NA62 Collaboration, <i>High level performance of the NA62 RICH detector</i> . Published in: Nucl. Instrum. Methods Phys. Res., A 1045 (2023) 167583, contribution to: VCI2022. DOI:10.1016/j.nima.2022.167583 |
|                   | C.Biino on behalf of the NA62 Collaboration, <i>New measurement of radiative decays at the NA62 experiment at CERN: <math>Ke3\gamma</math></i> . Published in: PoS(DISCRETE2020-2021)055, DOI:10.22323/1.405.0055                        |
|                   | R.Volpe on behalf of the NA62 Collaboration, <i>Search for <math>K^+</math> decays to a lepton and invisible particles</i> . Published in: PoS(DISCRETE2020-2021)056, DOI:10.22323/1.405.0056  |
|                   | J.Swallow on behalf of the NA62 Collaboration, <i>Searches for lepton flavour/number violation in <math>K^+</math> and <math>\pi^0</math> decays at the NA62 experiment</i> . Published in: PoS(NuFact2021)130, DOI:10.22323/1.402.0130  |
|                   | N.Lurkin on behalf of the NA62 Collaboration, <i>Search for <math>K^+</math> decays to a lepton and invisible particles</i> . Published in: PoS NuFact2021 (2022) 157 DOI:10.22323/1.402.0157  |
|                   | R.Fiorenza on behalf of the NA62 Collaboration, <i>Measurement of the very rare <math>K^+ \rightarrow \pi^+ \nu\bar{\nu}</math> decay at the NA62 experiment at CERN</i> . Published in: PoS(NuFact2021)176, DOI:10.22323/1.402.0176     |
|                   | C.J.Parkinson, <i>Search for heavy neutral lepton production at the NA62 experiment</i> . Published in: PoS(EPS-HEP2021)686, DOI:10.22323/1.398.0686   |

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|--------|---|
|        | <p>S.Kholodenko on behalf of the NA62 Collaboration, <i>Search for lepton number and flavour violation in <math>K^+</math> and <math>\pi^0</math> decays</i>. Published in: PoS(DISCRETE2020-2021)066, DOI:10.22323/1.405.0066</p> <p>R.Volpe on behalf of the NA62 Collaboration, <i>Search for lepton number and flavour violation in <math>K^+</math> and <math>\pi^0</math> decays</i>. Published in: PoS(PANIC2021)426, DOI:10.22323/1.380.0426</p> <p>M.Koval on behalf of the NA62 Collaboration, <i>New measurement of the radiative decay <math>Ke3\gamma</math> at the NA62 experiment at CERN</i>. Published in: PoS(PANIC2021)427, DOI:10.22323/1.380.0427</p> <p>F.Brizioli on behalf of the NA62 Collaboration, <i>Preliminary results of the <math>K^+ \rightarrow \pi^0 e^+ \nu \gamma</math> decay study at the NA62 experiment</i>. Published in: PoS(EPS-HEP2021)553, DOI:10.22323/1.398.0553</p> <p>E.Minucci on behalf of the NA62 Collaboration, <i>Searches for lepton flavour and number violation in <math>K^+</math> and <math>\pi^0</math> decays at the NA62 experiment</i>. Published in: PoS(EPS-HEP2021)525, DOI:10.22323/1.398.0525</p> <p>E.Minucci on behalf of the NA62 Collaboration, <i>First results for searches of exotic decays with NA62 in beam-dump mode</i>, Published in: PoS(ICHEP2022)160, DOI: <a href="https://doi.org/10.22323/1.414.0160">https://doi.org/10.22323/1.414.0160</a></p> <p>V. Duk, G. Anzivino, A. Bizzeti, F. Brizioli, F. Bucci, P. Cenci, R. Ciaranfi, J. Engelfried, N. Estrada-Tristan and M. Lenti, <i>et al.</i>, <i>Particle identification with the NA62 RICH detector</i>, Published in: Nucl. Instrum. Meth. A 1057 (2023), 168689, DOI:<a href="https://doi.org/10.1016/j.nima.2023.168689">https://doi.org/10.1016/j.nima.2023.168689</a></p> <p>I.Rosa on behalf of the NA62 Collaboration, <i>Latest results from the NA62 experiment at CERN: Precision measurements and searches in beam-dump mode</i>, Published in: Nuovo Cimento della Societa Italiana di Fisica C, 47(3), 91, DOI:<a href="https://doi.org/10.1393/ncc/i2024-24091-2">https://doi.org/10.1393/ncc/i2024-24091-2</a></p> <p>R.Fiorenza on behalf of the NA62 Collaboration, <i>High Intensity Kaon Experiments (HIKE) at CERN SPS</i> Published in: Nuovo Cimento della Societa Italiana di Fisica C, 47(3), 86, DOI:<a href="https://doi.org/10.1393/ncc/i2024-24086-y">https://doi.org/10.1393/ncc/i2024-24086-y</a></p> <p>I.Rosa on behalf of the NA62 Collaboration, <i>Physics Beyond the Standard Model with the NA62 experiment at CERN</i>, Published in: PoS TAUP2023 (2024), 040, DOI:<a href="https://doi.org/10.22323/1.441.0040">https://doi.org/10.22323/1.441.0040</a></p> <p>I.Panichi on behalf of the NA62 Collaboration, <i>Searches for LF/LN violation and hidden sectors in kaon decays at the NA62 experiment</i>, PoS EPS-HEP2023 (2024), 335, <a href="https://doi.org/10.22323/1.449.0335">https://doi.org/10.22323/1.449.0335</a></p> <p>S. Martellotti on behalf of the NA62 Collaboration, <i>Status of searches for rare kaon decays at NA62 &amp; HIKE</i>, Published in: PoS WIFAI2023 (2024), 027, <a href="https://doi.org/10.22323/1.457.0027">https://doi.org/10.22323/1.457.0027</a></p> |
| Papers | <p>NA62 Collaboration, <i>A study of the <math>K^+ \rightarrow \pi^0 e^+ \nu \gamma</math> decay</i>, Published in JHEP 09 (2023), 040, DOI:<a href="https://doi.org/10.1007/JHEP09(2023)040">https://doi.org/10.1007/JHEP09(2023)040</a></p> <p>NA62 Collaboration, <i>Improved calorimetric particle identification in NA62 using machine learning techniques</i>, Published in: JHEP 11 (2023), 138 DOI:<a href="https://doi.org/10.1007/JHEP11(2023)138">https://doi.org/10.1007/JHEP11(2023)138</a></p> <p>HIKE Collaboration, <i>HIKE, High Intensity Kaon Experiments at the CERN SPS : Letter of Intent</i>, e-Print: arXiv:2211.16586 [hep-ex]</p>   |

NA62 Collaboration, *Search for dark photon decays to  $\mu^+ \mu^-$  at NA62*, Published in: JHEP 09 (2023), 035 DOI: [https://doi.org/10.1007/JHEP09\(2023\)035](https://doi.org/10.1007/JHEP09(2023)035)

NA62 Collaboration, *Search for  $K^+$  decays into the  $\pi^+ e^+ e^- e^+ e^-$  final state*, Published in: JHEP Phys. Lett. B 846 (2023), 138193, DOI: <https://doi.org/10.1016/j.physletb.2023.138193>

NA62 Collaboration, *Measurement of the  $K^+ \rightarrow \pi^+ \gamma\gamma$  decay*, Phys. Lett. B 850 (2024), 138513 <https://doi.org/10.1016/j.physletb.2024.138513>

HIKE Collaboration, *High Intensity Kaon Experiments (HIKE) at the CERN SPS Proposal for Phases 1 and 2*, e-Print: arXiv:2311.08231 [hep-ex]

NA62 Collaboration, *Search for Leptonic Decays of Dark Photons at NA62*, Published in: Phys. Rev. Lett. 133 (2024) no.11, 111802, DOI: <https://doi.org/10.1103/PhysRevLett.133.111802>

NA62 Collaboration, *Development of a new CEDAR for kaon identification at the NA62 experiment at CERN*, Published in: JINST 19 (2024) no.05, P05005, DOI: <https://doi.org/10.1088/1748-0221/19/05/P05005>

NA62 Collaboration, *First search for  $K^+ \rightarrow \pi^0 \pi^+ \mu^- e^+$  decays* e-Print: arXiv:2409.12981 [hep-ex]

(FIRENZE (IT)), September 30, 2024

Place and date



Name Surname