Prof. Dr. Elisabetta Prencipe

elisabetta-prencipe-10070b54

EDUCATION

2005 – 2008

PhD in Nuclear and Subnuclear Physics

Faculty of SMFN (Mathematics, Physics and Natural Science), University of Ferrara (IT), Summa cum Laude

- data analysis of the $B \to J/\psi\phi K$ rare decays at BaBar (charmonium spectroscopy). Published paper: PRD91 (2015) 012003
- development of C++ methods and classes for data analysis (MC simulations and data of the BaBar experiment – e^+e^- detector located at Stanford, USA)
- Root-based algorithms, multivariate analysis tools, $i.e.$ TMVA, development of tracking-software algorithms (C, C++, Fortran77)
- MC simulations for the $\overline{\text{P}}$ANDA experiment – $p\bar{p}$ future detector at FAIR, Germany; interface of the BaBar tracking algorithms inside the $\overline{\text{P}}$ANDA framework
- author of $TrkFixup$ – module TrkSvtHitRecovery, a tracking algorithm developed inside the BaBar framework (C++) with the purpose to fix bugs, improve reconstruction efficiency of tracks, write track finding and fitting procedures making use of the Kalman Filter method. Published paper: NIM A 729 (2013) 615
- track finding efficiency studies: K^0_S tracking efficiency studies. Published paper: NIM A 704 (2013) 44.

2003 – 2004

Master's degree in Physics

Faculty of SMFN, University of Roma La Sapienza (IT)

- data analysis of the $B^+ \to D^0K^+$ decays and study of the interference between $B^+ \to D^0K^+$ and $B^+ \to \bar{D}^0K^+$ to extract the γ/ϕ_3 angle of the Unitarity Triangle (CP violation in B decays) with BaBar data. Dalitz analysis. Characterization of background and study of an $ad\ hoc$ signal-to-background discriminant: comparison between Fisher/neural network discriminants, selection optimization, evaluation of branching ratio over MC and data samples. Published (update) paper: PRD78 (2008) 034023

1993

Socio-psycho-pedagogical high school

School: C. Poerio, Education and training (IT)

- For five years, I attended courses in Mathematics, Physics, Literature, Art, History, Geography, Chemistry, Physical training, Philosophy, Music, English, Latin, Psychology, and Pedagogy, with two years of training in an elementary school and 1-year of training (320 hours) in a nursery. The study was focused on learning teaching methods and developing pedagogical skills in teaching undergraduate students. I obtained the proper certification.

CAREER OUTSIDE ACADEMIA

2023

Italian, English, French and German content writer and proofrader at Topcontent | Translation quality control specialist

Articles written and approved for several newspapers, in the fields of economy, gambling, finance, business, and renewable energy.

Professional tutor at ABACUS

Private lectures and support to students in the age 13-18. I have taught Algebra, Geometry, Physics, English, Astronomic geography, in German and English languages.

Professional tutor at UniProf

Online lectures and thesis proofreading for students in several Italian and Irish Universities. I have taught Geometry, Algebra, General physics I and II, Statistics in English and Italian.

PEER REVIEW / EDITOR EXPERIENCE

2016 – 2023

I have worked as peer reviewer for:

- the American Physics Society (APS): 11 Physics Review D and 14 Physics Review Letters articles. The impact score of these ranks up to 9;
- 1 article at the European Physics Journal (EPJ), with an impact score of 4;
- 1 at the Canadian Physics Society;
- 2 at the Chinese Physics Society, with impact score of 4;
- 1 at the Journal of High Energy Physics (JHEP), with impact score of 8.58.

I have been also referee of many proceedings of international conferences since 2016, and tutor of student theses.

TRANSLATOR ACTIVITY

2008 – 2017

- I have worked as a volunteer and advocate for the Compassion Centre Onlus S.p.a., which offers care to over 2 million children in poor areas of the world. It is a long-distance adoption centre. I was involved as an English-Italian translator in the project 'Raise a child out of poverty with a book'.
- Topcontent translator from/to: English, Italian, French, German.

MANAGEMENT POSITIONS

2009 – 2024

- Principal Investigator of my research group in the Belle and Belle II experiments (Japan) until 2022;
- Diversity Officer of the Belle II Collaboration;
- Publication Committee of the Belle II Collaboration;
- Publication Committee of the $\overline{\text{P}}$ANDA Collaboration (Germany);
- Physics Advisory Committee of the Belle II Collaboration;
- Dissertation Committee at DFICU university (chair of PhD committee);
- Management Board of the yHEP association (young High Energy Physicists Association);
- Convenor of the Charmonium data-analysis working group at Belle II;
- Software Coordinator (skim and releases) at BaBar (Stanford, USA)

RESIDENCE ABROAD

2004 – 2019

- Chicago, Illinois, USA (2002);
- Annecy-le-Vieux, France (2007-2010);
- Berkeley, California, USA (2008);
- Stanford, California, USA (2009 and short periods from 2004 until 2011);
- Germany (2011 to present);
- Japan and China, short periods in 2011 - 2019, integrated over 8 months;

SPECIALIZATION COURSES

2023

- Online CS229 and CS230 courses - Stanford: Machine Learning (free course from 2018): Broad Introduction To Machine Learning and Statistical Pattern Recognition; Deep learning.
- University of Cambridge: Leveraging Big Data with Business Intelligence, with certificate, Credential ID: 4946023. Regression models and Deep Neural Network models were discussed, and a program in Python language was delivered to solve the problem of insurance and taxi accidents in New York.

ACADEMIC CAREER

January 2024 to present

Global Humanistic University (GHU), AI, UK

University Professor, equivalent to a full professor position level A

- PhD Advisory
- Lecturer

June 2023 – June 2024

Frankfurt School of Management and Finance (FSFM), DE

Lecturer in Mathematics and Statistics (Freelancer, on site)

June 2023 – June 2026

DFICU, UK University

Online Lecturer and dissertation committee (Freelancer, online)

2021

Assistant Researcher

II. Physics Institute, Justus-Liebig-University of Giessen, DE

- Belle and Belle II experiment - member
- Diversity and Inclusion Officer at Belle II
- Physics Statistics Advisory Committee at Belle II
- Publication Committee at Belle II
- Chair of the committee for the election of IB (Institutional Board) chair at Belle II
- Chair of the Hadron and Nuclear Physics Panel in the Management Board of the yHEP (young High Energy Physicist Association) - national reprentative of academics with non-permanent contract
- Convenor of the Charmonium data analysis working group at Belle II
- Principal investigator of a proposed and approved DFG (Deutsche Forschungsgemeinschaft) project: Search for 4- and 6- quark exotic states with BaBar+Belle combined data sets (177,350 euros). 1 PhD student employed under this project funding
- Supervision of 5 bachelor-, 1 master-, 1 PhD student
- data analysis of the Belle and Belle II experiment in particle physics; development of software tracking algorithm (C++ classes, Phyton scripts) to improve the reconstruction of long-lived particles, $e.g.\ K_S^0$

January 2020 – December 2020

Career interruption due to maternity leave

2013 – 2019

Scientist

Institute of Nuclear Physics, Forschungszentrum Juelich (FZJ), Juelich (DE)

- Principal Investigator of BaBar/ Belle/ Belle II projects at FZJ (DFG project)
- $\overline{\text{P}}$ANDA experiment - member
- Phyics Statistics Advisory Committee in Belle II
- Diversity and Inclusion committe at Belle II
- Convenor of the Charmonium data analysis working group at Belle II
- Chair of the committee for the election of the spokesperson of Belle II
- Organizing Committee of the bi-annual Hadron Physics Summer School HPSS for 4 editions, and chair of the HPSS2018 (67 students, 20 lecturers)
- data analysis in particle physics with BaBar + Belle data sets: charm and charm-strange spectroscopy to search for new exotic states
- Peer review of International Physics Journals (APS, EPJ, JHEP) and referee of many proceedings of international conferences.
- Publication Committee in $\overline{\text{P}}$ANDA
- MC simulations with Giant3/4 for the $\overline{\text{P}}$ANDA experiment
- MC interface/implementation of Kalman-filter based algorithms (tracking algorithms) in $\overline{\text{P}}$ANDA: genfit2 (C++), arxiv: 1902.04405 [physics.data-an]
- supervision of 3 PhD students ($\overline{\text{P}}$ANDA experiment: MC simulations with C++ software implementation)
- teaching duties at University of Bochum: nuclear astrophysics, neutrino physics, detector in hadron physics, tracking algortihms.

October 2016 – May 2017

Career interruption due to maternity leave

2011 – 2012 **Postdoctoral position**

Johannes Gutenberg University of Mainz, DE

- BaBar, BES III experiment - member
- lecturer in particle physics (2 semesters)
- data analysis and MC simulations (C++) for the BES III experiment: study of form factors in processes via $\gamma\gamma$ interactions
- interface of MC tools in the BES III software: EKHARA
- supervisor of 3 bachelor students

2007 – 2010 **Postdoctoral position**

LAPP - Annecy le Vieux, France, and University of Savoy

- data analysis with BaBar data (C++): $B \to D^0 K$ and extration of the angle γ/ϕ_3 of the Unitarity Triangle with ADS method. Published paper: PRD82 (2010) 072006
- Software Coordinator (skim and release) of the BaBar experiment
- Responsible for the computing facility at Lyon: data skimming at BaBar
- K^0_S tracking systematics team leader (C++, C algorithms) in BaBar

TEACHING DUTIES

2011 – 2022

- Particle physics (JGU-Mainz, 2011-2012)
- Tracking algorithms for Detectors in Hadron Physics (RUB-Bochum, 2014)
- Statistics (physics summer schools and topical workshops since 2014)
- Detectors in Hadron Phyisics (RUB-Bochum, 2016)
- Computational Applications in Nuclear Astrophsics using JAVA (RUB-Bochum, 2017)
- Detectors in Hadron Phyisics (RUB-Bochum, 2018)
- Physics of Massive Neutrinos (RUB-Bochum, 2018)
- HPSS (Hadron Physics Summer School): form factors in e^+e^- colliders (2012)
- HPSS 2014-2016-2018: Data analysis methods in particle physics
- JENNIFER 2016 physics summer school: statistics methods in particle physics (2016)
- FAIRNESS 2015 summer school: XYZ exotic states
- ABACUS and UniProf: lecturer in Math-Phys-Stat-Latin, honorary-based
- Introduction to Mathematics, module I and II (FSFM, 2023-2024)
- Introduction to Statistics, module I and II (FSFM, 2023-2024)

TUTORING STUDENTS

2007 – 2023

Tutor of 19 students (3 PhD-, 8 master-, 8 bachelor students)

- Dmytro Meleshko (PhD JLU-Giessen, ongoing)
- Andreas Hertens (PhD FZJ-Juelich, 2015) - partly contributed
- Lu Cao (PhD FZJ-Juelich, 2014) - partly contributed
- Oleksandr Skorenok (master TSNU-Kyiv, 2022)
- Dmytro Meleshko (master TSNU-Kyiv, 2021)
- Ihor Melnyk (master TSNU-Kyiv, ongoing)
- Robert Bormuth (master JGU-Mainz, 2012)
- Mauro Munerato (master Uni-Ferrara, 2007)
- Elisa Fioravanti (master Uni-Ferrara, 2007)
- Alexander Hahn (bachelor JGU-Mainz, 2011)
- Benedikt Kloss (bachelor JGU-Mainz, 2011)
- Ananya (bachelor visiting FZJ-Juelich, 2013)
- Taiisia Tysak (bachelor TSNU-Kyiv, 2019)
- Dmytro Meleshko (bachelor TSNU-Kyiv, 2019)
- Nils Ludwig (bachelor JLU-Giessen, 2021)
- Caroline Grün (bachelor JLU-Giessen, 2022)
- Christian Winkelmeier (bachelor JLU-Giessen, 2023)
- Ihor Melnik (master TSNU,Kyiv, 2023)
- Arsenii Kushev (master TSNU,Kyiv, 2023)

FELLOWSHIPS and GRANTS

June 2018 – June 2022

JENNIFER2

Japan and Europe Network for Neutrino and Intensity Frontier Experimental Research (JENNIFER/JENNIFER2): renewed application has been approved and funded with H2020-EU.1.3.3. - Stimulating innovation by means of cross-fertilisation of knowledge - JENNIFER2 represents an extension of the previuos JENNIFER, a MCSA-RISE (Marie Sklodowska-Curie Research and Innovation Staff Exchange - RISE) project.

December 2017 – May 2022

DFG Research Grant

Search for four- and six- quark exotic states with charm- and strange- quarks (177,325 euros)

October 2006 – April 2007

INFN Scholarship at Univ. Ferrara (IT)

Tracking software project within the BaBar experiment

April 2005 – December 2006

INFN Scholarship at Berkeley - LBNL (USA)

Development of tracking-software tools (C++), Kalman-filter based, at BaBar

August 2002 – October 2002

Scholarship at CDF, Chicago

Data analysis at the CDF experiment

ORGANIZER OF NATIONAL AND INTERNATIONAL EVENTS

2009 – 2021

- Hadron Physics Summer School, since 2012 (bi-annual physics summer school)
- PWA/ATHOS workshops, since 2018 (bi-annual workshop)
- VISTAS workshop (Bad Honnef, 2019) - canceled due to SARS-Covid19
- MITP: Hadron spectroscopy: the next big steps (14-25 March 2022)
- DPG - spring national annual physics meetings (yHEP session)
- JENNIFER physics summer school (2016)
- Indo-German symposium DWIH (Indore, Kolkata, Mumbai, 2013)
- Invited physicist at LBNL, SLAC, BINP

CONFERENCES, WORKSHOPS, SEMINARS

2005 – 2021

- DFG invited topical talk: Hunting XYZ Beasts at Belle and Belle II, 23.03.2022, Heidelberg.
- 21 invited plenary talks at international conferences, since 2009: DFG 2022, ECT* 2021-2019, PWA/ATHOS 2019, FAIRNESS 2017, Annual Helmholtz Alliance meeting 2016, EMMI 2015, SCHLESCHING 2015, HQL 2014, ICNPF 2014, HIRSCHEGG 2014-2018-2024, IFAE 2009. Proceedings published afterward.
- 26 assigned talks on behalf of the experiments where I have worked: ICHEP 2014, HADRON 2021-2017-2015, PHIPSI 2019-2009, CHARM 2018, Excited QCD Workshop 2019, CHEP 2016, BORMIO 2015, PANIC 2014, ICNPF 2014, MENU 2013-2007, MESONET 2013, EINN 2011, HQL 2010, PANIC, QWG 2007-2008, SIF 2005. Proceedings published afterward.
- 12 invited seminars (Univ. Giessen, Univ. Bochum, FZJ (Juelich), Univ. Mainz, TUM Munich; LBNL (Berkeley); LAPP (Annecy-le-Vieux); India (Mumbai, Kolcata, Indore); Academy of Vienna; KEK.
- 8 invited lectures at physics summer schools (statistics).
- Scientific pilot of the Minister counsellor, head of science and technology section, delegation of the EU to Japan at the First Collision Ceremony at KEK (26.07.2018).

SKILLS

Languages

- Italian (native)
- English (proficiency, C2)
- French (good, B2)
- German (proficiency, C1)
- Ancient Latin (very good)

Computing

C++, C, Fortran 77, OpenOffice, LateX, Microsoft Excel, Word; excellent use of Root-based algorithms, Phyton scripts, organization of web pages for conferences; expert in tracking-software algorithms; use of TMVA (neural network, BDT algortihms in data analysis); statistical tools, $e.g.$ Feldman-Cousin algorithms, written in C, JAVA or R language. Used to Confluence pages, Jira ticket system, pandas, Jupyter notebook, GIMP for graphic solutions, google and lime for survey preparation. Knowledge of BigQuery, Colab, NN, ML and google analytics. Preference: I work with Fedora o.s. (Linux) and I am deep C++ "oriented"

PUBLICATIONS

732 publications, 41430 citations, 22 personal works.

h_{HEP} = 102.

The list of the 10 most notable publications connected to the candidate research interest is provided below:

- Search for tetraquark states $X_{c\bar{c}s\bar{s}}$ in $D_s^+ D_s^+ (D_s^{*+} D_s^{*+})$ final states at Belle, Phys.Rev.D 105 (2022) 032002; 5 citations
- Evidence for $X(3872) \to J/\psi\pi^+\pi^-$ Produced in Single-Tag Two-Photon Interactions, Phys.Rev.Lett. 126 (2021) 122001; 15 citations
- Evidence for a vector charmoniumlike state in $e^+e^- \to D_s^+ D_{s2}^*(2573)^-$ + c.c., Phys.ReV.D 101 (2020) 091101; 12 citations
- Observation of a vector charmoniumlike state in $e^+e^- \to D_s^+ D_{s1}(2536)^-$ +c.c., Phys.Rev.D 100 (2019) 111103; 25 citations
- The Belle II Physics Book, PTEP 2019 (2019) 12; 844 citations
- Observation of a charged $(D\bar{D}^*)^\pm$ mass peak in $e^+e^- \to \pi D\bar{D}^*$ at s=$\sqrt{s}$= 4.26 GeV, Phys.Rev.Lett. 112 (2014) 022001; 353 citations
- Observation of a Charged Charmoniumlike Structure in $e^+e^- \to \pi^+\pi^- J/\psi$ at $\sqrt{s}$ = 4.26 GeV, Phys.Rev.Lett. 110 (2013) 252001; 977 citations
- Measurement of the $\gamma\gamma^* \to \pi^0$ transition form factor, Phys.Rev.D 80 (2009) 052002; 414 citations
- Evidence for $D^0 - \bar{D}^0$ Mixing, Phys.Rev.Lett. 98 (2007) 211802; 449 citations
- The BABAR Detector: Upgrades, Operation and Performance, NIMA 729 (2013) 615; 309 citations

ADDITIONAL INFORMATION

- URL: https://inspirehep.net/authors/1032847?ui-citation-summary=true
- GitHub link: https://github.com/prencipe/
- ORCID ID: 0000-0002-9465-2493
- DPG Membership since 2013
- Excellent skills in communication and happily working in international teams
- Demonstrated excellent problem-solving skills
- Demonstrated excellent skills in leading and motivating my team
- Teacher training, Curriculum developer for High education
- Love for: teaching, swimming, snow-board, painting, classic music
- Curious, open-mind, resilient, determinated and focused on my objectives
- Very sensitive to environmental sustainability issues. Public document written with yHEP management board: https://yhep.desy.de/sites/sites-custom/site-yhep/ content/e61887/e122133/yHEPStatementonenvironmentalsustainability inScience-final.pdf
- Deep passion for physics of fundamental interactions.
- Demonstrated ability in working under-pressure.
- Nominated to be the Institutional Board chair and Publication Committee chair of the Belle II experiment.
- Coaching Plus lectures attended (with certificate) at the Bildzentrum Bauer in Frankfurt am Main (DE).

- Mottos:
  "Genius is 1% talent and 99% hard work."
  "I will either find a way or make one."
  "Fall seven times and stand up eight."