

Curriculum vitae of Giuseppe Ruggiero

General Info

Name: Giuseppe Ruggiero
Nationality: Italian
e-mail:

Education

30/06/2003: PhD degree in Physics at University of Firenze,
Thesis: “*Measurement of the Charge Asymmetry in the K_{e3} Decay of K_L using the NA48 Detector*”, (supervisor prof. Enrico Iacopini)
2000-2003: PhD student in the Department of Physics at University of Firenze (Italy)
29/04/1999: Master’s degree in Physics (110/110 cum *laude*) at University of Firenze,
Thesis: “*Misura di R_b a LEP II con il rivelatore L3*”,
(supervisor prof. Bianca Monteleoni)
1994-1999: Student at the Department of Physics at University of Firenze (Italy)

Employment

01/11/2020 - present Associate Professor in Particle Physics, University of Firenze
30/05/2017 - 31/03/2021 Lecturer in Physics and Advanced Research Fellow, University of Lancaster
31/03/2016 - 29/05/2017 Advanced Research Fellow, University of Liverpool
01/02/2011 - 15/04/2016: Research Staff in Particle Physics at CERN (LD contract)
01/03/2007 - 31/01/2011: Research Staff in Particle Physics at Scuola Normale Superiore Pisa (Ric. TD)
01/02/2005 - 28/02/2007: Research fellowship at CERN
01/07/2003 - 31/01/2005: Postdoctoral fellowship at the University of Firenze

Fellowships and Awards

2015: Awarded a 5-years STFC Ernest Rutherford Fellowship (ERF) (UK)
2010: First ranked after selection procedure for a physics research staff position at CERN
2007: First ranked after oral - written test selection for a FIS04 position at Scuola Normale Superiore (Pisa)
2005: Awarded a research fellowship at CERN.
2001: Awarded PhD grants at Roma University “La Sapienza” and Firenze University.

Spoken Languages

Italian: Mother tongue

English: Level C2 oral and written

French: Level B2 oral; level B1 written

Informatics Competences

Operating systems: Linux, Windows

Programming and script languages: Python, C++, C, Bash, Perl, Fortran, LabView

Data analysis software: TMVA, ROOT, ROOFIT, Geant4; Excell

Software for versioning and archive: Git

Editing software: Latex, Word

Research Activity

Experiments

- 2025 - present: LHCb at CERN
- 2005 - present: NA62 at CERN
- 2001 - 2010: NA48, NA48/1 and NA48/2 at CERN
- 1998 - 2001: L3 at CERN

Principal Roles and Responsibilities

- 01/10/2022 - present: Spokesperson of the NA62 experiment.
- 01/01/2019 - 30/09/2022: deputy Spokesperson of the NA62 experiment.
- 2008 - 2018: Physics Coordinator of the NA62 experiment.
- 2010 - 30/09/2022: coordinator of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis of the NA62 experiment.
- 2017 - 31/03/2021: team leader of the NA62 Lancaster group.
- 2016 - present: member of Steering Committee of the NA62 experiment.
- 2015 - 30/09/2022: member of the Editorial Board of the NA62 experiment.

Other roles

- Member of the local committee of the conference BEACH 2026 (Firenze).
- Collaboration of research with INFN from 2022 to present.
- Associate to INFN from 2001 to 2010 and from 2020 to 2022.
- Member of the Physics Beyond Collider ECN3 WG task force.
- Referee for the international journals JHEP and Physics Letters B.
- Member of the advisory committee of the 2016, 2025 CKM workshop.

Summary of research interests and achievements

My research interests focus on experimental particle physics, and in particular on experiments at the European Center of Nuclear Research (CERN) to study flavour physics with Kaons.

My principal achievement is the design, construction, commissioning, exploitation of the NA62 experiment at CERN, with which I obtained the first observation and measurement of the ultra-rare decay of the K^+ meson to a positive pion and a neutrino anti-neutrino pair. I am Spokesperson of NA62 since 2022.

My fields of expertise are data analysis, statistics, phenomenology of flavour physics, detectors for particle physics, algorithms for particle reconstruction.

I have been speaker at more than 40 international conferences and seminars.

Bibliometric indicators (Scopus): articles 309, citations about 9600, h-index 50.

University and Teaching Activity

Academic positions

- From 01/11/2020 associate professor in particle physics at University of Firenze, sector FIS04, hired within the Italian-MUR scheme of direct call of researchers and professors abroad (Legge 230/2005, D.R. 466).
- 31/05/2017 - 31/10/2020 lecturer in particle physics at University of Lancaster (UK), hired after selection process and as a holder of a 5-years STFC-founded research grant scheme, awarded in 2015.
- 2007 - 2010 University researcher (limited duration time) in particle physics at Scuola Normale Superiore, hired with public selection with written and oral exam.

Recognition

- Fellow of the UK Higher Education Academy (HEA).
- Postgraduate Certificate in Academic Practice (PGCAP).

Taught Courses and Modules

- A.A. 2021-2023: XXXVII PhD in Physics University of Perugia, Cycle of lectures “Flavour Physics”.
- A.A. 2021-present: responsible of the course “Metodi sperimentali della fisica subnucleare”, Physics Department, Laurea Magistrale in Physics, University of Firenze.
- A.A. 2021-present: responsible of the course of Fisica Generale, module “Principi di Meccanica (A-D)”, Engineering Department, first-year undergraduates in Engineering, University of Firenze.
- A.A. 2020-2021: laboratory part of the course “Laboratorio di Fisica per i beni culturali”, Physics Department, Laurea Magistrale in Physics, University of Firenze.
- A.A. 2020-2021: course of Fisica Generale, module “Principi di elettromagnetismo”, Engineering Department, first-year undergraduates in Engineering, University of Firenze.
- 2018-31/10/2020: responsible of the course “Experimental methods in particle physics”, fourth-year undergraduates, in Physics, Physics Department, University of Lancaster.
- 2017-2018: co-chair laboratory course: “nuclear physics”, third-year undergraduates in Physics, Physics Department, University of Lancaster.
- 2010: tutor for the course: “Elettromagnetismo II”, third-year undergraduate in Mathematics, Physics Department, University of Pisa.
- 2009-2010: demonstrator for the laboratory course: “Laboratorio di fisica nucleare”, fourth-year undergraduates in Physics, Physics Department, University of Pisa.
- 2009: tutor for the course: “Fisica I”, first-year undergraduate in Physics, Physics Department, University of Pisa.
- 2008: demonstrator for the course: “Laboratorio di Fisica I”, first-year undergraduates of Classe di Scienze, Scuola Normale Superiore, Pisa.

PhD Supervision

- Formally supervised or co-supervised students:

- Informally supervised

Teaching achievements

- I took over the course “Metodi sperimentali della fisica subnucleare” in 2021 at the University of Firenze. The module covers accelerator physics, detection techniques, reconstruction algorithms, trigger and DAQ architectures, modern experiments at collider, fixed target and for neutrino physics. I have written a series of lecture notes to support the didactic.
- I chair the course of “Principi di Meccanica” to first-year undergraduate course of the Engineering Department of University of Firenze. The content of the course is classical mechanics, from the kinematic of the point to the dynamic of the rigid body. With 200 students per year, I accomplished the task to start instilling a new type of learning approach and the scientific method into young students just coming from secondary school. This requires a continuous effort of feedback on my side that goes beyond the subject treated during the course. I have written details lecture notes to support the didactic.
- I took over the 4th year module of Experimental Methods in Particle Physics in 2018 at Lancaster University. I have revolutionised the course by introducing subjects linked to the up-to-date research in experimental particle physics, with the goal to give students the instruments necessary to start doing research in this field. I considered this a primary objective for 4th year UK students, that are asked to progressively shift from a learning to a personal production phase. The module covered probability and statistics, techniques of particle acceleration and detection, reconstruction and data analysis.

Detailed description of the research activity

LHCb Experiment (2025 - present)

Full author of LHCb experiment since fall 2025. My activity focuses on the analysis of data collected in 2025 by LHCb in the SMOG2 configuration to study isospin effects in anti-proton production. I supervise master's thesis of LHCb at the University of Firenze.

NA62 Experiment (2005 - present)

NA62 is a CERN experiment designed to measure the branching ratio of the decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ using a decay-in-flight technique. The experiment took data from 2015 to 2018 and from 2021 to 2026. NA62 took also data in 2007 using the experimental apparatus of the experiment NA48 to study with permille precision lepton universality in kaon decays. I had a prominent role in all the phases, from its design to the delivery of the physics results. I worked on all the aspects of the experiment, data analysis, software and hardware. I am part of the management since 2018.

Responsibilities

01/10/2022 present:	Spokesperson and chair of the NA62 Steering Committee.
01/01/2019 30/09/2022:	Deputy Spokesperson.
2008 - 2018:	Physics Coordinator.
2010 - 30/09/2022:	coordinator of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis.
2017 - 31/03/2021:	team leader of the NA62 Lancaster group.
2016 - present:	member of the NA62 Steering Committee.
2015 - 30/09/2022:	member of the NA62 Editorial Board.
2005 - 2016:	responsible for the offline reconstruction of the Straw Spectrometer.
2005 - 2016:	responsible for the offline reconstruction of the electromagnetic calorimeter.
2012 - 2013:	coordinator of the analysis of the data collected during the 2012 NA62 technical run.
2007:	run coordinator; responsible for the charged hodoscope.
2006:	run coordinator during the test beam for the measurement of the LKr inefficiency.

Achievements

Management

- Preparation of the post-data taking period of the experiment in terms of physics program, financial profile and legal matters.
- Interaction with financial agencies and CERN Managements for updates and modifications of the Memorandum of Understanding.
- Preparation and presentation of the status reports of the experiment for the CERN SPS Committee yearly review.
- Yearly presentation of status of the collaboration at the CERN Financial Review Committee.
- Interactions with press offices from CERN, Italy, USA and UK to disseminate to the general public the first observation of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay announced by NA62 in 2024.
- Organization of the physics analysis activity of the NA62 experiment by creating and defining the structure of the analysis working groups.

Data Analysis

- Active participation to the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis using the data collected in 2023 and 2024. With this analysis NA62 has reduced significantly the background allowing the branching ratio of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ to be measured with less than 20% relative precision.
- Among the principal analyzers of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ branching ratio measurement using data collected in 2021-22. In particular, I found a background originated from a rare configuration of the $K^+ \rightarrow \mu^+ \nu \gamma$ decay that explained critical issues encountered during the analysis. This study allowed the completion of the analysis and the delivery of the result with the first observation of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay, which is also the rarest meson decay ever observed. The result is published on JHEP. CERN, INFN and STFC announced this result to the general public with dedicated press releases. The result has received attention worldwide with divulgative articles published on newspapers. I presented this result in 2025 at the Moriond EW conference.
- I developed a model describing the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ sensitivity as a function of the beam intensity. This model has driven the choice of the optimal intensity used for the 2024-25 and 26 data taking periods.
- Principal analyzer and coordinator of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ branching ratio measurement using the data collected in 2018. I worked to the optimization of the analysis making use of multivariate analysis techniques in order to reach an evidence of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay. The result provided the first $> 3\sigma$ experimental evidence of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay and the most precise to date measurement of the branching ratio of this decay mode with about 35% relative precision. I presented this result as part of a review of the state of the art of the kaon physics in the plenary session of the ICHEP2020 conference. I am corresponding author of the letter summarizing this result published on JHEP.
- Principal analyzer and coordinator of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ branching ratio measurement using the data collected in 2017. I made the first announcement of the final result at the international conference on Kaon physics “KAON2019” in September 2019. I worked to all the aspects of the analysis refining the strategy of the 2016 data analysis and developing a new method to estimate the dominant accidental background. The data analysis has improved of a factor of 2 the sensitivity of the previous experiments. I have written and I am corresponding author of a detailed paper describing the analysis technique and this result, which is published on JHEP.
- Principal analyzer and coordinator of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ search using the data collected in 2016. I worked to all the aspects of the analysis: I defined the full blind-analysis strategy; I developed and implemented a signal selection able to reach a single event sensitivity at the level of 10^{-10} ; I investigated and realized data-driven methods to study possible sources of background coming both from K^+ decay and from accidental beam activity; I performed the statistical analysis of the result. The final result demonstrates for the first time the feasibility of the decay-in-flight-technique for the study of the ultra-rare decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$. I am the corresponding author of the published paper. Many of the software tools developed by myself in previous years and refined for the 2016 analysis are widely used by the collaboration in all the analysis. I have summarized the work in two NA62 internal notes.
- Contributor to the analysis of the search of the dark-scalar particle X in the decay $K^+ \rightarrow \pi^+ X$, with X decaying into invisible. I coordinated the work of the analysis as part of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ working group which I chaired. On the technical side I provided the modelling of the background as a spin-off of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis. The result of the 2017 data is published on JHEP, that of 2018 is included in the latest $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ article of NA62.
- Principal author of the analysis of the data quality during the data taking periods in 2016, 2017 and 2018.

- Principal analyzer of the data taken by NA62 during the minimum bias run of 2015. I have developed: the first matching algorithm between the π^+ and K^+ reconstructed tracks; the first study of $\pi - \mu$ separation with RICH and calorimeters; the first study of π^0 rejection using the electromagnetic calorimeters.
- Principal analyzer of the data taken by NA62 during the pilot run of 2014. I have: developed the time calibration and geometrical alignment procedure of the straw tubes of the spectrometer; included the measured map of the magnetic dipole field of the spectrometer in the track fit; reconstructed for the first time the π^+ track in the Straw spectrometer; reconstructed the physical kinematic quantities with precision matching the expectations from simulation. I have also developed the calibration procedure of the NA62 electromagnetic calorimeter at liquid krypton using photons and electrons.
- Author of the Monte Carlo studies in 2013 to define the Level0 trigger strategy in view of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ data taking periods. I developed a simulation of the expected accidental activity in the detectors making use of an overlay techniques; I studied the data rates expected at Level0 and I investigated the effect on signal and rates of the different trigger conditions based on calorimetric energy and photon and muon veto conditions. I described this study in an NA62 internal note.
- Author of the sub-percent precision determination of the complete 3D field map of the dipole magnet of the NA62 Straw spectrometer carrying on an analysis of the 10^5 measurements of the magnetic field performed using a matrix of Hall probes in 2011
- Principal analyzer of the data taken by NA62 during the technical run of 2012. I developed a K^+ decay tagging method by selecting a pure $K^+ \rightarrow \pi^+ \pi^0$ sample using the electromagnetic calorimeter only. I measured for the first time the sub-nanoseconds timing coincidence between the sub-detectors mounted along the 200 m experimental length of NA62. I studied the response of the first prototype of the new detectors mounted in 2012 in view of their completion for the physics runs: hadron calorimeter, large angle electromagnetic calorimeters (LAV), straw tubes.
- In 2010-2012 I evaluated the expected sensitivity of NA62 in view of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ measurement. I set up the basic criteria for signal selection and background measurement making use of the detailed simulation of the detectors under construction. I studied the possible background sources and evaluated the expected rejection factors. The results of this analysis have been presented as the public benchmark performance of the NA62 experiment during the years prior to the start of data taking.
- Author of the measurement of the single photon detection efficiency of the LKr with 10^{-5} precision performed on data collected by NA48 in 2004 and in a 2006 dedicated test-beam at CERN. This measurement demonstrated the possibility of using the NA48 electromagnetic calorimeter in NA62 to reach the level of photon suppression required by the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ measurement.

Offline Software

- Main developer of the data reduction scheme for the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis.
- Author of the official $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ selection code.
- Author of the official straw spectrometer reconstruction code used by NA62: development of the full algorithm from pattern recognition to the final 3D track fit based on a Kalman Filter technique.
- Author of the reconstruction of the electromagnetic calorimeter at LKr used until 2018: adaptation of the existing FORTRAN code from NA48 to the new NA62 requirements in terms of photon identification efficiency.
- Development of the simulation of the experimental set-up of the 2012 technical run within the NA62 software framework, finding a remarkable agreement with data.

- Main author of a fast simulation of the experimental apparatus used during the project phase of NA62. Author of the official GEANT4 simulation of the straw spectrometer. Author of the simulation of the NA62 beam line within the framework of the full NA62 simulation using an optical model developed at CERN for the project of the beam line itself. Implementation of the FORTRAN-based kaon decay generator of NA48 within the C++ NA62 framework.

Design of the NA62 Experimental Apparatus

- Determination of the experimental requirements for kinematic reconstruction. I have been project creator of a spectrometer for π^+ tracking made by straw tubes in vacuum: definition of the detector material budget, resolution and configuration. I defined the specifications for the Si-pixel detector for beam particle tracking in terms of time resolution, spatial resolution and material budget. Both these studies have been the benchmark for designing and building the straw spectrometer and the Gigatracker detectors, presently used by the NA62 experiment.
- Determination of the experimental requirements for $\pi - \mu$ separation. This study has been the benchmark for designing and building the RICH and the Muon Veto systems, presently used by the NA62 experiment.
- Determination of the experimental requirements for suppression of kaon decays with multiple charged particles in the final state. These studies has lead NA62 to add off-acceptance detectors (called MUV0 and HASC) to the experimental layout.
- Definition of the timing requirements for the detectors located on the beam line (CEDAR and CHANTI) in order to suppress the background coming from beam-induced activity.

Run activity, Online software, Hardware

- 2018 data taking: on-call expert for the liquid krypton calorimeter and for the Level0 calorimeter trigger.
- 2017 data taking: on-call expert for the liquid krypton calorimeter and for the online monitoring.
- 2016 data taking: on-call expert for the liquid krypton calorimeter.
- Definition of the physics goals and strategy of all the data taking periods from 2014 to 2018.
- Participation as a shifter to all the data taking periods from 2014 to 2026.
- Preparation of the MUV0 detector before the start of the data taking in 2016.
- Author of the software for straw spectrometer data decoding during the 2014 and 2015 runs. Development of an online software to integrate the spectrometer data taken in 2014 with the data from the other sub-detectors.
- Definition of the goals and strategy of the 2012 technical run.
- Development of a DAQ software to readout the LKr detector independently from the common data taking during the 2012 NA62 technical run to overcome readout issues emerging during this run and preventing the completion of the run program itself.
- Laboratory test at Pisa University from 2008 to 2010 to develop a DAQ and trigger system based on TDC's mounted on specific readout boards (TELL62).
- Active role during the 2009 test beam of the RICH prototype: author of the software for DAQ, data decoding and on-line monitor.
- Setting-up of the 2007 data taking strategy during the period of run coordination to define the optimal running conditions in view of the measurement of R_K .

Significant outputs

- Invited speaker at Moriond EW 2025 conference reporting the first observation of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay.
- Among the main analyzers of the study reporting the first observation of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay using data collect in 2021-22 published in JHEP(2025)02.
- Prinipal author and editor of the NA62 Status Report to the SPSC from 2023 to 2026.
- Co-author and one of the principal editor of the Letter of Intent for the HIKE project CERN-SPSC-2022-031, SPSC-I-257.
- Correspoding author of the published paper reporting the final result of the analysis of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay using the data collected by NA62 in 2016-17-18 (JHEP(2021)06).
- Invited speaker at the plenary session of the international conference ICHEP2020 to review the physics of rare kaon decays.
- Corresponding author of the published paper reporting a detailed description of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ and the result using the data collected by NA62 in 2017 (JHEP(2020)11).
- Corresponding author of the published paper reporting the first analysis of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay using the data collected by NA62 in 2016 (PLB (2019) 791).
- Author of two NA62 internal notes describing the details of the selection and analysis of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay using the data collected by NA62 in 2016 (NA62-18-04, NA62-18-05).
- Speaker at the international conference KAON2019 to make the first announcement of the result on the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay using the data collected by NA62 in 2017.
- Speaker at a CERN EP seminar in March 2018 to present the results of the study of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay using the data collected by NA62 in 2016.
- Author of the section describing $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis using the 2017 data in the 2019 NA62 Status Report to the SPSC (SPSC-SR-249).
- Internal referee and co-author of the published paper reporting the result of the search of heavy neutral leptons in $K^+ \mu^+ \nu$ and $K^+ e^+ \nu$ decays using data collected by NA62 in 2015 (PLB (2018) 778).
- Speaker at the SPSC open session of 2017 and 2018 to present the yearly status report of the NA62 experiment.
- Author of the section describing $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis using the 2016 data in the 2018 NA62 Status Report to the SPSC and editor of the full document (SPSC-SR-229).
- Author of the section describing $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis using the 2016 data in the 2017 NA62 Status Report to the SPSC and editor of the full document (SPSC-SR-208).
- Co-author of the NA62 published papers using the data collected from 2015 onwards. I contributed to all of the publications as author of the track reconstruction and of several analysis routines developed for the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ analysis. I also closely followed the analysis in my capacity of Physics Coordinator.
- Speaker at a CERN EP seminar in March 2015 to present for the first time the analysis of the data collected by NA62 during the 2014 pilot run.
- Author of a published paper and an NA62 internal note reporting the measurement of the magnetic field of the spectrometer dipole magnet (JPG 43 (2016) 12, NA62-14-09).

- Author of a NA62 internal note reporting the L0 trigger strategy to take $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ during the NA62 physics runs (NA62-14-01).
- Among the principal authors of the NA62 Technical Design Document (<https://cdsweb.cern.ch/record/1404985>).
- Authors of various sections of the NA62 status reports documents submitted to the SPSC in 2015, 2013, 2011 and 2007 (SPSC-SR-157, SPSC-SR-115, SPSC-SR-083, SPSC-M-760).
- Author of a NA62 internal note describing a first version of the offline reconstruction of the straw spectrometer (NA62-12-01).
- Co-author of the published paper reporting the results of the 2009 RICH test beam (NIM A (2010) 621).
- Author of a NA62 internal note reporting the LKr inefficiency measurement (P326-06-02).
- Among the principal authors of the Proposal for an experiment to measure the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ branching ratio (SPSC-P-326).
- Author of a NA62 internal note summarizing the sensitivity studies performed in the design phase of the experiment (P326-05-01).
- Since 2004 speaker at international conferences and workshops to present the status of the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ experiment at CERN and author of the corresponding proceedings.
- Co-author of the NA62 published papers using the data collected in 2007 about the measurement of R_K (PLB (2013) 719 and PLB (2011) 698).
- Invited speaker at conferences in 2008 (Moriond EW), 2012 (CKM Workshop) and 2013 (KAON 2013) to present the R_K measurement and author of the corresponding proceedings.

NA48 Experiment (2001-2010)

I have been member of the NA48 collaboration at CERN since 2001. joining also the program of NA48/1 and NA48/2 till to their completion. I studied CP-violation in the K^0 and $K^\pm$ mesons and participated in all data taking periods concerning: ϵ'/ϵ measurement (2001), K_S high intense program (2002), and $K^\pm$ physics program (2003-2004).

Responsibilities

- 2001-2004: Responsible for the operation and time calibration of the charged hodoscope
- 2003-2004: Responsible for the operation and for the efficiency monitoring of the charged pre-trigge.
- 2002: Responsible for the high-level trigger for $K_S \rightarrow e^\pm \pi^\mp \nu_e$ and $K_S \rightarrow \mu^\pm \pi^\mp \nu_\mu$ decays.

Achievements

- Principal analyzer of CP-violating charge asymmetry in $K_L \rightarrow \pi^\pm e^\mp \nu$ decays with a world-leading uncertainty of 7×10^{-5} (subject of my PhD thesis). Major achievements of this measurement were:
 - Study of the charge-dependence of the response of the electromagnetic (LKr) and hadronic calorimeter and of the geometrical acceptance of the apparatus down to a level of 10^{-5} ;

- Determination of the electron identification capability of the LKr calorimeter;
- Evaluation of the pion punch-through probability in the hadronic calorimeters.
- Co-analyzer of the measurement of the CP-violating Dalitz asymmetry in $K^\pm \rightarrow \pi^\pm \pi^+ \pi^-$ and $K^\pm \rightarrow \pi^\pm \pi^0 \pi^0$ decays. I studied systematic effects of charge asymmetry induced by drift-chamber misalignment problems and the time and charge dependent variations of the beam geometry.
- Author of an on-line analysis to monitor the quality of the data taken in 2001 to measure the CP-violation observable ϵ'/ϵ in K_L decays into two pions. In particular I investigated the K_S tagging algorithm and the $K_L - K_S$ mis-tagging probability.

Significant outputs

- Author of an NA48 internal note about the measurement of the CP-violating K_{e3} charge asymmetry (NA48-04-06).
- Speaker at invited talks on rare K_S and K_L decays at the international conferences.
- Co-author of the NA48 publications. In particular I contributed to
 - Measurement of the CP-violating Dalitz asymmetry in $K^\pm \rightarrow \pi^\pm \pi^+ \pi^-$ and $K^\pm \rightarrow \pi^\pm \pi^0 \pi^0$ (PLB (2006) 634, PLB (2006) 638 and EPJC (2007) 52);
 - Comparison of the $K_S \rightarrow e^\pm \pi^\mp \nu_e$ and $K_S \rightarrow \mu^\pm \pi^\mp \nu_\mu$ branching ratio (PLB (2007) 653).

L3 Experiment (1998-2000)

From 1998 to 2000 I worked on the L3 LEP experiment at CERN where I participated in the data taking periods of the phase 2 of LEP during the years 1999 and 2000.

Achievements

- Main analyzer of the measurement of the R_b parameters at e^+e^- center-of-mass energies above the Z -pole, defined as the fraction of pairs of b quarks produced in $e^+e^- \rightarrow q\bar{q}$.
- Main author of the analysis of the search for a possible production of a light supersymmetric partner of the bottom quark (s-bottom) in e^+e^- interactions at a center-of-mass energies of 189-208 GeV.

Significant outputs

- Principal author of the paper reporting the measurement of R_b (PLB (2000) 489).
- Principal author of an L3 internal note summarizing the light s-bottom search analysis (L3 note 2538).
- Invited talk reporting the results of the four LEP experiments about R_b at energies above the Z -pole at the international conference BEACH 2000 (Valencia 2007, proc. in Nucl. Phys. B (2001) 93 (Proc. Suppl.)).

List of Conferences

International Conferences and Seminars

- 27 May 2025, CERN, speaker at the SPSC open session: “2024 NA62 Status Report”.
- 20 May 2025, University of Tor Vergata, Roma, speaker at Particle Physics Seminar: *Rare Kaon Decays: a unique probe for New Physics*
- “59st Rencontres de Moriond EW 2025”, La Thuile, Aosta, 23-30 March 2025, speaker of an invited talk in plenary session: “*On the ultra-rare $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ decay at NA62*”.
- 7 May 2024, CERN, speaker at the SPSC open session: “2024 NA62 Status Report”.
- “FPCP 2023”, Lyon, 29 May - 2 June 2023, speaker of an invited talk in plenary session: “*Physics with Kaons at NA62*”.
- 10 May 2023, CERN, speaker at the SPSC open session: “2023 NA62 Status Report”.
- 17 May 2021, University of Chicago (online), invited speaker at a Particle Physics Seminar: “*Kaon Physics at CERN with the NA62 Experiment*”.
- “ICHEP2020”, Prague, online, 28 July - 6 August 2020, invited speaker of a review talk in plenary session: “*Rare Decays of K Mesons*”
- “KAON 2019”, Perugia, Italy, 10-13 September 2019, invited speaker of a talk in plenary session: “*Latest measurement of $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ with the NA62 experiment at CERN*”.
- “2018 Vulcano Workshop”, Vulcano Island, Sicily, 20-26 May 2018, invited speaker of a talk in plenary session: “*NA62 first result on $K^+ \rightarrow \pi^+ \nu \bar{\nu}$* ”.
- April 2018, speaker at the SPSC open session: “2018 NA62 Status Report”.
- 27 March 2018, speaker at a CERN EP seminar: “ *$K^+ \rightarrow \pi^+ \nu \bar{\nu}$: First results from the NA62 experiment at CERN*”.
- “EPS 2017”, Venice, Italy, 5-12 July 2017, speaker of an invited review talk in parallel session: “*Recent Results from Kaon Physics*”.
- 4 April 2017, speaker at the SPSC open session: “2017 NA62 Status Report”.
- “Kaon 2016”, Birmingham, UK, 14-17 September 2016, invited speaker of a talk in plenary session: “Status of the CERN NA62 Experiment”.
- “51st Rencontres de Moriond EW 2016”, La Thuile, Aosta, 12-19 March 2016, speaker of an invited talk in plenary session: “ *π^0 form factor and $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ at NA62*”.
- 10 March 2015, CERN, speaker at a CERN EP seminar: “*The NA62 Experiment at CERN: status and perspectives*”.
- 10 February 2015, Liverpool, invited speaker at a Particle Physics Seminar: “*Rare Kaon Physics*”.
- “PANIC 2014”, Hamburg, Germany, 25 August– 29 August 2014, speaker of a talk in parallel session “*Prospects for $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ observations at CERN with NA62*”.
- 19 March 2014, Louvain la Neuve, invited speaker at a Particle Physics Seminar: “*Kaon Physics in the LHC Era: the Experimental Quest for $K^+ \rightarrow \pi^+ \nu \bar{\nu}$* ”.

- “Kaon 2013”, Ann Arbor, Michigan, 27 April–1 May 2013, speaker of two invited talks in plenary session: “*R_K Measurement with NA62 at CERN SPS*”
“*The NA62 Experiment: Prospects for the $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ Measurement*”.
- “The 7th International Workshop on the CKM Unitarity Triangle”, Cininnati, Ohio, 28 Septmber–2 October 2012, speaker of a talk in parallel session “*NA62: R_K and $K^+ \rightarrow \pi^+ \nu \bar{\nu}$* ”.
- “FPCP 2011”, Maale Hachamisha, Israel, 23–27 May 2011, speaker of an invited talk in plenary session: “*NP Limits from Kaon Decays*”.
- “HQL 2010”, Frascati 11–15 October 2010, speaker of a talk in plenary session: “*The NA62 Experiment at CERN*”.
- “Beach 2010”, Perugia 21–26 June 2010, speaker of an invited talk in plenary session: “*The NA62 Experiment at CERN*”.
- “Kaon 2009”, Tsukuba 9–12 June 2009, speaker of an invited talk in plenary session: “*The NA62 experiment at CERN for $K^+ \rightarrow \pi^+ \nu \bar{\nu}$* ”.
- “New Trends in High Energy Physics”, Yalta, Crimea, 27 September – 4 October 2008, speaker of an invited talk in plenary session: “*ChiPT tests and radiative kaon decays*”.
- “XLIIIInd Rencontres de Moriond EW 2008”, La Thuile, Aosta, 1-8 March 2008, speaker of an invited talk in plenary session: “*NA48 Results*”.
- “Kaon 2007”, Frascati 21–25 May 2007, speaker of an invited talk in plenary session: “*The $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ experiment at CERN*”.
- “Heavy Quarks & Leptons 2006”, Munich 16–20 October 2006, speaker of a talk in plenary session: “*The NA48/3 experiment at CERN*”.
- “Flavour in the era of LHC” workshop, CERN 7–10 November 2005, speaker of a talk in session “Working Group 2”: “*Future Kaon Program at CERN*”.
- “K-RARE DECAYS” workshop, Frascati 26–27 May 2005, speaker of a talk in plenary session: “*Background rejection in NA48/3*”.
- DAΦNE 2004, “Physics at Meson Factories”, Frascati 6–11 June 2004, speaker of a talk in plenary session: “*NA48 Results on K Rare Decays*”.
- BNL Annual Users Meeting, Brookhaven 10-15 May 2004, invited speaker of a talk in session “Workshop on Future Kaon Physics”: “*NA48 Future Plans*”.
- Pheno 2003 Symposium, Madison, 5–7 May 2003, speaker of a talk in parallel session: “*NA48 Results on Rare KS, KL Decays*”.
- “Beach 2000”, Valencia, 27–30 June 2000, speaker of a talk in plenary session: “*R_b measurements at center-of-mass-energy above the Z pole at LEP*”.

UK Conferences - Workshops

- “Higgs Maxwell Workshop 2020”, Edinburgh 5 February 2020, talk: “Rare Kaon decays and NA62”.
- “UK HEP Forum 2019 - What do the next 10 years have in store ?”, Abingdon, 24-25 September 2019, talk: “Prospects of Kaon physics”.

Italian Conferences

- LXXXIX National Congress of Italian Physics Society, Parma, 17 September–22 September 2003, talk: “*Misura dell’asimmetria di carica nei decadimenti K_{e3} del K_L con l’esperimento NA48*”.
- XV Congress on High Energy Physics - IFAE, Lecce 23–26 April 2003, talk: “*Decadimenti rari e non del K_L* ”.
- LXXXVI National Congress of Italian Physics Society, Palermo, 6–11 October 2000, talk: “*Misura di A_{FB}^b ad una energia del centro di massa di 189 GeV con il rivelatore L3 a LEP*”.
- XII Congress on LEP Physics, Trieste, 26–28 April 2000, talk: “*Produzione di coppie $f\bar{f}$ a LEP 2*”.
- LXXXV National Congress of Italian Physics Society, Pavia, 20–24 September 1999, talk: “*Misura di R_b a LEP fase 2 col rivelatore L3*”.

Firenze 10/5/2026

Giuseppe Ruggiero

Francesca Bucci

Primo Ricercatore, INFN Sezione di Firenze

Indirizzo:

ORCID: [ORCID](#) Web of Science: [Web of Science](#) Scopus: [Scopus](#)

Posizioni attuali

- Primo Ricercatore, INFN Sezione di Firenze.
- Professore a contratto, Università degli Studi di Firenze, Dipartimento di Fisica e Astronomia.

Formazione

2001–2004	Dottorato di Ricerca in Fisica, Università degli Studi di Pisa.
2000	Laurea in Fisica, Università “La Sapienza” di Roma. Voto: 110/110 e lode.

Posizioni accademiche e di ricerca

2023–oggi	Primo Ricercatore, INFN Sezione di Firenze.
2017–oggi	Professore a contratto, Università degli Studi di Firenze, Dipartimento di Fisica e Astronomia.
2015–2016	Paid Scientific Associate, CERN.
2015–2022	Ricercatore, INFN Sezione di Firenze.
2012–2015	Ricercatore a tempo determinato, INFN Sezione di Firenze.
2010–2011	Ricercatore Post-Doc, Università degli Studi di Perugia.
2005–2010	Ricercatore Post-Doc, Università degli Studi di Firenze.

Responsabilità scientifiche e di coordinamento

2025–oggi	Responsabile locale del gruppo ALADDIN INFN Firenze.
2025–oggi	Responsabile del gruppo di lavoro DRD4 di Firenze.
2024–2025	Responsabile locale del gruppo TWO-CRYST INFN Firenze.
2022–oggi	Project Leader del RICH di NA62.
2021–2022	Coordinatrice delle analisi italiane di NA62.
2019–2021	Deputy Project Leader del RICH di NA62.
2019–oggi	Responsabile locale del gruppo NA62 INFN Firenze.
Ottobre 2015	Run Coordinator di NA62.
Novembre 2016	Run Coordinator di NA62.
Giugno 2018	Run Coordinator di NA62.

Finanziamenti ottenuti in bandi competitivi che prevedano la revisione tra pari

- **Progetto di ricerca di Rilevante Interesse Nazionale (PRIN) 2010Z5PKWZ (bando 2010-2011)** Titolo: “Sviluppo di rivelatori di altissima efficienza ed eccellente risoluzione temporale, e delle tecniche sperimentali connesse, per lo studio della fisica del sapore e la ricerca di ‘nuova fisica’ nei decadimenti ultrarari dei mesoni K neutri mediante il potenziamento dell’apparato NA62 al CERN.” Durata 36 mesi. 771kE. Partecipante e co-autrice del progetto.
- **Progetto di ricerca di Rilevante Interesse Nazionale (PRIN) 2008TMHBWJ (bando 2008)** Titolo: “Simulazione completa del RICH di NA62, capace di distinguere pioni da muoni con una inefficienza inferiore a 1 di sospensione e allineamento dei suoi specchi. Progetto e costruzione di un trigger di molteplicità di livello 0”. Durata 24 mesi. 184kE. Partecipante e co-autrice del progetto.

Attività di servizio accademiche e di ricerca

2025	Membro della Commissione del Premio di Laurea «Annamaria Cartacci».
2025	Membro della Commissione per il conferimento di un Contratto di Ricerca presso la SNS di Pisa, Classe di Scienze.
2024	Membro della Commissione del Premio di Dottorato «Marcello Conversi».
2023–oggi	Membro del Collegio di Dottorato del Dipartimento di Fisica e Astronomia dell’Università degli Studi di Firenze.
2018–oggi	Membro INFN del gruppo del riesame e del comitato di indirizzo del Dipartimento di Fisica e Astronomia dell’Università degli Studi di Firenze.
2017–2019	Membro della Commissione Esaminatrice per gli Assegni di Ricerca della Sezione di Firenze dell’INFN.

Attività di valutazione ed editoriali

2020–oggi	Revisore dei progetti di ricerca finanziati dalla Swiss National Science Foundation.
2020–2025	Membro della Commissione di Referaggio di Belle II nell’ambito della CSN1 dell’INFN.
2019–oggi	Membro dell’Editorial Board di NA62.

Organizzazione di conferenze e scuole

- Membro del Comitato Organizzatore Locale del “112° Congresso Nazionale della SIF”, 2026.
- Membro del Comitato Organizzatore Locale della “XVI International Conference on Beauty, Charm, Hyperons in Hadronic Interactions (BEACH)”, 2026.
- Member del Comitato Organizzatore Locale degli “Incontri di Fisica delle Alte Energie 2024”, 2024.
- Membro del Comitato Organizzatore Locae del “III Seminario Nazionale Rivelatori Innovativi”, 2012.

Attività didattica e supervisione di studenti

2017–oggi	Laboratorio di Fisica Subnucleare, Laurea Magistrale, Dipartimento di Fisica e Astronomia, Università degli Studi di Firenze.
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2011–2022

Violazione di CP, Corso di Dottorato, Dipartimento di Fisica e Astronomia,
Università degli Studi di Firenze.

Publicazioni

Oltre 400 pubblicazioni su riviste internazionali peer-reviewed e lavori di collaborazione.

GIACOMO GRAZIANI

INFN, Sezione di Firenze $\diamond$ via Sansone 1, 50019 Sesto Fiorentino (FI), Italy



INCARICHI PROFESSIONALI

- dal 2020: Primo ricercatore presso Istituto Nazionale di Fisica Nucleare (INFN), Sezione di Firenze. Coordinatore della Linea Scientifica 1 presso la Sezione di Firenze dell'INFN (2021- 2024)
- 2004 - 2019: Ricercatore presso Istituto Nazionale di Fisica Nucleare (INFN), Sezione di Firenze. Responsabile locale della sigla LHCb (2007-2021)
- 2006 - 2014: Professore a contratto presso Università di Firenze, Dipartimento di Matematica.
- 2003 - 2004: Ricercatore post-doc presso CEA Saclay (Francia).
- 2001 - 2003: Ricercatore post-doc tramite *Marie Curie individual fellowship* presso Laboratoire de l'Accélérateur Linéaire, Orsay (Francia).
- 2000 - 2001: Ricercatore post-doc presso Università di Firenze.

FORMAZIONE

- Dottorato in Fisica, Università di Firenze (1997 - 2000).
- Laurea in Fisica, Università di Firenze (1995). *Votazione: 110 e lode.*

ATTIVITÀ DI RICERCA

Dal 2004: Fisica del sapore e fisica adronica con l'esperimento LHCb al CERN:

- membro del *Collaboration Board* (2017 - 2024);
- membro del *RTA project Institutional Board* (dal 2018);
- membro del *Editorial Board* (2012 - 2014);
- fra i principali promotori della fisica a bersaglio fisso con fasci di LHC:
 - convener, alla sua creazione, del gruppo che coordina le analisi relative alla fisica con fasci di ioni pesanti o con bersaglio fisso (2016 - 2019);
 - rappresentante di LHCb nel *Physics Beyond Colliders Study Group* (2017-2021). Primo autore della proposta di programma di fisica con il target SMOG2 nel Run 3 di LHCb [7][10];
 - membro del *LHCb Fixed Target Panel* (dal 2016);
 - primo autore della prima misura in bersaglio fisso ad LHC sulla produzione di antiprotoni in collisioni protone-elio [12] (2018).
- Stati adronici pesanti:
 - fra gli autori principali della scoperta del tetraquark compatto con 4 quark c [4] (2020);
 - proponente della misura di vita media della B_c in decadimenti semileptonici [15] (2014).
- Fisica del sapore con mesoni K:
primo autore per la ricerca di nuova fisica nel decadimento $K_S \rightarrow \mu^+ \mu^-$ [13] (2017).
- Fra i principali esperti del rivelatore di muoni utilizzato nei Runs 1 e 2 di LHCb [14][17].
- Fra i principali sviluppatori del framework di online monitoring di LHCb.

2012 - 2018: Caratterizzazione del fascio γ della facility ELI-NP:

- fra i principali ideatori del sistema di caratterizzazione del fascio per la proposta *Eurogammas*, vincitrice del bando europeo per la realizzazione della sorgente gamma ELI-NP a Magurele (Romania) [16];
- inventore dell'innovativo metodo calorimetrico per la misura simultanea dell'energia e dell'intensità del fascio.

2003 - 2004: Fisica del sapore con l'esperimento BaBar a SLAC:

misura del decadimento $B^0 \rightarrow \rho^0 \rho^0$ per la determinazione dell'angolo α del triangolo di unitarietà [18].

2002 - 2003: Calorimetria elettromagnetica nell'esperimento ATLAS al CERN:

sviluppo della ricostruzione dell'energia nel calorimetro LAr con metodi innovativi [19,20].

1997 - 2002: Fisica del sapore con l'esperimento NA48 al CERN:

fra i principali autori dell'analisi che ha portato alla scoperta della violazione diretta della simmetria CP nei decadimenti dei kaoni neutri [21,22].

1995 - 1997: Fisica dei neutrini con l'esperimento NOMAD al CERN:

sviluppo ex novo della ricostruzione temporale del calorimetro elettromagnetico.

ESPERIENZA DI INSEGNAMENTO E SUPERVISIONE DI STUDENTI

- Docente per studenti di dottorato in fisica all'Università di Firenze (2021-2022).
- Professore di statistica e tecniche di analisi dei dati per studenti di matematica all'Università di Firenze (2006 - 2014).
- Supervisore del progetto di ricerca post-dottorato sulla produzione doppia di J/ψ con dati LHCb di An Liupan, beneficiaria di una borsa di studio post-dottorato INFN (2018-2020). Il lavoro ha portato alla scoperta del primo candidato di tetraquark a 4 charm [4].
- Supervisore di tre progetti di dottorato presso l'Università di Firenze:
 - C. Lucarelli (2024). Il lavoro ha portato alla prima identificazione di deutoni in LHCb [1] e a significativi sviluppi delle possibilità di fisica con il bersaglio SMOG2. È stato premiato con l'*Early Career Scientist award 2024* e con il *Thesis Award 2025* dalla collaborazione LHCb;
 - S. Mariani (2022). Il lavoro ha portato alla prima misura di antiprotoni da anti-iperoni in collisioni protone-elio [2,3] e a significativi sviluppi delle possibilità di fisica con il bersaglio SMOG2. È stato premiato con il *Conversi award 2022* dall'INFN, la *Ettore Pancini grant 2022* dalla Società Italiana di Fisica (SIF), l'*Early Career Scientist award 2022* e il *Thesis Award 2023* dalla collaborazione LHCb;
 - L. Anderlini (2015). Il lavoro ha portato a una misura di precisione della vita media del mesone B_c [15]. È stato premiato con il *premio Conversi 2015* dall'INFN e con il *Thesis Award 2016* dalla collaborazione LHCb;

oltre a quattro tesi di laurea triennale o magistrale nel gruppo LHCb.

PUBBLICAZIONI

Autore di oltre 900 pubblicazioni a ottobre 2025, con *h-index* pari a 146 secondo il database Inspire-hep.

Pubblicazioni più significative:

- [1] R. Aaij *et al.* [LHCb Collaboration], “Deuteron identification via time of flight with LHCb,” arXiv:2508.06305

- [2] G. Graziani, L. Anderlini, S. Mariani, E. Franzoso, L. L. Pappalardo and P. di Nezza, “A Neural-Network-defined Gaussian Mixture Model for particle identification applied to the LHCb fixed-target programme,” JINST **17** (2022) no.02, P02018
- [3] R. Aaij *et al.* [LHCb Collaboration], “Measurement of antiproton production from antihyperon decays in $p\text{He}$ collisions at $\sqrt{s_{NN}} = 110\text{ GeV}$,” Eur. Phys. J. C **83** (2023) no.6, 543
- [4] R. Aaij *et al.* [LHCb Collaboration], “Observation of structure in the J/ψ -pair mass spectrum,” Sci. Bull. **65** (2020) no.23, 1983-1993
- [5] G. Graziani [LHCb, ATLAS and CMS Collaborations], “Heavy ion and fixed-target physics at ATLAS, CMS and LHCb,” Nuovo Cim. C **42** (2020) no.6, 248
- [6] G. Graziani [LHCb Collaboration], “Results on heavy ion physics at LHCb,” J. Phys. Conf. Ser. **1271** (2019) no.1, 012008
- [7] R. Alemany *et al.* “Summary Report of Physics Beyond Colliders at CERN,” arXiv:1902.00260
- [8] A. Dainese *et al.* [QCD Working Group], “Physics Beyond Colliders: QCD Working Group Report,” arXiv:1901.04482
- [9] G. Graziani *et al.* “Physics opportunities with the fixed-target program of the LHCb experiment using an unpolarized gas target,” LHCb-PUB-2018-015 [<http://cds.cern.ch/record/2649878>]
- [10] Z. Citron *et al.* “Report from Working Group 5: Future physics opportunities for high-density QCD at the LHC with heavy-ion and proton beams,” CERN Yellow Rep. Monogr. **7** (2019), 1159-1410 [doi:10.23731/CYRM-2019-007.1159](https://doi.org/10.23731/CYRM-2019-007.1159)
- [11] A. Cerri *et al.* “Report from Working Group 4: Opportunities in Flavour Physics at the HL-LHC and HE-LHC,” CERN Yellow Rep. Monogr. **7** (2019), 867-1158 [doi:10.23731/CYRM-2019-007.867](https://doi.org/10.23731/CYRM-2019-007.867)
- [12] R. Aaij *et al.* [LHCb Collaboration], “Measurement of Antiproton Production in $p\text{He}$ Collisions at $\sqrt{s_{NN}} = 110\text{ GeV}$,” Phys. Rev. Lett. **121** (2018) no.22, 222001
- [13] R. Aaij *et al.* [LHCb Collaboration], “Improved limit on the branching fraction of the rare decay $K_S^0 \rightarrow \mu^+ \mu^-$,” Eur. Phys. J. C **77** (2017) no.10, 678
- [14] R. Aaij *et al.* [LHCb Collaboration], “LHCb Detector Performance,” Int. J. Mod. Phys. A **30** (2015) no.07, 1530022
- [15] R. Aaij *et al.* [LHCb Collaboration], “Measurement of the B_c^+ meson lifetime using $B_c^+ \rightarrow J/\psi \mu^+ \nu_\mu X$ decays,” Eur. Phys. J. C **74** (2014) 2839
- [16] O. Adriani *et al.*, “Technical Design Report: EuroGammaS proposal for the ELI-NP Gamma beam System”, arXiv:1407.3669 (2014)
- [17] A. A. Alves, Jr. *et al.*, “Performance of the LHCb muon system,” JINST **8** (2013) P02022
- [18] B. Aubert *et al.* [BABAR Collaboration], “Limit on the $B^0 \rightarrow \rho^0 \rho^0$ branching fraction and implications for the CKM angle α ”, Phys. Rev. Lett. **94**, 131801 (2005)
- [19] M. Aharrouche *et al.* [ATLAS Electromagnetic Barrel Calorimeter Collaboration], “Energy linearity and resolution of the ATLAS electromagnetic barrel calorimeter in an electron test-beam”, Nucl. Instrum. Meth. A **568** (2006) 601
- [20] G. Graziani, “Precision linearity studies of the ATLAS liquid argon EM calorimeter”, in “Calorimetry in particle physics”, 391–397. World Scientific, 2004. ISBN: 981-256-272-9
- [21] J. R. Batley *et al.* [NA48 Collaboration], “A precision measurement of direct CP violation in the decay of neutral kaons into two pions”, Phys.Lett.B**544** (2002) 97
- [22] G. Graziani, “Measurement of direct CP violation with the NA48 experiment at CERN”, tesi di Dottorato, Università di Firenze, 30 dicembre 1999

ALTRI TITOLI

- Autore di oltre 40 contributi su invito a conferenze e workshop internazionali, tra cui *Initial Stages* (2025), *Large Hadron Collider Physics Conference LHCP* (2023, 2012), *EPS-HEP* (2019), *Les Rencontres de Physique de la Vallée d'Aoste - La Thuile* (2019), *International Cosmic Ray Conference ICRC* (2017), *Rencontres de Moriond – Electroweak Interactions and Unified Theories* (2017, 2002, 2000).
- Revisore per le seguenti riviste internazionali: *Physics Letters B*, *Journal of High Energy Physics (JHEP)*, *The European Physical Journal C*, *Journal of Instrumentation (JINST)*, *IEEE Transactions on Nuclear Science*.
- Membro di comitati locali o scientifici per diversi workshop e conferenze di fisica delle alte energie, fra cui BEACH2026 e IF AE2024. Membro del Comitato scientifico e docente alla Winter School of High Energy Physics di Nablus, Palestina (2018, 2019).