PERSONAL INFORMATIONS

Family name, First name:	Prof. Dr. Lenisa, Paolo
Researcher unique identifier(s):	orcid.org/0000-0003-3509-1240
Date of birth:	June 17, 1965
Nationality:	Italian

EDUCATION

2014	Italian National Scientific Habilitation as *Associated Professor* and *Full Professor* in: - Experimental Physics of Fundamental Interactions - Nuclear and Sub-nuclear Physics
1997	PhD in Physics (excellent). Title of the thesis *"Development of a novel laser system for laser cooling of ions in a storage ring"* University of Ferrara, Ferrara, Italy
1992	Master Degree in Nuclear Engineering (summa cum laude) Politecnico di Milano, MI(IT)

CURRENT POSITION

Since 2017	Full professor in Nuclear and Subnuclear Physics Dipartimento di Fisica e Scienze della Terra, Università di Ferrara, Ferrara (IT)

PREVIOUS POSITIONS

2014 – 2017	Associate professor in Experimental Physics of Fundamental Interactions Dipartimento di Fisica e Scienze della Terra, Università di Ferrara, Ferrara (IT)
1998 – 2014	Researcher Staff- Physics Department, University of Ferrara, Ferrara (IT)
1997 – 1998	Guest Scientist - Max-Planck Institut für Kernphysik, Heidelberg (D)

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

Since 2000	15 Postdocs, 11 PhDs, 20 Diploma and Master Students Department of Physics and Earth Science, University of Ferrara, Ferrara (IT)

TEACHING ACTIVITIES

Since 2017	Course: *Subatomic Physics*, Univ. of Ferrara (IT)
Since 2014	Course: *General Physics (Mechanics),* Univ. of Ferrara, Ferrara (IT)
2015	Lecture: *The history of motion and its impact on the evolution of the scientific thought* – XV Edizione Incontri di Fisica, LNF Frascati, Italy
2014	Lecture: *Silicon Detectors in Particle Physics,* 6th Georgian-German School in Basic Science, Tbilisi, Georgia
2012 – 2015	Course: *Epistemology and History of Physics*, University of Ferrara, Ferrara, Italy
2000 – 2014	Course: *General Physics I (Mechanics)*, University of Ferrara, Ferrara, (IT)
2005	Lectures: *Polarization in Storage Rings,* PhD School on Detectors, Villa Gualino (TO), (IT)
1999 – 2000	Course: *General Physics II (Electromagnetism)*, University of Ferrara, Ferrara (IT)

INSTITUTIONAL RESPONSIBILITIES

2019	Director of the Interdisciplinary Training Course for High-School Teachers*"Science for Environment and Sustainable Development",* University of Ferrara (IT)
Since 2017	*Coordinator of the Physics Course* (Dean of the Physics Faculty) Univ. Ferrara (IT)
Since 2017	Coordinator of the educational program for the High-School teachers in Physics University of Ferrara, (IT)
2015	Co-chair of the International PhD School in Physics Niccolò Cabeo: "*Infinities"*, University of Ferrara (IT)
2014	Co-chair of the International PhD School in Physics Niccolò Cabeo: "*Vacuum and Broken Symmetries: from the Quantum to the Cosmos"*, University of Ferrara (IT)
2013	Co-chair of the International PhD School in Physics Niccolò Cabeo: *"Physics beyond the Standard Model: the Precision Frontier"*, University of Ferrara (IT)
Since 2013	Coordinator for the student orientation program in Physics, University of Ferrara (IT)
Since 2005	Member of the PhD Teachers College in Physics, University of Ferrara (IT)

ORGANIZATION OF SCIENTIFIC MEETINGS (Selection)

2018 Chair: *"SPIN2018"* - 23rd International Spin-Physics Symposium, 250 participants, Ferrara (IT)

2015 Co-chair: *"Search for the Electron EDM in an Electrostatic Storage Ring "* - International Workshop - 50 participants, Mainz (D)

2013 Chair: "*Nuclear Fusion with Polarised Nucleons"* – Intern. Workshop, 20 participants, ECT* TN(IT)
2009 Chair: "*PST2009"* - XIII International Workshop on Polarised Sources and Targets, 100 participants, Ferrara (IT)
2008 Chair: *"Transversity 2008"* - 2nd International Workshop on Transverse Polarisation Phenomena in Hard Processes, 90 participants, Ferrara (IT)
2008 Co-chair: *"Polarised Antiprotons"* - International Workshop, 30 participants, Bad Honnef (D)

REVIEWING ACTIVITIES

From 2021 Elected Chair of the International Spin Physics Committee (ISPC)
Since 2017 Chair of the Graduation Commissions for Master and Bachelor Degrees in Physics, University of Ferrara (IT)
Since 2017 Member of the Physics and Earth Science Department Board -Univ. Ferrara (IT)
Since 2017 Chair of Steering Committee of the Course in Physics – Univ. Ferrara (IT)
Since 2017 Chair of the Review Team of the Course in Physics – Univ. Ferrara (IT)
2017 Evaluator, Italian Ministry of Research and Education (MIUR) project FARE (IT)
Since 2017 National responsible for the INFN-financed project JEDI
2016 Evaluator, Italian Ministry of Research and Education (MIUR) VQR-2011-14 (IT)
Since 2015 Member of the Editorial Board of "*ScienzaPerTutti"*, INFN-website for Physics Dissemination (IT) (http://scienzapertutti.lnf.infn.it)
Since 2012 Member of the International Spin Physics Committee (ISPC)
2012 - 2019 Member of the National Scientific Commission 3 (CSN3 - Nuclear Physics), INFN (IT)
2012 - 2019 Referent for Hadron Physics sector of INFN – National Scientific Commission 3
2005 - 2017 National responsible for the INFN-financed project PAX
Since 2005 Reviewer for Nuclear Instruments and Methods, European Physical Journal, Progress in Particle and Nuclear Physics, European Physics Letters

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

Since 2015 Member "*Società Italiana di Storici della Fisica e dell'Astronomia (SISFA)"*, Italy
Since 2007 Member *"Società Italiana di Fisica (SIF)"*, Italy
Since 1998 Member "*Istituto Nazionale di Fisica Nucleare (INFN)*", Italy

PUBLICATIONS, PROPOSALS, PRESENTATIONS

- Co-author of more than 240 publications in refereed journals (h-index: 40, no. of citations: 6204)
- Presenter of 48 talks at international conferences and workshops (23 on invitation)
- Proponent of 13 Experiment proposals and Letters of Intent (9 as Spokesperson).

PARTICIPATION AND LEADERSHIP IN INTERNATIONAL COLLABORATIONS

HERMES at DESY Hamburg. Coordinator of the Internal Polarized Target for the period 2000-2005 (81 joint publications).
Collaborators: Prof. Dr. K. Rith and Prof. D. E. Steffens - Univ. Erlangen-Nürnberg (Germany), Prof. Dr. D. Ryckbosh - Univ. Gent (Belgium), Dr. E. Aschenauer - BNL (USA)

PAX at COSY Jülich, (& CERN/AD). Proponent and Co-spokesperson of the Collaboration since 2005 9 joint publications).
Collaborators: Prof. Dr. H. Ströher and Dr. F. Rathmann - FZ-Jülich (Germany), Prof. Dr. H.O. Meyer - Indiana University, Bloomington (USA), Prof. A. Kulikov - JINR, Dubna, (Russia), Prof. Dr. M. Anselmino - Univ. Torino, Torino (Italy)

OLYMPUS at DORIS Hamburg. Proponent and member of the executive board 2011-2015 (3 joint publications).
Collaborators: Prof. Dr. R. Milner – MIT (USA), Prof. Dr. F. Maas - Univ. Mainz, (Germany), Prof. Dr. R. Beck - Univ. Bonn (Germany)

JEDI at COSY Jülich. Proponent and Co-spokesperson of the Collaboration since 2017, Member of the executive board since 2012 (10 joint publications)
Collaborators: Prof. Dr. J. Pretz - RWTH Aachen University, Aachen (Germany), Prof. E. Stephenson – Indiana University (USA), Prof. Dr. Y. Semertzidis - Center for Axion and Precision Physics Research, Institute for Basic Science, Daejeon (Republic of Korea)

CLAS at JLAB Newport News, member of the Collaboration since 2014 (57 joint publication)
Collaborators: Dr. P. Rossi JLAB Deputy ass. Director (USA), Prof. Dr. M. Taiuti - Univ. di Genova (Italy)

Curriculum Vitae of Laura Bandiera

PERSONAL INFORMATION

Family name, First name: Bandiera Laura

Researcher unique identifier(s) (such as ORCID, Research ID, etc. ...): 0000-0002-5537-9674

Nationality: Italian

URL for web site: https://www.researchgate.net/profile/Laura_Bandiera

- **EDUCATION**

2015 - PhD in Physics, final mark: Excellent
Department of Physics and Earth Science, University of Ferrara, Italy

2011 - Master in Physics, final mark: 110/110 cum laude - full marks with honors
Department of Physics and Earth Science, University of Ferrara, Italy

- **CURRENT/PAST POSITIONS**

Since 2017 - Research Scientist, Permanent Staff, Istituto Nazionale di Fisica Nucleare, Ferrara Unit, Italy

2015 – 2017 Research fellow, INFN, Ferrara Unit, Italy

2012 – 2015 PhD Student with scholarship, Department of Physics and Earth Science, University of Ferrara, Italy

- **VISITING**

2013 Visiting PhD Student with scholarship at the Akhiezer Institute for Theoretical Physic, Kharkov (Ukraine), working with the group led by Prof. N. Shul'ga on my PhD thesis

- **GRANTS AND RESPONSIBILITIES**

Since 2020 - Project Manager and member of the Coordination Board of the EU project Horizon2020 MSCA COFUND Fellini - *Fellowship for Innovation at INFN*

Since 2019 - National Project Leader - INFN (beneficiary) - of the EU project Horizon2020 MSCA RISE N Light - *Novel Light Sources: Theory and Experiment*. Scientific coordination of five people from INFN Ferrara for the realization and tests of crystals for radiation sources. Logistic coordination for the secondments of INFN participants to other Consortium partners

Since 2019 - PI of an INFN national project ELIOT - *ELectromagnetic processes In Oriented crysTals*. This project is born from my idea and I am coordinating the participation of about ten people from three INFN units and the relation with the MAMI (leader Dr. W. Lauth) group

Since 2018 - PI of the INFN “start up grant” OSCaR - *Oriented Scintillator CRystals* - dedicated to the study of electromagnetic processes in oriented scintillator crystals

2017 - 2019 Deputy Team Leader of the UA9 experiment at CERN for the INFN Ferrara Unit (5 people)

2016 - 2020 National Project Leader - INFN (beneficiary) - of the EU project Horizon2020 RISE PEARL - *Periodically Bent Crystals for Crystalline Undulators*. Scientific coordination of six people from INFN Ferrara for the realization and tests at ESRF of periodically bent crystals. Logistic coordination for the secondments of INFN participants to other Consortium partners

2017-2019 Local INFN Team Leader for the Ferrara Unit (five people) of the FP7 ERC CoG CRYSBEAM project - *Crystal channeling to extract a high energy hadron beam from an accelerator*

Since 2020 - Representative of the researches, INFN Ferrara Unit

2012 - 2015 Representative of the PhD students in Department of Physics and Earth Science, Ferrara University

2009 - Representative of the students in the Equal Opportunities Commission, Ferrara University

- **TEACHING AND OUTREACH ACTIVITIES**

Since 2019 - Organizer of the “Corso di Eccellenza” at the Physics and Earth Science Department of Ferrara University, consisting in seminars on physics dedicated to high-school students

2018 and 2020 Lecturer at the PhD Program in Physics - course of "Innovative x and gamma sources and their applications", Department of Physics and Earth Science, University of Ferrara, Italy

2012-16 Teaching Assistant for various courses on General Physics at the Department of Engineering, University of Ferrara, Italy

Since 2015 - Lecturer for educational courses in Physics open to the public for different cultural institutions

Since 2015 - Editor of the INFN Popular Science Website “INFN Scienza Per Tutti”

Since 2015 - Member of the project “Fisici Senza Frontiere” to promote science education in schools

- **ORGANISATION OF SCIENTIFIC MEETINGS/CONFERENCES**

2020 - Member of the Organizing Committee of the International Conference “Channeling 2020”, Riccione, Italy

2020 - Member of the Organizing Committee of the International Conference “Dyson 2020”, Santa Margherita Ligure, Italy

2018 - Member of the Organizing Committee of the International Conference “Channeling 2018” and Chair of Section “Charged Beams Shaping & Diagnostics”, Ischia (NA), Italy

2018 - Organizer of the national meeting on “Production and characterization of crystals for particle beam manipulation”, INFN Ferrara Unit, Italy

2017 - Member of the Organizing Committee of the H2020-PEARL 2017 Workshop and Mid-Term Review, Department of Physics and Earth Science of Ferrara University,Italy

2017 - Organizer of the “Training course on multiscale computational methods for complex molecular systems", Department of Physics and Earth Science of Ferrara University, Italy

- **RESEARCH PERFORMANCE**

More than 60 scientific papers in international peer-review journals.
More than 20 presentations at conferences and meetings. Tutor of 1 bachelor candidate. Supervisor of 1 PhD student and 2 Post Doc. Advisor of three doctoral candidates, a scholarship holder and two research fellows. Local supervisor of 2 INFN researchers and 1 INFN postDoc.

Selected 5 publications

[1] L. Bandiera, et al., Phys. Rev. Lett. 111 (2013) 255502, “Broad and Intense Radiation Accompanying Multiple Volume Reflection of Ultrarelativistic Electrons in a Bent Crystal”

[2] L. Bandiera, et al., Phys. Rev. Lett. 115 (2015) 025504., “Investigation of the electromagnetic radiation emitted by sub-GeV electrons in a bent crystal”

[3] L. Bandiera, et al., Eur. Phys. J. C 76 (2016) 80, “Relaxation of axially confined 400 GeV/c protons to planar channeling in a bent crystal”

[4] L. Bandiera, et al., Phys. Rev. Lett. 121 (2018) 021603, “Strong Reduction of the Effective Radiation Length in an Axially Oriented Scintillator Crystal”

[5] W. Scandale et al., Phys. Lett. B 758 (2016) 129, “Observation of channeling for 6500 GeV/c protons in the crystal assisted collimation setup for LHC”

Selected Invited presentations at International Conferences and Schools

1. ”*Bent crystals as a tool for electron beams manipulation*”, DYSON 2016, Bad Ems (Germany)

2. “*Strong reduction of the effective radiation length in an axially oriented PWO crystal*”, RREPS 2017, DESY (Germany)

3. "*Experimental study of electron beams interaction with crystalline material and their applications*” IVth International School-Conference - Actual Problems of Microworld Physics 2018 - Grodno (Belarus)

4. “*Strong reduction of the effective radiation length in an axially oriented scintillator crystal*”, CHANNELING 2018, Ischia (Na, Italy)

5. ”*Experimental investigation of the electromagnetic radiation emitted by sub-GeV electrons in a bent crystal*”, DYSON 2018, Potsdam (Germany)

I have also given several Invited Seminars at National and International Institutes (MPI NP Heidelberg, SLAC, CERN, LAL Orsay, Akhiezer Institute for Theoretical Physics, Kharkov University, Roma “La Sapienza”)

- **AWARDS**

2018 - “Abilitazione Scientifica Nazionale” - Habilitation to become Associate Professor in Physics

2016 - "Premio Sapio Ricerca 2016" - National Award. Assigned during a Ceremony at Palazzo Montecitorio - Italian Parliament

2016 - "Diploma of best doctoral thesis in Ferrara Physics Doctorate School" assigned by IUSS Ferrara 1391

2016 - Medal of Honor of the City of Cento for the Scientific Research Achievements

2015 - Mention "Nicolò Copernico" for innovative doctoral thesis in the field of science and technology. Local Award assigned by the Scientific Committee of the “Premi Natta e Copernico”

2014 - Best Poster Award at the International Conference “Channeling 2014”

- **EDITORIAL ACTIVITY**

Reviewer for the scientific journals "European Physical Journal C", “Physical Reviews Accelerators and Beams”, “Physics Letters A”,"Nuclear Instruments and Methods in Physics Research B”, and “Journal of Instrumentation”.

Summary of research activity

My research activity has been mostly dedicated to the study of coherent interactions of particles with oriented crystals for applications in beam manipulation, e.g. beam collimation/extraction via channeling in bent crystals and for realization of intense radiation sources. I started this activity during my Master thesis in the INFN Ferrara Unit and I continued during my PhD and PostDoc period. My work was mainly connected with data analysis of experiments done in international facilities, such as CERN, MAMI in Germany, SLAC in the US, where I participated and coordinated many experimental tests. Furthermore, since my PhD I have been engaged in phenomenological and theoretical studies on coherent interactions in crystals. Indeed, I collaborated on the development of a Monte Carlo algorithm to compute e.m. processes in oriented crystals that was used to interpret experimental data and to design novel experiments, which led to original results published in high-ranking journals. More details can be found in the following sections.

Beam manipulation (since 2012)

In the framework of the UA9 experiment at CERN, which is dedicated to the investigation of using bent crystals as primary collimators for the LHC. I took part in several data taking campaigns on the extracted H8 line at CERN SPS and I was responsible for the H8 data analysis to estimate the INFN crystals deflection capability. My analysis has been fundamental for the selection of the INFN candidate crystals for the LHC collimation. One of the Ferrara crystals was successfully exploited for the first time as primary collimator at the LHC [5].

Since my visit to the Akhiezer Institute of Theoretical Physics (Ukraine) in 2013, I have collaborated with the group of N. Shul’ga on theoretical investigation on the axial channeling of ultrarelativistic positive and negative particles in bent crystals as powerful tool for beam steering in particle accelerators [3].

I also took part of two ERC projects: the CRYSBEAM (2014-2019) and SELDOM (2018-now) projects. The first one was dedicated to the exploitation of bent crystals to realize an extracted beamline from the LHC. The second one explores a new experimental method based on bent crystals to boost the study of the electric dipole moment (EDM) and magnetic dipole moment (MDM) of unstable particles at the LHCb experiment at CERN. For both projects, my main task has been data analysis of the bent crystals tested on the extracted lines of SPS.

Intense e.m. radiation generation (since 2011)

Beyond the manipulation of charged particle beams, my research activity has been mostly dedicated to the investigation of the possible exploitation of the high-intensity radiation generation in bent crystals for collimation of future electron and positron colliders and for

innovative gamma-ray sources. In collaboration with V. Tikhomirov of the INP (Minsk) I developed a Monte Carlo algorithm based on the Baier-Katkov formula for the computation of the e.m. radiation emitted by charged particles in an oriented crystal. This algorithm has been successfully exploited to design different experiments. The most interesting results were achieved in two experiments: one at CERN with 120 GeV electrons [1] and another one at MAMI with 855 MeV electrons that measured for the first time the radiation emitted under multiple and single volume reflection in bent crystals, respectively [2].

Detector physics based on oriented crystals (since 2016)

Recently, I expanded my interest to applications of coherent interactions in oriented crystals in detector physics. First of all, I was involved by the KLEVER project (a future proposal for NA62 at CERN) to design and coordinate a test beam on the H2 line of SPS to demonstrate the feasibility of a W crystalline gamma-converter with reduced radiation length, to be exploited in front of the Small Angle Calorimeter. Secondly, I proposed an experiment on the H4 line of SPS with 120 GeV electrons that measured a strong reduction of the radiation length in an oriented scintillator crystal. We demonstrated for the first time the possibility to reduce of a factor of five the radiation length in a PWO crystal axially oriented with the beam direction [4]. I was funded by INFN to continue this work with oriented scintillator crystals within the OSCaR project and the ELIOT experiment. The main goal of the OSCaR project and the ELIOT experiment is to investigate the bremsstrahlung radiation enhancement produced by $e^{\pm}$ in crystalline materials normally used in detector physics. The novelty of this idea is to exploit oriented crystals to realize more compact detectors if compared to the state of the art, to be implemented in current and future experiments in particle and nuclear physics or gamma astronomy, with the possibility to open a new field of applications for oriented crystals, other than the traditional ones on beam manipulation and radiation sources.

Scientific leadership

For the UA9 experiment at CERN, I was the INFN data analysis coordinator and the co-organizer for the INFN participation for the SPS H8 beam tests.

Furthermore, I have a long experience as Run and Technical coordinator of beam tests with crystals carried out at different facilities (CERN SPS H2/H4 lines since 2014; MAMI B since 2013; DESY TB facility since 2018) in the framework of INFN national experiments. I planned the radiation measurements, designed the setup and selected a priority list for measurements. I also coordinated the Ferrara people participation during the tests. Since 2016, as INFN leader for the H2020-MSCA-RISE PEARL project, in which several EU and Non-EU institutes took part with the aim of realizing a crystalline undulator as an innovative X- or gamma-ray source, I planned and coordinated the bent and periodically bent crystals design, experimental tests, Monte Carlo simulations and scientific writing. I analysed and interpreted the experimental results taken at MAMI and CERN, and coordinated PhD students and PostDocs participation in the project. Our main achievement was the realization of the thinner bent crystals never realized and its test for beam steering capability at the MAMI B facility. Within this project, I also organize the work of visiting Experienced (V. Tikhomirov) and Early Stage Researchers coming from the

INP of Minsk. The success of the PEARL project led the Commission to finance a new RISE project, i.e. the N-LIGHT, starting in 2020.
Since 2019, as PI of OSCaR and ELIOT financed by INFN, I am in charge for the experiment planning, setup design, and crystals selection. I also coordinate the data analysis and Monte Carlo simulations.

Ferrara, *lì* 22/06/2020

Curriculum Vitae et Studiorum

Personal Details

Name: **Luca Pagano**
Present Education: Ph.D. in Astronomy
Present Work position: Researcher at University of Ferrara (RTDb)
Nationality: Italian
E-Mail: pagano@fe.infn.it, lu.pagano@gmail.com
Professional Address: University of Ferrara, Dipartimento di Fisica e Scienze della Terra, Via Saragat 1, 44122 Ferrara (Italy)
Skype Account: luca837

Personal Profile

- Work experience as researcher in cosmology and fundamental physics since 2006
- Active in theory, phenomenology and data science
- Consolidated experience as programmer in Fortran, C, C++ and Python

Current Position

September 2019 - Now Researcher at University of Ferrara (RTDb). Main topics: Cosmological constraints on fundamental physics and CMB data analysis.

International Collaborations

2008-now Member of the data analysis Core Team of Planck Satellite and Planck Scientist. Team leader of the large scale polarization analysis and corresponding author of the 2018 Likelihood paper. Responsible for LFI Beam window functions for the 2013 and 2015 releases. Responsible for the effective beam computation and signal Montecarlo for the 2015 release. Worked also on the cosmological parameter estimation, in particular: reionization parameters and BBN parameters.

2011-now Member of the LSPE collaboration. Responsible and maintainer of the simulation pipeline for the SWIPE instrument. Worked on the cosmological parameter estimation: reionization parameters and B-modes. Since 2019 local coordinator for INFN-Fe.

2018-now Member of EUCLID collaboration, working on likelihood for CMB-Galaxy cross-correlation. Member of LiteBIRD collaboration, working on simulation framework and large scale polarization. Member of PRISTINE collaboration, responsible of the scanning strategy.

Work Experience

September 2018 - September 2019 Researcher at University of Ferrara (RTDa). Main topics: Cosmological constraints on fundamental physics and CMB data analysis.

April 2016 - August 2018 Postdoc at Institut d'Astrophysique Spatiale (IAS), Univ. Paris-Sud. Main topic: calibration and systematics characterization of Planck Satellite. Supervisors: Dr. J.-L. Puget and Dr. L. Vibert. Since September 2016, CNES (Centre national d'études spatiales) fellowship.

November 2011 - March 2016 Postdoc at University of Rome "Sapienza". Main topic: algorithm development for the Planck Satellite and the LSPE balloon. In particular: Effective Beam computation, Bolometric Transfer Function estimation and Likelihood function and Cosmological Parameter estimation. Supervisors: Prof. P. de Bernardis, Prof. F. Piacentini and Prof. A. Melchiorri.

November 2010 - October 2011 Research Scholar at California Institute of Technology (Caltech) and NASA Jet Propulsion Laboratory (JPL). Main topic: data analysis for the Planck Satellite. In particular: Effective Beam computation, Power Spectrum Estimation (PSE) and Likelihood function, Foreground Removal and Cosmological Parameter estimation. Supervisor: Dr. K.M. Gorski.

Fall 2008 - Spring 2010 Visiting researcher at Caltech and NASA/JPL under the supervision of Dr. Graca Rocha and Dr. Krzyszof Gorski, work on beam transfer function, PSE and Foreground removal for the Planck satellite.

Summer 2006 - Spring 2007 Master Student with project on "Detection of gravitational waves from future measurements of CMB anisotropy and polarization" under the supervision of dr. Alessandro Melchiorri and in collaboration with Prof. M. Kamionkowski (California Institute of Technology) and Prof. A. Cooray (University of Irvine California). Three months visit period at Caltech.

Education

2015 High school teaching habilitation (TFA: Tirocinio Formativo Attivo) in Mathematics and Physics (Class: A049 - now A027) on July 16, 2015 with marks 97/100. Six month internship at Liceo Scientifico Statale "Nomentano".

2007-2010 Ph.D. in Astronomy at University of Rome "Sapienza" on January 11, 2011. Thesis' title: *Constraining the Cosmological Scenario with Current and Future Cosmic Microwave Background measurements*. Under the supervision of Dr. Alessandro Melchiorri.

2004-2007 Master degree in Physics and Astrophysics at University of Rome "Sapienza" on May 29, 2007 with marks 110/110 with magna cum laude. Thesis' title: *Detection of gravitational waves from future measurements of CMB anisotropy and polarization*. Under the supervision of Dr. A. Melchiorri.

Teaching Experience

2019-now Relativity course (6 CFU) for Laurea Magistrale (Master degree) in Physics at University of Ferrara.
2019-now Metodi matematici per l'economia (Mathematical methods for economy) course (8 CFU) for Laurea Triennale (three-year degree) in Economy at University of Ferrara.
2015 Three months tutor of Mathematics for OFA (Obbligo Formativo Aggiuntivo) course.
2015 Six months internship at high school Liceo Scientifico Statale "Nomentano", teaching Mathematics and Physics.
2014 Electromagnetism course assistant at University of Rome "Sapienza". Course holder: Prof. D.Trevese
2002-2006 Scholarship for technical support in Laboratory of Physics University of Rome "Sapienza".

Prizes

2007 Recipient of the fellowship: "Borsa tesi all'estero" of University of Rome "Sapienza"
2016 Recipient of the CNES (Centre national d'études spatiales) Fellowship. Project title: Legacy of Planck Polarization
2018 Winner of the Gruber prize as member of the Planck Team

Highlights

2018 Leader of the Work Package 7-6X1.5 Nucleosynthesis of the Project COSMOS, an ASI funded project to design the CMB roadmap in Italy
2018-now National Scientific Qualification (ASN) as associate professor for 02/C1 - Astronomia, astrofisica, fisica della terra e dei Pianeti

2018-now National Scientific Qualification (ASN) as associate professor for 02/A2 - Fisica teorica delle interazioni fondamentali
2010-Now Referee for Journal of Cosmology and Astroparticle Physics (JCAP), Physical Review and Monthly notices of the royal astronomical society (MNRAS)

Languages

Italian: mother tongue
English: advanced, verbal and written
French: basics

Software and Programming skills

- Fortran 2008, C, C++, Python, Bash scripting (advanced). Java, Perl (basic)
- Linux, MacOSX and Windows operating systems
- Microsoft Office Package: Word, Excel, Powerpoint
- IDL Language, MatLab, Mathematica, XMgrace, Gnuplot
- Cosmological packages: COSMOMC, CMBFAST, CAMB, CMBEASY, CLASS

Students

- Supervisor of Bachelor Degree Thesis: Elisa Bellantoni and Federico Boarin
- Co-supervisor of Master Degree Thesis: Antonella Palmese and Elisabetta Giuliani
- Co-supervisor of PhD Thesis: Martina Gerbino

Bibliometrics

inSpire:
h-index: 61
175+ publications (144+ refereed)
Total citations: > 37000
Number of papers cited 100+ times: 46
Number of papers cited 10+ times: 128
(source: inSPIRE)
Scopus:
h-index: 44
156 publications
Total citations: 18156
(source: Scopus)
Web of Science:
h-index: 58
145 publications
Total citations: 21098, (without self citations 18619)
(source: WOS)

Scientific Records

- Over 170 scientific publications.
- Over 40 talks given in public conferences and Collaboration meetings.

Curriculum Vitae

Concezio Bozzi

Impieghi :

1. Dirigente di Ricerca INFN di primo livello professionale
   Istituto Nazionale di Fisica Nucleare, Sezione di Ferrara, da 06/2019
2. Project Associate
   CERN, Ginevra, Svizzera, 08/2016 – 07/2019
3. Scientific Associate
   CERN, Ginevra, Svizzera, 08/2015 – 07/2016
4. Primo Ricercatore INFN di secondo livello professionale
   Istituto Nazionale di Fisica Nucleare, Sezione di Ferrara, 01/2007 – 05/2019
5. Professore a contratto
   Università degli Studi di Ferrara, dall'a.a. 2004/2005 all'a.a. 2014/2015
6. Ricercatore INFN di terzo livello professionale
   Istituto Nazionale di Fisica Nucleare, Sezione di Ferrara, 12/1998 – 12/2006
7. Borsa di studio per attività di Ricerca Post-Dottorato
   Università di Pisa, Gennaio 1997 – Dicembre 1998

Titoli di studio :

1. Diploma di Dottore di Ricerca in Fisica
   Università di Pisa, Ottobre 1996
   Tesi: "Studio dei decadimenti semileptonici dei mesoni B in stati $D^0\pi^+$ e $D^{*+}\pi^-$ con l'apparato ALEPH"
   Tutore: Prof. Lorenzo Foà
2. Diploma di Laurea in Fisica, voto 110/110 e lode
   Università di Pisa, 16 Luglio 1992
   Tesi: "Misura delle oscillazioni B-$\overline{\text{B}}$ nei decadimenti della Z con il rivelatore ALEPH"
   Relatore: Prof. Lorenzo Foà
3. Diploma di Maturità Scientifica, voto 60/60
   Liceo Scientifico F. Masci, Chieti, A.S. 1986/1987

Sommario dell'attività scientifica :

- Fisica elettrodebole e dei sapori pesanti alla scala del bosone vettore Z^0 (esperimento ALEPH al collisore LEP del CERN, Ginevra)
- Fisica dei sapori pesanti e violazione della simmetria CP nel settore del B (esperimenti BaBar al collisore PEP-II di SLAC, USA e LHCb al collisore LHC del CERN, collaborazione Heavy Flavour Averaging Group, HFLAV)
- Ricerca e sviluppo di rivelatori di silicio a microstrisce (esperimenti ALEPH, CMS al collider LHC del CERN, BaBar), a pixel monolitici (progetto P-ILC) e 3D con informazione temporale (progetto TIMESPOT)
- Calcolo scientifico, con particolare riguardo a simulazioni computazionali e calcolo distribuito (ALEPH, CMS, BaBar, LHCb, progetto INFN GRID)
- Autore o coautore di oltre 1200 pubblicazioni in riviste internazionali di fisica che prevedono processo di revisione tra pari. H-index: 80 (fonte: Thomson Reuters Web of Science)
- Organizzazione, gestione e responsabilità di risorse di calcolo italiane e di esperimento (BaBar, LHCb)
- Partecipazione e incarichi di responsabilità in gruppi di di ricerca degli esperimenti internazionali BaBar, P-ILC e LHCb e della collaborazione HFLAV.
- Incaricato di ricerca (Scientific e Project Associate) presso i laboratori del CERN di Ginevra, con il compito di coordinare un gruppo di lavoro di analisi, e di organizzare e coordinare le attivitá di ricerca e sviluppo del calcolo scientifico per l'upgrade dell'esperimento LHCb.
- Partecipazione come relatore in circa 30 convegni scientifici nazionali o internazionali.

Sommario dell'attività di coordinamento :

- partecipazione a comitati scientifici e/o comitati organizzatori di quattro conferenze internazionali, di una serie di conferenze nazionali, una serie di conferenze internazionali, di due scuole avanzate internazionali.
- Partecipazione e incarichi di responsabilità nell'ambito Commissione Scientifica Nazionale I dell'INFN e in gruppi di lavoro dell'INFN
- valutatore di progetti per conto di INFN, ANVUR, CERN e Department of Energy (DoE) del governo USA.

Sommario dell'attività di terza missione :

- organizzatore di eventi quali masterclass e notte dei ricercatori per l'INFN e l'Università di Ferrara,
- relatore in seminari di divulgazione scientifica presso scuole e associazioni
- organizzatore di un corso per docenti di scuola media secondaria
- autore di articoli di divulgazione scientifica per la rivista *Asimmetrie*' dell'INFN e per il *CERN Courier*

CURRICULUM VITAE

INFORMAZIONI PERSONALI

Nome	**BARBARA RICCI**
Telefono Ufficio	+39 0532 974219
E-mail	ricci@fe.infn.it
Home page	http://www.fe.infn.it/~ricci/
Data di nascita	17 Agosto 1967

ISTRUZIONE E FORMAZIONE

Luglio 2013 — **Abilitazione alla II fascia**, nella tornata 2012 della Abilitazione Scientifica Nazionale, per il settore concorsuale 02/A2 Fisica Teorica delle Interazioni Fondamentali**,**

Gennaio 1998 – Attuale — **Ricercatore Universitario a tempo indeterminato**
Università degli Studi di Ferrara
Dipartimento di Fisica e Scienze della Terra

Ottobre 1996 – Dicembre 1997 — **Borsa di Studio Post-doc per Fisici Teorici**
Istituto Nazionale di Fisica Nucleare – Sezione di Ferrara

Giugno 1996 – Settembre 1996 — **Borsa di Studio per Astronomia e Astrofisica**
Consiglio Nazionale delle Ricerche.

Ottobre 1992 – Dicembre 1995 — **Dottorato in Fisica**
Università degli Studi di Padova
Titolo della Tesi: Nucleosintesi e produzione di neutrini nel Sole
Giudizio: Ottimo

Ottobre 1987 - Luglio 1992 — **Laure in Fisica (VO)**
Università degli Studi di Ferrara
Titolo della tesi: Neutrini solari e interazioni flavour chancing
Voto: 110/110 cum laude

Luglio 1987 — **Maturità classica**
Liceo Classico Ludovico Ariosto, Ferrara
Valutazione del titolo: 54/60

PUBBLICAZIONI SU RIVISTA NEGLI ULTIMI 10 ANNI

1)Comprehensive geoneutrino analysis with Borexino Borexino coll.
Phys Rev. D 101, 012009 (2020)
DOI: 10.1103/PhysRevD.101.012009

1) GIGJ: a crustal gravity model of the Guangdong Province for predicting the geoneutrino signal at the JUNO experiment , L. Rossi et al.
Journal of Geophysical Research, Solid EarthJ2019, vol. 124 (4)
DOI: 10.1029/2018JB016681

2) Distillation and stripping plants for JUNO detector, P. Lombardi et al.
Nuclear and Inst. Methods in Physics Research A925(2019)6-17 ,
DOI: 10.1016/j.nima.2019.01.071 ;

3) Charge reconstruction in large-area photomultipliers
M. Grassi et al. , Journal of Instrumentation 13 (2018) P02008
DOI: 10.1088/1748-0221/13/02/P02008

4) Neutrino Physics in JUNO Fenpeng An et al. (JUNO coll.)
J. Phys. G: Nucl. Part. Phys 43 (2016) 030401
DOI: 10.1088/0954-3899/43/3/030401

5) Spectroscopy of geo-neutrinos from 2056 days of Borexino data
M. Agostini et al. (Borexino coll.)
Phys. Rev D 92 , 031101(R) (2015)
DOI: 10.1103/PhysRevD.92.031101

6) Geoneutrino signal at JUNO
V. Strati et al.
Progress in Earth and Planetary Science 2 (2015)5
DOI: 10.1186/s40645-015-0037-6

7) A reference worldwide model for antineutrinos from reactors
M. Baldoncini et al.
Phys Rev D 91 (2015) 065002
DOI: 10.1103/PhysRevD.91.065002

8) Chameleon fields and solar physics
A. Zanzi and B. Ricci
Mod. Phys. Lett. A 30 (2015) 1550053-1 1550053-17
DOI: 10.1142/S0217732315500534

9) Measurement of geo-neutrinos from 1353 days of Borexino
G. Bellini et al. (Borexino coll.)
Physics Letters B 722 (2013), pp. 295-300
DOI: 10.1016/j.physletb.2013.04.030

10) Observation of Geo-Neutrinos
G. Bellini et al. (Borexino coll.)
Phys. Lett. B 687 (2010) 299-304.
DOI:10.1016/j.physletb.2010.03.05

11) Linear Solar Models
F.L. Villante and B. Ricci
ApJ 714 (2010) 944-959
DOI 10.1088/0004-637X/714/1/944

PROCEEDINGS DI CONGRESSI NEGLI ULTIMI 10 ANNI

1) Geoneutrinos and reactor antineutrinos at SNO+
M. Baldoncini et al., Journal of Physics: Conference Series 718 (2016) 06200;

Proc. of XIV International Conference on Topics in Astroparticle and Underground Physics (TAUP 2015), 7-11 Settembre 2015 Torino Italia

2) High significance measurement of the terrestrial neutrino flux with the Borexino detecto
A. Ianni et al., Journal of Physics: Conference Series 718 (2016) 062025;
Proc. of XIV International Conference on Topics in Astroparticle and Underground Physics (TAUP 2015), 7-11 Settembre 2015 Torino Italia

3) Geo-neutrinos and Borexino detector
L. Ludhova et al. (Borexino coll.) , Physics of Particles and Nuclei 46 (2015)174-181,
Proc. of The International Workshop on Prospects of Particle Physics, "Neutrino Physics and Astrophysics", Valday, Russia, 26 Gennaio – 02 Febbraio, 2014
DOI: 10.1134/S1063779615020148

4) Solar neutrino with Borexino: results and perspectives
O. Smirnov et al. (Borexino coll.), Physics of Particles and Nuclei 46 (2015)166-173,
Proc. of The International Workshop on Prospects of Particle Physics, "Neutrino Physics and Astrophysics", Valday, Russia, 26 Gennaio – 02 Febbraio, 2014
DOI: 10.1134S1063779615020185.

5) Antineutrinos from the Earth: Status and Perspectives
B. Ricci., PoS(Neutel 2015)014,] Proceedings of XVI International Workshop on Neutrino Telescopes, March 2-6 March, 2015, Venice, Italy ,ISSN 1824-8039.

6) Reactor antineutrinos signal all over the world
B. Ricci et al, PoS(Neutel2013)077, Proc. of XV International Workshop on Neutrino Telescopes, 11-15 Marzo 2013, Venice, Italy ,ISSN 1824-8039,

7) Radiogenic contribution to Earth's heat flow through geo-neutrinos
G. Fiorentini et al., Proc.of XIV International Workshop on 'Neutrino Telescopes', 15-18 Marzo 2011, Venice, Italy , edited by M. Mezzetto, Istituto Veneto di Scienze Lettere ed Arti, edizioni papergraf, 2011, ISBN 978-88-97645-01-6,pp 57-65 .

PRESENTAZIONE A CONGRESSI INTERNAZIONALI NEGLI ULTIMI 10 ANNI

Marzo 2015
Seminario su invito "Neutrinos from the Earth: status and perspectives"
Neutrino Telescopes 2-6 Marzo , 2015 Venezia, Italia

Marzo 2013
Poster " Reactor antineutrinos signal all over the world",
Neutrino Telescopes 2-6 Marzo , 2015 Venezia, Italia

Giugno 2012
Poster: "Reactor antineutrinos in the world"
Neutrino 2012, 2-6 Giugno, 2012 Kyoto, Giappon

Ottobre 2010
Seminario su invito: "Reactor antineutrinos in the world"
Neutrino geoscience, 6-8 Ottobre 2010 Laboratori Nazionali del Gran Sasso, Italia

SPERIENZE DIDATTICHE NEGLI ULTIMI 10 ANNI

a.a. 2009-2019
Titolare del corso di Fsiica II per corso di Lurea in Informatica (VO)– Università di Ferrara

a.a. 2012-2013 e a.a. 2011-2012
Titolare del corso di Fisica I per Corso di Laurea Triennale in Informatica – Università di Ferrara

a.a. 2011-2012
Titolare del corso di Elementi di Fisica Subatomica per corso di Lurea Triennale in Tecnologie Fisiche Innovative– Università di Ferrara

a.a. 2010-2011
Titolare del corso di Fsiica per corso di Lurea Triennale in Informatica– Università di Ferrara

a.a. 2009-2019
Titolare del corso di Fsiica II per corso di Lurea in Informatica (VO)– Università di Ferrara

RELATORE DI TESI NEGLI ULTIMI 10 ANNI

a.a. 2012-2013– Corso di Laurea Triennale in Fisica -Università of Ferrara
Titolo della Tesi: Rivelazione di geoneutrini nell'esperimento Borexino
Studente: Carlo Bottardi

a.a.. 2011-2012– Corso di Laurea Triennale in Informatica -Università of Ferrara
Titolo della Tesi: Realizzazione di un site-map per il calcolo di flusso di antineutrini da reattore nel mondo
Studente: Mattia Trombon

a.a. 2010-2011– Corso di Laurea Triennale in Fisica e Astrofisica -Università of Ferrara
Titolo della Tesi: Modelli solari e abbondanze fotosferiche
Studente: Ivan Battaglia

ATTIVITÀ DI DIVULGAZIONE SCIENTIFICA NEGLI ULTIMI 10 ANNI

Maggio 2011- attuale
Organizzazione della iniziativa Porte Aperte al Polo Scientifico Tecnologico di Ferrara: visite guidate all'interno dei laboratori di ricerca aperti al pubblico per una settimana all'anno

Dicembre 2018
Seminario dal titolo "Sole e neutrini" presso scuola primaria di Dogato (Ferrara)

Aprile 2013
Seminario dal titolo " Il sole e la fisica dei neutrini", Corso di Eccellenza per gli studenti delle scuole superiori di Ferrara, Dipartimento di Fisica e Scienze della Terra, Ferrara

Novembre 2005
Seminario dal titolo" L'universo visto con i neutrini", Corso di Aggiornamento per gli insegnanti delle Scuole Superiori di Ferrara, Dipartimento di Fisica e Scienze della Terra, Ferrar

ABILITÀ PERSONALI E COMPETENZE

MADRE LINGUA **Italiano**

ALTRE LINGUE **Inglese : Livello Intermedio**
Tedesco: Livello Base

COMPETENZE INFORMATICHE

Software: Pacchetto Office
Linguaggi di programmazione: Fortran

PATENTE cat. B e cat. A

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali".

Curriculum vitae of Pagliara Giuseppe

Education and titles:

• January 2014: habilitation for Associate Professor (02/A2) from the Italian Ministry of University and Research.

• January 2002 - December 2004: Ph.D. student in Physics (XVII cycle) at the University of Ferrara, Ferrara, Italy. March 2005, Ph.D. diploma in Physics
Thesis: Compact Stars: structure and stability. Tutor: Dr. Alessandro Drago

• October 1996 - July 2001: Student in Physics at the University of Lecce, Italy. Master diploma in Physics (110/110 magna cum laude) at University of Lecce, Italy.
Thesis: ”Luminescenza indotta da microscopio a scansione ad effetto
tunnel su una struttura a quantum dots”. Tutor Prof.ssa Rosaria Rinaldi.

• September 1991 - July 1996, High school ”Liceo Scientifico Statale T. Fiore”, Gallipoli (Lecce), Italy. High school diploma, score 60/60.

Positions, contracts and grants:

• November 2015 – today: Associate professor at the Department of Physics and Earth sciences of the University of Ferrara. Hired through the procedure of “direct call” funded (at 95%) by the Italian Ministry of University and Research.

• September 2011 – October 2015: Researcher at the Department of Physics and Earth Sciences of the University of Ferrara within the program:
“Programma giovani ricercatori Rita Levi Montalcini 2009” funded by the Italian Ministry of University and Research. This program has been instituted, in 2009 for the first time, for hiring outstanding young researchers active in foreign institutions via a ministerial selection based on titles and on a specific research program. In 2009, only 31 projects have been selected among more than 300 applications and I have been one of the six persons funded within the scientific area of physics.

• November 2009 - August 2011: funded project with a fellowship from the ”Individual Grants Program” of the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG) at the Institut fuer Theoretische Physik, Ruprecht-Karls-Universitaet, Heidelberg (Germany).

• November 2008 - October 2009: ExtreMe Matter Institute (EMMI) fellowship for post-doctoral research at the Institut fuer Theoretische Physik, Ruprecht-Karls-Universitaet, Heidelberg (Germany).

• November 2006 - October 2008: funded project from INFN with a fellowship for post-doctoral research at the Institut fuer Theoretische Physik, Goethe Universitaet, Frankfurt am Main (Germany) within the INFN Fellowship program. I have been one of the 5 young italian theoretical physicists to receive this funds in 2006.

• January - October 2006: research contract with the “Math4tech” department of the University of Ferrara (Italy).

• January - December 2005, research contract with the Physics department of Politecnico di Torino (Italy).

• July 2002 - October 2008/ September 2011 - today , Affiliated to INFN (Italian Institute for Nuclear Physics).

• January 2002 - December 2004, Grant for Ph.D. studentship from University of Ferrara (Italy).

• October - December 2001, grant program at the National Laboratory of Nanotechnology (NNL) of Lecce (Italy).

Teaching:

• Course of “Metodi matematici della Fisica” (Mathematical methods of Physiscs), 2017-today at the Department of Physics and Earth Sciences of the University of Ferrara.

• Course of Statistical Physics, 2020 at the Department of Physics and Earth Sciences of the University of Ferrara.

• Course of Scattering Theory, 2019 at the Department of Physics and Earth Sciences of the University of Ferrara.

• Course of Subatomic physics, 2012-2013, 2013-2014 and 2014-2015 at the Department of Physics and Earth Sciences of the University of Ferrara.

• Course of General physics, 2011-2012 and 2012-2013 at the Department of Mathematics of the University of Ferrara.

• Supervisor and co-supervisor for Doctoral and Master students at the University of Ferrara.

• Tutor for the course of General relativity at the Institut fuer Theoretische Physik of Heidelberg.

• Tutor for the student seminars of Quantum Mechanics and Statistical Mechanics at the Institut fuer Theoretische Physik of Heidelberg.

• Co-supervisor of Doctoral and Master students in astrophysics and nuclear physics related areas at the Institut fuer Theoretische Physik of Frankfurt am Main and of Heidelberg.

Research interests in brief:

The main research topic concerns the properties of strongly interacting matter under extreme conditions with several research lines in the fields of nuclear astrophysics and hadronic physics:

• Equation of state of hadronic and quark matter.
• Structure and evolution of compact stars and protoneutron stars.
• Oscillation modes of compact stars and gravitational waves.
• Explosive phenomena in astrophysics: supernovae and gamma-ray bursts.
• Hydrodynamical modeling of heavy ions collisions.
• Low mass scalar mesons and their spectral functions.
• Non-exponential decays of unstable systems and the quantum Zeno effect.

Scientific production and services:

• 57 papers published in international journals (including one publication in “Nature” and three publications in “Physical Review Letters”).
• h-index: 25 from INSPIRE, 23 from ISI web of Knowledge.
• Media coverage: two interviews published in the science magazine ”New Scientist” (February 2006 and December 2013).
• More than 30 among seminars and conference contributions (roughly 1/3 as invited speaker or lecturer)
•Referee for the journals: Physical Review D, Physical Review C, Astrophysical Journal, Nuclear Physics A, Astronomy and Astrophysics, Journal of Physics G, European Physical Journal A - Plus, Physica Scripta, Annals of Physics, Modern Physics Letters B.
Projects reviewer for the NSF (National Science Foundation, USA) and for the FWF (Fonds zur Forderung der wissenschaftlichen Forschung, Austria).