# Benedetto Di Ruzza, Ph.D.

Curriculum Vitae

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Inspire-HEP Author: 1040590
Scopus Author ID: 35227195900

## Education and qualifications

- **Ph.D.** in Physics (XXI Ciclo Dottorato):
  *"Measurement of the branching ratio of the charmless decay Bs to phi,phi at CDFII"*
  http://inspirehep.net/record/1590216
  **Physics Department, University of Trieste, Trieste (Italy). March 19th 2009**
  Tutors: Prof. Livio Lanceri, Dott.ssa Anna Maria Zanetti (University of Trieste and INFN Trieste).

- **Physics Masters Degree** (Laurea quadriennale vecchio ordinamento in Fisica):
  *"Aggiornamento delle funzioni di monitoring online del nuovo Silicon Vertex Tracker Trigger dell' esperimento CDF al Tevatron"*.
  http://www.infn.it/thesis/thesis_dettaglio.php?tid=2676
  **Physics Department, Università degli Studi 'La Sapienza' di Roma (Italy). September 29th 2005.**
  Tutors: Prof.ssa Lucia Zanello, Dott. Marco Rescigno (University of Roma "La Sapienza" and INFN Roma1).

- **Abilitazione Scientifica Nazionale (ASN)**
  **02/A1** - *Fisica Sperimentale Delle Interazioni Fondamentali,* ***Seconda Fascia***
  From July 25 2017 to July 25 2027

- **The 2006 European School of High-Energy Physics** (formerly the **CERN School of Physics**).
  Aronsborg, near Stockholm, Sweden, June 18– July 1, 2006

## Employment

- October 31st 2022 - Present: **University of Foggia** (Foggia, Italy)
  Tenure Track Assistant Professor in Experimental Physics
  **DAFNE** - Department of Agriculture, Food, Natural resources and Engineering
- March 2022 - October 30th 2022: **University of Cassino and Southern Lazio** (Cassino, Italy)
  Contract Professor (Mechanical Engineering Department)
- April 2019 – May 2021: **TIFPA-INFN Center** (Trento, Italy)
  Winner of Post-Doc Research Fellow (Assegno di Ricerca Scientifica)
- February 2016 – July 2017: **Department of Physics and Astronomy, Padova University,** (Padova, Italy).
  Winner of Post-Doc Research Fellow (Assegno di Ricerca Scientifica)

- May 2012 – May 2015: **Brookhaven National Laboratory** (Upton NY, USA)
  Associate Research Scientist (Physics Department)
- July 2010 - May 2012: **Fermi National Accelerator Laboratory** (Batavia IL, USA)
  Associate Research Scientist (Particle Physics Division)
- June 2009 - June 2010: **Fermi National Accelerator Laboratory** (Batavia IL, USA)
  International Guest Scientist
- April 2009 - March 2010: **University of Cassino and Southern Lazio** (Cassino, Italy)
  Winner of Post-Doc Research Fellow (Assegno di Ricerca Scientifica)
- February 2006 - March 2009: **Department of Physics University of Trieste** (Trieste, Italy)
  Winner of Ph.D. Student fellowship

## Research activities

The fundamental motivation of my research activities is a deep passion for **experimental research in particle physics**. Pushed by this passion I had the privilege to work for long time in experiments located at the most relevant hadron colliders: **Tevatron** at FNAL, **RHIC** at BNL and **LHC** at CERN.
The participation to the **CDF, STAR** and **ALICE** experiments gave me the opportunity to contribute to data analyses at the edge of the particle physics research (**heavy flavor** and **gauge bosons** measurements) as well as to the construction, commissioning and running of sophisticated **silicon trackers** and data acquisition systems.

After this experience, my expertise in silicon detectors and in more general experimental apparatus has been of pivotal importance for the research activities in **medical physics** I undertook from 2018 at the **Trento TIFPA-INFN Center**, where I made research not only in application to hadron therapy of silicon trackers (**FOOT** experiment), but also in **radiation hardness characterization of silicon devices** for **space** and **medical** applications.

Since October 2022, as Tenure Track Assistant Professor in Experimental Physics at the **University of Foggia** and as **Bari INFN Section** associate, I'm still doing data analysis in the CDF experiment, data analysis, data taking and hardware commissioning in the FOOT and ALICE experiments and I'm involved in the design of the future **ePIC** experiment to be located in the planned Electron Ion Collider (**EIC**) in BNL.

In January 2023 I started new research activities in **Big Data Analysis** using **AI algorithms** for **medical data evaluation**, **social analysis** and **predictions** using **automatic pattern recognition algorithms, images recognition** and **image classification** methods.

## Chronological list of my past research activities

2004-2009
**Tevatron Collider, CDF II Detector:** Master thesis and PhD thesis

- I started my research activities with the CDFII detector working for my **master thesis**, (available here: http://www.infn.it/thesis/thesis_dettaglio.php?tid=2676) when I extended the functionality of the SPYMON software to the new boards added to the CDF SVT hardware trigger in the 2005 CDFII upgrade. The SPYMON package was a software written in C language and implemented in VxWorks real time Operative System used for the online efficiency monitor of the CDF SVT trigger. I keep the responsibility of the maintenance of this package until the Tevatron shut-down in 2011.
- **PhD thesis data analysis**: Measurement of the Bs to phi, phi decay.
  In this data analysis I started from the cuts optimization for the event selection, I generated the Monte Carlo samples, then I performed the channels efficiency optimization and the final BR measurement. The results of these analysis where published as FERMILAB-THESIS-2008-111 available here: https://inspirehep.net/literature/1590216

2009-2012
**Fermi National Acceleretator Laboratory (FNAL or Fermilab),** Chicago IL (USA).
Particle Physics Division (PPD):
International Fellow (2009-2010) and Research Associate (2010-2012).

**Data Analysis: CDF II Detector**

- B meson analysis
  After my Ph.D. thesis work, I worked also in the Bs to phi,phi polarization decay measurement that was performed using the same data sample I selected for the BR measurement. The results of this activities are described in a PRL (publication **#14)** where are reported my Ph.D. thesis results, and the polarization measurement results.
- Higgs boson analysis
  Since 2011, working in the CDF Higgs data analysis group, I was involved in the "CDFII Higgs Boson Race". The final results of this analysis described in the publication **#13**.

**Fermilab Hardware activities**

- CDFII Silicon Operation Group

Since 2009 I had the responsibility of the maintenance of the CDF silicon detector power supply system monitor and maintenance (channels stability monitoring, modules test and replacement).
In 2010 I increased my involvement in CDF Operations Group becoming Sub Project Leader **(SPL)** of the Silicon Operation Group for the CDFII detector. As SPL I had the responsibility of silicon sensor efficiency monitoring, silicon aging studies, organization of access in the Detector area for elements replacement, coordination of the CDF silicon group, training of the new shifter on the CDF silicon detector data taking procedure. These activities are described in the publication **#12**.

- Silicon Detector Facility (SiDet) and Fermilab Test Beam Facility (FTBF).

After the Tevatron shut-down in September 2011 I worked at the I-V and C-V characterization of silicon strip detectors for the CMS Silicon Detector Upgrade (HPK Campaign) in the Fermilab Silicon Detector Facility (SIDEeT Facility, a class 10,000 clean room).
I also worked at silicon pixel test beam for the CMS upgrade in the T-992 R&D collaboration at the Fermilab Test Beam Facility (https://ftbf.fnal.gov/) where I gave my contribution as pixel beam telescope operator and analyzing data results.

2012-2015

**Brookhaven National laboratory (BNL),** Upton NY (USA).

Physics Department: Research Associate

After the Tevatron shut-down I decided to keep on working in another USA Laboratory hosting a hadron collider, and I moved to the Brookhaven National Laboratory that was hiring people for the Electron Ion Collider (EIC) Project. My position was supported by BNL LDRD Project #11-036.

**Data Analysis: STAR Detector**

In this position I was also member of the STAR collaboration and I not only made data taking shift, and detector maintenance during the shut-down but I was also involved in the data analysis as described in the publication **#10**.

**Silicon Detector Development for a experiment in a EIC**

- Geometry detector design using the EICRooT package

As member of the BNL EIC Task Force i was in charge of the design and simulation of a tracking system based on a silicon detector in a electron/proton, electron/ion collider (eRHIC) using CMOS Monolithic Active Pixels Sensor (MAPS) using the software EICRoot, a BNL flavour of the FairRoot framework. https://wiki.bnl.gov/eic/index.php/BNL_Task_Force_Membership).

- **MAPS sensors qualification with laser and ion beams**

This project required also the construction of a dark-box set-up for characterization and test of a MAPS pixel silicon sensor prototype Mimosa26 with laser beam. I used the same chip also for a characterization with ions beams in the NASA irradiation facility at BNL (NSLR).
In that time the Mimosa26/28 sensor was considered the best candidate pixel sensor for a silicon detector in a EIC collider but after short time the ALPIDE performances, still under design at CERN, grow rapidly and the ALPIDE replaced the Mimosa.
The outcome of these two activities are reported in the publication **#11** and in other conference presentations.

2016-2017

**University of Padova (Italy), Department of Physics and Astronomy:** Post-Doc

During the last year of the EIC work I was intrigued by the ALICE ITS Upgrade project, in particular by the ALPIDE pixel sensor capabilities, that's why I decided to move back to Italy working in the Padova Alice Group that was involved in this project.

**Data Analysis: ALICE Detector**

In the Padova post-doc position I became member of the ALICE collaboration and I worked in the analysis measurement described in the publication **#7**. I made also data taking shift at CERN as Detector Expert and Data Taking Shift Leader during the LHC Run 2.

**Hardware**

- Alice ITS upgrade

I spent the first 6 months of my Padova Physics department post-doc working in the Bari INFN clean room. There I worked at first in the electrical characterization of the ALPIDE prototipes (pALPIDE3), and then gluing and testing first Outern Barrel Modules of the ALICE ITS Upgrade. I also tested these modules using the innovative Mosaic board read-out system developed in Bari.
These activities are reported in the publication **#9** and in one conference presentations.

- iMPACT Project (Horizon 2020 grant agreement 64903)

After the experience on the ALPIDE chip developed in Bari, I realized in Padova tracker set-up using a single ALPIDE chip and a Mosaic Board read-out system. This set-up was used as tracking system in the test-bean described in the publication **#8**. This project was extremely challenging and switched on

in me the interest for medical and space applications of silicon detectors.

- LNL INFN Laboratories: SIRAD irradiation beam-line activity

Working in the Alice Padova Group I had the possibility to increase my experience in ion-beams irradiation working as user support in the SIRAD irradiation beam-line at the LNL INFN Laboratories.

2018-2021

**TIFPA-INFN Trento Center**

The experience of the iMPACT test-beam in the Trento Proton Irradiation facility pushed me to concentrate my research activities on the medical and space applications of silicon detectors, and I accepted a post-doc position in the TIFPA-INFN Trento Center on this topic.

**Data Analysis:**

- **CDFII**

Due to my experience and knowledge of the CDF Silicon Detector, I'm still involved in all the CDF Collaboration publications procedures. The last result is a publication on a high-precision measurement of the W boson mass performed using the full dataset collected by the CDF II Detector in the RunII data taking. This result was published in publication **#3.**

- **FOOT experiment**

Since 2018 I started my data analysis activity also in the FOOT collaboration: I started analyzing test-beam data analysis using python scrips developed by myself. I also worked in writing and in the revision of publications **#4** and **#5**. I also presented, on behalf of the collaboration, the FOOT experiment in a talk at the TIPP2021 Conference (proceeding paper accepted but not published yet).

**Hardware**

- **FOOT experiment:** test beam of the MSD subdetector

I was in charge of the design of the irradiation and performed the preliminary data analysis for channels performance evaluation.

- Proton irradiation of silicon sensors for space experiments.

Supporting the users on this activities at the Trento proton beam-line, I became expert in radiation dose calculation with the SPENVIS tool. I also developed a specific set-up for SEU error rate measurement for electronic devices. These activities are described in publication **#6** and in other conference talks.

- **Proton and x-ray characterization of SiPM**

My last research activity, performed at the TIFPA-INFN center is the silicon hardness characterization of silicon sensors with proton and x-ray. My simulations made possible to use the TIFPA x-ray irradiator, developed for biological irradiation, also for silicon detector TID studies. After that, together with a FBK team, we performed a SiPM radiation hardness characterization campaign. The results were published in two NIM-A papers (publications **#2** and **#1**).

- **4D_Phantom project** and proton **facility electromagnetic background characterization.**

As showed in conference presentations I worked also in the irradiation facility electromagnetic background characterization and developing an innovative hardware tool for onchological treatment plan optimization.

## Publications

For my research activities I'm author or co-author of more than 500 articles in peer-review journals plus other e-prints. The full list of publications is available here:
Inspire-HEP Author: 1040590 (https://inspirehep.net/authors/1040590)

March 2023 Scopus *h*-index: **79**
(https://www.scopus.com/authid/detail.uri?authorId=35227195900)

## List of relevant publications

1) F. Acerbi, A.R. Altamura, B. Di Ruzza, S. Merzi, P. Spinnato, A. Gola
*Characterization of radiation damages on Silicon photomultipliers by X-rays up to 100 kGy*
NIM **A 1045 (2023) 167502**
**DOI:** 10.1016/j.nima.2022.167502

2) A.R. Altamura, F. Acerbi, B. Di Ruzza, E. Verroi, S. Merzi, A. Mazzi, A. Gola
*Radiation damage on SiPMs for space applications*
NIM **A 1045 (2023) 167488**
**DOI:** 10.1016/j.nima.2022.167488

3) T. Aaltonen *et al.* (CDF Collaboration)
*High-precision measurement of the W boson mass with the CDF II detector*
Science **376, 170–176 (2022)**
**DOI:** 10.1126/science.abk178

4) B. Di Ruzza *on behalf of the* FOOT Collaboration
*Fragmentation Measurements in Particle Therapy: status and plans of the FOOT experiment*
J. Phys.: Conf. Ser. **2374** 012184 **(2022)**
**DOI:** 10.1088/1742-6596/2374/1/012184

5) G. Battistoni *et al.*, (FOOT Collaboration)
*Measuring the Impact of Nuclear Interaction in Particle Therapy and in Radio Protection in Space: the FOOT Experiment*
Front. Phys. **8 (2021) 568242**
**DOI:** 10.3389/fphy.2020.568242

6) Benedetto Di Ruzza,
*Proton and x-ray irradiation of silicon devices at the TIFPA-INFN facilities in Trento*
PoS Vol. 390, 685. April 15, 2021
**DOI:** 10.22323/1.390.0685

7) S. Acharya *et al.*, (ALICE Collaboration)
*D-Meson Azimuthal Anisotropy in Midcentral Pb-Pb Collisions at* $\sqrt{s_{NN}}$*=5.02 TeV*
Phys. Rev. Lett. 120, 102301, 9 March 2018
**DOI:** 10.1103/PhysRevLett.120.102301

8) N. Pozzobon, F. Baruffaldi, D. Bisello, C. Bonini, B. Di Ruzza, P. Giubilato, S. Mattiazzo, D. Pantano, L. Silvestrin, W. Snoeys, J. Wyss
*Calorimeter prototyping for the iMPACT project pCT scanner*
NIM **A 936 (2019) 1-4**
**DOI:** 10.1016/j.nima.2018.10.155

9) Benedetto Di Ruzza *on behalf of the ALICE collaboration*
*Characterization of the Outer Barrel modules for the upgrade of the ALICE Inner Tracking System*
2017 JINST **12** C09003
**DOI:** 10.1088/1748-0221/12/09/C09003

10) Adamczyk L., *et al.,* (STAR Collaboration)
*Measurement of the Transverse Single-Spin Asymmetry in $p^{\uparrow}+p \rightarrow W^{\pm}/Z^{0}$ at RHIC*
Phys. Rev. Lett. **116**, 132301, 1 April 2016
**DOI:** 10.1103/PhysRevLett.116.132301

11) E. C. Aschenauer, B. Cole, K. T. Crowley, B. Di Ruzza, E. Hughes, D. Malinsky, M. Winter
*Monolithic Active Pixel Silicon Detectors for Future Electron Ion Colliders: Status and Plans*
IEEE (NSS/MIC), 2012, pp. 1370-1372
**DOI:** 10.1109/NSSMIC.2012.6551333

12) T. Aaltonen *et al.*,
*Operational experience, improvements, and performance of the CDF Run II silicon vertex detector*
NIM **A 729 (2013) 153–181**
**DOI:** 10.1016/j.nima.2013.07.015

13) T. Aaltonen *et al.* (CDF Collaboration, D0 Collaboration)
*Higgs boson studies at the Tevatron*
Phys. Rev. D **88**, 052014 (2013)
**DOI:** 10.1103/PhysRevD.88.052014

14) T. Aaltonen *et al.* (CDF Collaboration)
*Measurement of Polarization and Search for CP Violation in $B^{0}_{s}$ -> phi phi Decays*
Phys. Rev. Lett. **107**, 261802, 22 December 2011
**DOI:** 10.1103/PhysRevLett.107.261802

15) A. Abulencia *et al.* (CDF Collaboration)
*Observation of $B^{0}_{s}$–$B^{0}_{s}$ Oscillations*
Phys. Rev. Lett. 97, 242003, 12 December 2006
**DOI:** 10.1103/PhysRevLett.97.242003

16) J. Adelman, A. Annovi, M. Aoki, A. Bardi b, J. Bellinger, M. Bitossi, M. Bogdan, R. Carosi, P. Catastini, A. Cerri, S. Chappa, M. Dell'Orso, B. Di Ruzza, I. Furic, P. Giannetti, P. Giovacchini, T. Liu, T. Maruyama, I. Pedron, M. Piendibene, M. Pitkanen, B. Reisert, M. Rescigno, L. Ristori, H. Sanders, L. Sartori, M. Shochet, B. Simoni, F. Spinella, S. Torre, R. Tripiccione, F. Tang, U.K. Yang, A.M. Zanetti.
*Real time secondary vertexing at CDF*
NIM **A 569 (2006) 111–114**
**DOI:** 10.1016/j.nima.2006.09.022

## Qualification schools and workshops attended

**- RADECS Conference 2021, Qualification Course on:**

- Space Radiation Environment and Total Ionizing Dose
- Single-Event Effects – Basic Mechanisms and Testing of Complex Devices
- Overview of ESA Cubesat Missions and Radiation Testing on Cubesat Electronics
- Laser Testing for Single-Event Effects: Basics and use cases
- Design and Testing of TID and SEE Radiation Hardened CMOS ASICs

Seibersdorf Laboratories, Austria; 13 Settembre 2021 (Virtual Conference)
https://www.seibersdorf-laboratories.at/en/radecs-2021/conference/short-course

**– Advanced School on Quantum Detectors (SQUAD 2019)**
Bruno Kessler Foundation (FBK), Trento, Italy; 18 - 20 September 2019.
https://squad2019.fbk.eu/home

**– Workshop on Mathematics for Computer Vision 2018**
Bruno Kessler Foundation (FBK)**,** Trento, Italia; 15-16 Febbraio 2018.
https://www.fbk.eu/en/event/workshop-mathematics-computer-vision-2018

– **INFN School of Statistics 2017**
Ischia, Italy; 7th to 11th of May 2017
https://agenda.infn.it/event/12288

– **3rd National Course:**
**Detectors and Electronics for High Energy Physics, Astrophysics, Space Applications and Medical Physics**
INFN Italian National Institute of Nuclear Physics, Legnaro Laboratories.
Padova, Italy; April 20-24, 2009.
https://agenda.infn.it/event/1032

– **INFN School for Grid Users** (experiments VIRGO, CDFII and ARGO)
Bologna (CNAF) Italy; October 6-9, 2008.
https://agenda.cnaf.infn.it/conferenceDisplay.py?confId=168

– **The 2006 European School of High-Energy Physics** (formerly the **CERN school of physics**).
Aronsborg, near Stockholm, Sweden, June 18– July 1, 2006
https://physicschool.web.cern.ch/2006/Aronsborg.html

– **ICTP/Democritos Joint Workshop on Tools for Computational Physics**
International Center for Theoretical Physics “Abdus Salam”.
Trieste Italy; March 6-11, 2006.
http://indico.ictp.it/event/a05195

– **XVIII GIORNATE DI STUDIO SUI RIVELATORI** (Ph.D. School on high energy physics detectors),
Torino (Villa Gualino), Italy; February 28-March 3, 2006.
http://www.gsr.unito.it/?Materiali&2006

## Academia

- **University Of Cassino and Southern Lazio** (Cassino, Italy), Department of Mechanical Engineering Academic year 2021-2022. Contract professor of General Physics. Lessons, exercises and exams for freshman students.

- **University of Trento** (Trento, Italy), Department of Physics, Academic year 2018-2019: Lessons, exercises and tutoring on Experimental Physics for freshman students.

- **Politecnico di Bari** (Bari, Italy), Department of Civil Engineering, Academic year 2015-2016. Lessons, exercises and tutoring on General Physics for freshman students.

- **Stony Brook University** (Stony Brook NY, USA): March 2013 and March 2014. Program: "Women in Science & Engineering, Introduction to Science, Engineering, and Mathematics Research": Teacher for the course WSE 187 - Introduction to Research https://www.stonybrook.edu/sb/bulletin/current/archives/_pdfs/spring2013.pdf

- **University of Trieste** (Trieste, Italy).
  - ✓ Department of Physics, Academic year 2006-2007: lessons, exercises and tutoring on General Physics for freshman students.
  - ✓ Department of Civil and Environmental Engineering, Academic year 2007-2008: exercises and exams support on General Physics for freshman students.

## Student thesis tutoring

- University of Trento, Departmet of Information Engineering and Computer Science (DIE) Academic year 2019-2020, Student: Fabiola Caso, tutor for the laurea thesis: *"RILEVAZIONE DEI LIVELLI DI RADIAZIONE ELETTROMAGNETICA DI BACKGROUND PRESSO LE CAMERE DEL CENTRO DI PROTONTERAPIA DI TRENTO"*

## Lessons in topical schools

- Fermilab, February 2012: **EDIT 2012 Symposium** (*Excellence in Detectors and Instrumentation*). ***"Teaching Assistant for the Silicon Track"*** http://conferences.fnal.gov/EDIT2012/participants.html#TA

- LNL INFN Laboratories, April 2011: 4th National Course: "Detectors and Electronics for High Energy Physics, Astrophysics, Space Applications and Medical Physics" for PhD students and researcher; talk: ***"Longevity Studies on the CDFII Silicon Detectors"*** http://agenda.infn.it/contributionDisplay.py?contribId=12&confId=3245

## Education outreach and engagement

- TIFPA-INFN Center (Trento, Italy)
  - March 2022, ACP 2021: African Conference of Fundamental and Applied Physics.
    7-11 March 2022, Virtual Conference;
    talk: *"X-ray technological irradiation for TID studies on silicon sensor and electronic devices in a medical facility"*. https://indico.cern.ch/event/1060503/contributions/4740690
    Proceeding: arXiv:2206.05119 [physics.ins-det].
  - October and November 2019, Focus Live Workshops and Trento Smart City Week festival:
    guide for visitors in the Trento Proton Irradiation Facility and demonstration of simple particle tracking experiments using silicon detectors to the public. Activities described in this ICHEP2020 talk
    (Proceeding: PoS (ICHEP2020) 939; doi.org/10.22323/1.390.0939)
- Brookhaven National Laboratory (Upton NY, USA),
  - Summer Sunday 2013 and 2014 (BNL Open days): guide for visitors in the STAR Detector tour
  - November 2014: Member of the Brookhaven Young Research Symposium (YRS2014) Organization Committee (https://www.bnl.gov/newsroom/news.php?a=24442)
  - November 2012: Young Researcher Symposium 2012
    talk “eRHIC: a New Collider to explore the fempto-scale structure of protons and nuclei”
    http://www.bnl.gov/bnlyrs2012/files/pdf/agenda.pdf
  - December 2012 – March 2014:
    Board Member of the Association of Students and Post-Doc at Brookhaven (ASAP):
    in charge of the organization of post-doc cultural and networking activities.
  - May 2013 and May 2014: Judge for Suffolk County High Schools Science Fair.
- Stony Brook University (Stony Brook NY, USA),
  - September 2012: Post Doctoral Symposium
    talk “eRHIC: A Quantum Super-Microscope to Investigate the 3D-Structure of the Nuclei”
    by Benedetto Di Ruzza & Salvatore Fazio.
- Area Science Park (Area di Ricerca di Trieste, Italy)
  - May 2006: Open Day 2006
    Guide for visitors in the Padriciano Campus Area Science Park INFN Laboratories

### Experiments

- 2018 - Present, **FOOT:** FragmentatiOn Of Target
  https://web.infn.it/foot/en/home
- 2005 - Present, **CDF II**: Collider Detector at Fermilab, Tevatron Collider (FNAL, USA)
  https://cdf.fnal.gov
- 2016 - 2019, 2023 - Present, **ALICE**: A Large Ion Collider Experiment, LHC Collider (CERN, CH)
  https://alice-collaboration.web.cern.ch
- 2012 - 2017, **STAR**: Solenoidal TrAcker at RHIC, RHIC Collider (Brookhaven National Laboratory, USA)
  https://www.bnl.gov/rhic/star.php

## INFN affiliations

- 2023- Present Bari Section: University Researcher Affiliation
- 2018-2021 TIFPA-INFN Center: Employee
- 2016-2017 Padova Section: Post-Doc affiliation
- 2009-2010 Pisa Section: Post-Doc affiliation
- 2006-2009 Trieste Section: PhD Student affiliation
- 2004-2005 Roma1 Section: Master student affiliation

## Editorial activities

- Review Editor for Frontiers in Physics (FPHY**)**, section: High-Energy and Astroparticle Physics. ISSN: 2296-424X, indexed in SCIE and Scopus
  https://www.frontiersin.org/journals/physics
- Reviewer for the *International Journal of High Energy Physics* (IJHEP), Science Publishing Group. ISSN 2376-7448, indexed in CrossRef.
  https://www.sciencepublishinggroup.com/journal/index?journalid=124

## International conferences organization

- ICECET2022 - International Conference on Electrical, Computer and Energy Technologies 2022: Member of the Scientific Committee
  http://www.icecet.com/

## Software packages and programming languages knowledge

- ROOT 5.xx and 6.xx data analysis framework: very good
- Python, C and C++ programming languages: very good
- Geant4 simulation toolkit: good
- Spenvis, TRIM and SpekPy physics software tools: very good
- PSpice electronic simulation tool: good
- HTML web formatting-language: very good

## Talks and Posters presented in Conferences and Workshops

- April 2022, **SiPM Radiation:** Quantifying Light for Nuclear, Space and Medical Instruments under Harsh Radiation Conditions. 25-25 April 2022, CERN,Virtual Conference;

talk: ***"SiPM Irradiation and Characterization with proton and x-ray beams: the TIFPA-INFN facilities in Trento (Italy)"***. https://indico.cern.ch/event/1093102/contributions/4807098

- March 2022, **ACP 2021:** African Conference of Fundamental and Applied Physics. 7-11 March 2022, Virtual Conference;

talk: ***"X-ray technological irradiation for TID studies on silicon sensor and electronic devices in a medical facility"***. https://indico.cern.ch/event/1060503/contributions/4740690
Proceeding: arXiv:2206.05119 [physics.ins-det].

- December 2021, **IEEE-ICECET 2021:** International Conference on Electrical, Computer and Energy Technologies, 9-10 December 2021, Cape Town (South Africa); Virtual Conference;

talk: ***"Experimental assessment of the electromagnetic background noise in the Trento Proton Therapy Center"***
http://www.icecet.com/2021

- February 2021, **LHCP 2021:** 9th Edition of the Large Hadron Collider Physics Conference 16-18 February 2021, Paris (France); Virtual Conference;

poster: ***"Possibility of Total Ionizing Dose Effects measurements for LHC experiments elements in a medical facility: the TIFPA-INFN experience"***
https://indico.cern.ch/event/905399/contributions/4335523

- May 2021, **TIPP 2021:** 5th International Conference on Technology and Instrumentation in Particle Physics 24-28 May 2021, Vancouver (Canada); Virtual Conference

talk: ***"Fragmentation Measurements in Particle Therapy: status and plans of the FOOT experiment"***
https://indico.cern.ch/event/981823/contributions/4293505/

- February 2021, **TREDI 2021:** "16th Workshop on Advanced Silicon Radiation Detectors" 16-18 February 2021, Trento (Italy); Virtual Workshop;

talk: ***"Ionizing and Non-Ionizing Energy Loss irradiation studies with 70-230 MeV protons at the Trento Proton Therapy Center"***
https://indico.cern.ch/event/983068/contributions/4223200

- February 2021, **BTTB9: "**9th edition of the Beam Telescopes and Test Beams Workshop" 8-11 February 2021, Lecce (Italy); Virtual Workshop

talk: *"Physics and Radiobiology Experimental Beam Tests at the Trento Proton Therapy Center"*
https://indico.cern.ch/event/945675/contributions/4160465

- September 2020, **SIF 2020:** Annual National Congress of the Italian Physical Society 14-18 September 2020; Milano (Italy)

talk*"4DPhantom: An innovative device for oncological proton treatment uncertainties minimization"*.
https://agenda.infn.it/event/23656/contributions/120640/

- July 2020, **ICHEP 2020:** 40th International Conference on High Energy Physics Praga (Cechia) July 28 - August 6, 2020;
  - ✓ Parallel session #15: Education and Outreach.
    talk ***"Proton and x-ray irradiation of silicon devices at the TIFPA-INFN facilities in Trento (Italy)"***
    https://indico.cern.ch/event/868940/contributions/3815732/
  - ✓ Parallel session #15: Education and Outreach.
    *talk* ***"Education initiatives in the experimental area of the Trento Proton Therapy Center (Italy)"***
    https://indico.cern.ch/event/868940/contributions/3814048/

- April 2018, **IFAE 2018:** XVII Edizione degli Incontri di Fisica delle Alte Energie 4-6 April 2018, Milano (Italy);

poster" ***Un tracciatore per particelle cariche nello spazio basato sul sensore ALPIDE"***
https://agenda.infn.it/event/14895/contributions/27357/attachments/77307/99657/BenedettoDiRuzza_IFAE2018.pdf

- October 2016, **IPRD 2016:** 14th Topical Seminar on Innovative Particle and Radiation Detectors
  October 3 – 6, Siena, Italy;

talk ***"The pixel module of the new Inner Tracking System of ALICE at LHC"***
*https://www.bo.infn.it/sminiato/iprd16/03_Mercoledi/Mattina/10_DiRuzza.pdf*

- October 2013, **DNP 2013:** 2013 Fall Meeting of the APS Division of Nuclear Physics
  25 October 2013; Newport News, VA (USA);

talk ***"A Micro Vertex System in a electron/ion collider (EIC) Detector based on Monolithic Active Pixel Sensors"***
https://wiki.bnl.gov/eic/upload/BenedettoDiRuzza_DNP13.pdf

- October 2012, **IEEE-NSS 2012:** 2012 NSS Symposium and Medical Imaging Conference
  29 October - 3 November, 2012; Anaheim, California, USA;

NSS poster session" ***Monolithic Active Pixel Silicon Detectors for Future Electron Ion Colliders: Status and Plans"****; HTTP://wiki.bnl.gov/eic/upload/BenedettoDiRuzza_IEEE_NSS_2012.pdf*

- June 2011, **TIPP Conference 2011:** 2nd International Conference on Technology and Instrumentation in Particle Physics; 9-14 June 2011 Chicago, IL (USA);

talk" ***Operational experience and aging studies of the CDF Run II Silicon Vertex Detector"***
*https://indico.cern.ch/event/102998/contributions/16939/*

- July 28th 2009, **DPF 2009:** 2009 Meeting of the Division of particles and Fields of American Physical Society, 24-31 July 2009; Wayne State University, Detroit, MI (USA);

talk" ***Analysis of Bs->phi, phi decay mode"***
*HTTP://indico.cern.ch/event/41044/contributions/1866773/*

- August 2007: **13th Lomonosov Conference** (Moscow State University)
  23-29 Aug 2007, Moscow (RUS);

talk ***"Tevatron results on B spectroscopy, lifetimes and rare decays"***
info: https://lomcon.ru/?page_id=186

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Foggia, 9 March 2023 Benedetto Di Ruzza