

Monica Verducci

Universita' di Pisa and INFN, Department of Physics



UNIVERSITÀ DI PISA

Experience

- **2019-present** **Research Associate RTD-B**, University of Pisa, Pisa, Italy [ATLAS and Future Colliders FCC groups]
- **2016-2019** **Research Associate**, University of Roma Tre, Rome, Italy. [ATLAS and Future Colliders FCC and CepC groups]
- **2015-2016** **Research Associate**, University of Rome "La Sapienza", Italy. [ATLAS and DarkSide Collaborations]
- **2015** **CERN Associate Project Contract** at CERN, Geneva, Switzerland.
- **2014** **Research Associate** Position, University of Rome "La Sapienza", Italy
- **2010-2014** **Acting Assistant Professor** Position, University of Washington, Seattle, USA
- **2009-2010** **Research Associate** Position, University of Wuerzburg, Germany
- **2008-2009** **INFN PostDoc**, University of Rome "La Sapienza", Italy
- **2005-2008** **CERN Fellowship**, CERN, Geneva, Switzerland

Education

- **2005** Ph.D. in Physics, University of Rome Tre, Italy
- **2001** Degree in Physics, University of Rome "La Sapienza", Italy

Responsibilities

- **2019-2021** **Convener of the ATLAS Non-Collisions Background**, Member of the Data preparation group (Data Preparation Group)
- **2017-2019** **Convener of the ATLAS UEH (Unconventional Signatures and Exotic Higgs)** (ATLAS Exotics group).
- **2017-2019** **Convener of the ATLAS LLP Forum** (ATLAS Exotics and SUSY group).
- **2016-2018** **Convener of ATLAS Conditions**, Member of the Data Preparation Group
- **2010-2020** **Coordinator of the ATLAS MUON Database, Member of the MUON Steering Group**

Supervision of Students

- **2009-2011** **2 Master Students, 1 PhD Student** University of Wuerzburg (Germany) - Higgs and muon-jet analysis
- **2010-2014** **2 PhD Students** University of Washington, Seattle (USA) - LLP Searches
- **2011-2015** **2 PhD Students** University of Bratislava - b-jet analysis with muon
- **2010-2020** **Qualification Project:**
 - **2 PhD students** University of Friburg - Conditions Software,
 - **1 PhD student** University of Dubna (Data Base application),
 - **1 PhD student** University of Valencia (optimization of Non-collision background tagging methods)
- **2020** **Summer student** - remotely - University of Yale - Cosmics-muon Monte Carlo

- **2021** **3 Summer students** - remotely - Cosmics-muon Monte Carlo, Parasitic Collisions studies g-2 Tau studies

Qualification Project 1 PhD student University of Calabria (New MC models for Cosmics ray muons)

Contributions to the ATLAS Publication from GLANCE

only publication where I am/was member of the Analysis Team/Contact Editor/Analysis Contact

- **Exotics Analysis on Long-Lived Particles**

I participated to each step of the analyses flow, from the analysis cut-flow definition and optimisation to the systematics evaluation along with the analysis software framework creation in most of the analyses. I have been the contact editor of all analyses in this area (7 TeV, 8 TeV and 13 TeV papers). I have been the co-Convener of the UEH and the co-Convener of the LLP Forum for two years.

- **2019-2021 Analysis Member of the exotics analysis - Displaced LeptonJet:** Search for long-lived neutral particles decaying into lepton jets in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector Full Run2 Data. ANA-EXOT-2019-05
- **2017-2019 Analysis Member and Contact Editor of the exotics analysis - Displaced LeptonJet:** Search for long-lived neutral particles decaying into lepton jets in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector Run2 Data. EXOT-2017-28
- **2017-2018 Contact Editor LHC White Paper on Long-Lived Particles:** Long-Lived Particle Strategy and Perspective for LHC Future
- **2016 Analysis Member and Contact Editor of the exotics analysis - Displaced LeptonJet:** Search for long-lived neutral particles decaying into jets in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector data of 2015 ATLAS-CONF-2016-042, ATL-PHYS-PUB-2016-010
- **2014 Analysis Contact and Contact Editor of the exotics analysis - Displaced Jet in Hidden Valley Models:** Search for pair-produced long-lived neutral particles decaying to jets in the ATLAS hadronic calorimeter in pp collisions at $\sqrt{s} = 8$ TeV. ATLAS-CONF-2014-041

- **Standard Model Analysis**

I coordinated the analysis on the dijet cross-section of b-jets at $\sqrt{s} = 7$ TeV. I have been analysis contact and contact editor of the paper.

I joined the b-tagging group, working on performance studies.

- **2015 Analysis Contact and Contact Editor of the SM bbjets analysis:** Measurement of the dijet cross-section of b-jets in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector. STDM-2013-03
- **2020 Analysis Member $yy \rightarrow \tau\tau$ and tau g-2 interpretation:** tau g-2 measurement with Pb-Pb data at ATLAS. Collaboration with Theory group. ANA-STDM-2019-19

- **Non Collisions Background Studies**

I am coordinating the studies in this group NCB, participating to the Data preparation Management Group. I am leading two studies on full Run2 data.

- **2020 Analysis Contact, Contact Editor of Online Framework for NCB.** Public ATLAS Note - Under Review. PUB-DAPR-2020-02
- **2020 Analysis Contact, Contact Editor of NCB studies with full Run2 data.** - PUB-DAPR-2020-04

- **Higgs Search**

I participated as analysis member to the analyses on: H to ZZ in four leptons, the measurement of the Higgs width and double Higgs boson decay where one Higgs decays into WW and the other in bb di-jets. I have been the analysis contact and contact editor of the H decay in mu mu for HL-LHC upgrade studies public note (included in few upgrade TDRs).

- **2016-2018 Analysis Contact, Contact Editor - $H \rightarrow \mu\mu$:** H decaying in mu mu for the upgrade studies for HL-LHC (Pub Note). ATL-PHYS-PUB-2018-006
- **2016-2018 Analysis Member, Contact Editor of resolved analysis supporting note - HBSM HH to $bbWW$ 2015+2016:** Search for Higgs boson pair production in the bbWW decay mode at $\sqrt{s}=13\text{TeV}$ with the ATLAS detector. HIGG-2016-27
- **2013-2014 Analysis Member, Contact Editor of resolved supporting note - Higgs Width off shell ZZ, WW:** Constraints on the total width of the Higgs boson through the measurement of off mass shell ZZ and WW production. ATL-PHYS-PUB-2016-006, HIGG-2014-10
- **2013 Analysis Member** Measurement of Higgs Fiducial and Differential cross section in the ZZ decay channel with the ATLAS detector at the LHC. ATLAS-CONF-2014-042, ATLAS-CONF-2014-044, HIGG-2013-22, HIGG-2013-21, HIGG-2013-12

- **Performance Studies**

I was a member of b-tagging working group before Run-1 and currently in the Tile system performances for Run-2. I participated to the upgrade studies for HL-LHC TDRs (for Muon Spectrometer, for the Inner Tracker).

- **2020 Analysis member -Operation and Performance of the ATLAS Tile Calorimeter in LHC Run-2:** overview of the calorimeter's performance in Run2.
- **2019-2020 Analysis member -FTK Performance:** FTK Performance and Testing in Run2 and LS2. TDAQ-2019-02
- **2019-2020 Analysis member-RPC detector and trigger performance:** Performance of the ATLAS RPC detector and L1 Muon Barrel trigger MDET-2019-01
- **2016-2018 Analysis Contact, Contact Editor - $H \rightarrow \mu\mu$:** H decaying in mu mu for the upgrade studies for HL-LHC.
- **2018 Contact Editor** of the Performance and Physics chapter of the *Muon Upgrade TDR*.
- **2010 Analysis Member b-tagging Calibration with System8:** b-tagging Efficiency Calibration in 35pb^{-1} of Data with the ATLAS Detector using the System8 Method. ATLAS-CONF-2011-143
- **since 2005 author** of several proceedings on Conditions Database, Muon Software (alignment, simulation, reconstruction - MOORE and MUID).

Research Activity as member of DarkSide Collaboration (2015-2016), Future Collider RD-FA Collaboration (since 2016).

Papers in Hep/Spires

Papers in hep/spires citable	1032
Citations	135995
h-index	167
Citations/paper (avg)	131.8

Teaching Experiences

2004	Assistant: "Laboratorio di calcolo" C++ course at University of Rome Tre, Physics Department
2008-2009	Assistant : "Laboratorio di calcolo" C course at University of Rome "La Sapienza", Physics Department
2009	Assistant: Lectures on Particle and Nuclear Physics for undergraduate students: Experimentellen Physik IV. University of Wuerzburg (Germany), Physics Department.
2010	Lectures on Advanced Particle Physics. University of Wuerzburg (Germany, Winter Semester 2009 in English)
2014-2015	Lectures on "Mathematics" in the University of "La Sapienza" , Department of Geology, in Rome (Italy). OFA Courses.
2015-2016	Directed (Professor in charge) of course: "Fisica" in the University of "La Sapienza" , Department of Geology, in Rome (Italy).
2015-2016	Assistant of the course: "Nuclear and SubNuclear Physics" in the University of "La Sapienza" , Department of Physics
2016-2017	Assistant: "Esperimentazioni di Fisica I", University of Roma Tre, Department of Physics, in Rome (Italy).
2016-2017	Assistant: "Esperimentazioni di Fisica II", University of Roma Tre, Department of Physics, in Rome (Italy).
2017-2018	Assistant: "Esperimentazioni di Fisica I", University of Roma Tre, Department of Physics, in Rome (Italy).
2017-2018	Directed (Professor in charge) on "Physics for the preparation on the entrance test for Biology", University of Roma Tre, Department of Science, in Rome (Italy).
2018-2019	Assistant: "Esperimentazioni di Fisica I", University of Roma Tre, Department of Physics, in Rome (Italy).
2019-2020	Directed (Professor in charge) on "Fisica I e Laboratorio" (9 CFU) in the University of Pisa ,Department of Chemistry, in Pisa (Italy).
2020-2021	Directed (Professor in charge) on "Fisica I e Laboratorio" (9 CFU) in the University of Pisa ,Department of Chemistry, in Pisa (Italy).

Outreach activities

2005	High School Teachers at CERN
2006	Tutorials at CERN: "Hands-on COOL". Software Tutorials.
2016	La notte della Ricerca University of Roma Tre

2017	Master Classes at University of Roma Tre (2017)
2020	ATLAS Outreach for University of Pisa (co-contact)
2020	Bright 2020 November University of Pisa
2021	Master Classes at University of Pisa
2021	Open Days University of Pisa

Funding-Projects

2014	Higgs Boson Properties studies in the ATLAS experiment n.123/12, Cat. A, Tip.II, del 23.10.2012 (Verducci as Principal Investigator)
2012-2015	Elementary Particle physics Using High Energy Collider Award Number:1206111; (Verducci as member)
2020	Heterogeneous computing with FPGAs - University of Pisa - (Verducci as member)

Talks and Seminars

Seminar 2005 Roma Tre University ATLAS Physics Workshop (Rome) 2005	1. "b quark production in association with a Z boson at the LHC: a selection study with three muons in the ATLAS Spectrometer", March 2005, RomaTre 2. "Measurements with Z+b", June 2005, ATLAS Physics Workshop (Rome) (Invited by Standard Model Conveners (Plenary Talk))
Conference IFAE 2005 Catania (Italy) ATLAS & CMS Workshop 2005 , Bari (Italy)	3. "Studio della Produzione Z+b ad LHC", IFAE 2005 April, Incontri di Fisica delle Alte Energie Catania ("Study of Z+b Production at LHC") 4. "ATLAS and CMS Computing Model", October 2005, Bari, Terzo Workshop della Fisica di Atlas e CMS (Invited Talk by A.Dell'Acqua)
Seminar 2005 , Roma Tre University Conference IFAE 2006 Pavia (Italy)	5. "Mdt Conditions Database with COOL", December 2005, Roma Tre Università (Invited by ██████████) 6. "Vector Boson Production Associated with Jets at LHC (ATLAS)", IFAE 2006 April Incontri di Fisica delle Alte Energie - Pavia
Workshop LHC 2006 , Frascati (Italy)	7. "Produzione di Z associata ai jets a LHC (ATLAS)", October 2006, Frascati, Workshop sui Monte Carlo, la Fisica e le Simulazioni a LHC, (Invited by ██████████)
Conference IPRD06 2006 Siena (Italy)	8. "Atlas Conditions Database and Calibration Stream", October 2006, Siena, 10th Topical Seminar on Innovative Particle and Radiation Detectors IPRD06
Conference 10th ICATPP 2007 Como (Italy)	9. "Atlas Conditions Database Experience with the LCG COOL Project", 10th ICATPP, Conference on Astroparticle, Particle, Space Physics, Detector and Medical Physics Applications, Como 2007
Seminar 2008 Granada University (Spain)	10. "ATLAS prospects with the very first LHC data", July 2008, Granada, Seminar in Granada University, Spain (invited by ██████████)
Conference IEEE 2008 Dresden (Germany)	11. "The ATLAS Conditions Database Model for the Muon Spectrometer", IEEE 2008, Dresden (Germany) October 2008

- Conference ACAT08**
2008 Erice (Italy)
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2008 Erice (Italy)
- Conference ICCMSE**
2009 Rhodes (Greece)
- Conference 11th ICATPP**
2009 Como (Italy)
- Seminar 2010**
University of Wuerzburg (Germany)
- Conference DISCRETE**
2010 Rome (Italy)
- Conference EW Moriond**
2013 La Thuile (Italy)
- Seminar 2014**
LNF Frascati (Italy)
- Conference SIF 2014**
Pisa, (Italy) 2014
- Conference SIF 2014**
Pisa, (Italy) 2014
- Conference IFAE**
Rome, 2015 (Italy)
- Seminar 2015**
Rome, 2015 (Italy)
- Conference 2015**
S. Petersburg (Russia)
- Workshop 2015**
Cosenza (Italy)
- Workshop 2016**
Napoli (Italy)
- IFAE 2017**
Trieste (Italy)
- Conference 2017**
Elba (Italy)
- Conference 2017**
Venice (Italy)
- ATLAS Workshop 2017, Pavia (Italy)**
12. "MDT data quality assessment at the Calibration centre for the ATLAS experiment at LHC", ACAT08, Erice (Italy) November 2008
13. "The ATLAS Conditions Database Model for the MuonSpectrometer", ACAT08, Erice (Italy) November 2008
14. "The Muon Conditions Data Management: Database Architecture and Software Infrastructure", ICCMSE 2009 Seventh International Conference of Computational Methods in Sciences and Engineering, Rhodes (Greece) September 2009
15. "The Muon Conditions Data Management: Database Architecture and Software Infrastructure", 11th ICATPP, Conference on Astroparticle, Particle, Space Physics, Detector and Medical Physics Applications, Como (Italy) October 2009
16. "Studies on heavy flavour estimation in the muon inclusive cross section at ATLAS", Seminar at Wuerzburg University (Germany), October 2010
17. "Hidden Valley Search at ATLAS", DISCRETE 2010, Symposium on prospects in the physics of discrete symmetries, Rome (Italy), December 2010
18. "Search for EWKino production and long-lived particles at the LHC", Rencontres de Moriond EW Interactions and Unified Theories, March 2-9, 2013 at La Thuile, Italy
19. "Long Lived Particles Searches in SUSY and BSM in the ATLAS experiment", Frascati Spring Institute 2014, HUNTING FOR SUSY AT LHC, 14-14 March 2014, LNF, Italy
20. "Ricerca dei decadimenti in coppie di jets di particelle neutre a lunga vita media nel calorimetro adronico dell'esperimento ATLAS a $\sqrt{s}=8$ TeV.", Pisa, 22-26 September 2014, 100th Congresso Italiano della Fisica (Italian Congress).
21. "Ricerca di leptonjets prodotti dal decadimento di particelle neutre a lunga vita con l'esperimento ATLAS al LHC." Pisa, 22-26 September 2014, 100th Congresso Italiano della Fisica (Italian Congress).
22. "Searches on long-lived particles in the ATLAS experiment", 8-10 April 2015 Università di Roma Tor Vergata, IFAE (Italian Congress)
23. "Search for pair produced long-lived neutral particles decaying in the ATLAS hadronic calorimeter in pp collisions at $\sqrt{s} = 8$ TeV", May 2015, Università di Roma La Sapienza, Rome Italy
24. "Jet Results in ATLAS", LHCP 2015, S. Petersburg Russia, August 31 -5 September 2015
25. "Physics Results for the HI-LHC Upgrade in the ATLAS Experiment", ATLAS workshop on first Results on Run2, Cosenza (Italy), 4-6 November 2015
26. "Double Higgs Boson Production", ATLAS Italia workshop, Napoli (Italy), 23-25 November 2016
27. "BSM Searches at ATLAS and CMS", IFAE, Trieste (Italy), April 2017
28. "Low Mass Dark Sector Searches at ATLAS and at CMS", LDMA2017, Elba La Biodola (Italy), May 2017
29. "Measurement of the $b\bar{b}$ dijet cross section in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector.", EPS-HP July 2017, Venezia, Italy
30. "ATLAS Physics Upgrade", 25-27 October 2017, Pavia, Workshop della Fisica di Atlas

- Conference 2018**
Florence (Italy)
31. *"Challenging searches at the LHC (results and perspectives)"*, JHWS-BSM2018, Beyond Standard Model: Where do we go from here? Johns Hopkins Workshop Series, October 2018, Florence, Italy
- Conference 2020**
Perugia (Italy)
32. *"Review on exotics physics ATLAS"*, COMPOSE-IT 2020, Unitarity for composite models and beyond in the HL-LHC era, Perugia January 2020, Invited by Organizers
- Conference 2020**
Moriond QCD (Italy)
33. *"ATLAS Search Highlights"*, MoriondQCD2020, La Thuile, Italy, March -April 2020 - CANCELLED for COVID
- Conference 2020**
Prague (Czechia)
34. *"Search for Long-lived Particles and Unconventional Signatures with the ATLAS detector"*, ICHEP, July 2020