

NATASCIA VIGNAROLI

Curriculum Vitae

GENERAL INFORMATION

RTD-a, Department of Physics "E. De Giorgi", Salento University, via per Arnesano 73100
Lecce, Italy, Office 435

WEB PROFILES:

<http://inspirehep.net/author/profile/N.Vignaroli.1> [HEP - Inspire]

<https://scholar.google.it/citations?user=sZJEz6EAAAAJ&hl=en> [Google Scholar]

<https://www.linkedin.com/in/natascia-vignaroli-21ab9533/?originalSubdomain=it>
[LinkedIn]

<https://www.researchgate.net/profile/Natascia-Vignaroli-2> [ResearchGate]

RESEARCH CODES:

WOS: ABI-6794-2020

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Spoken Languages: Italian, English

Resume Highlights

I am currently a temporary researcher (RTD-A) in the physics department of the “Università del Salento”.

I have an experience of more than ten years of postdoctoral research activity in different international institutions: Naples University, Pisa University, INFN Padova (Italy), CP3-Origins (Denmark), Michigan State University (USA), Iowa State University (USA).

Since March 2018, I am qualified to the function as associate professor in theoretical physics (02/A2) in Italy (I also pass 3/3 thresholds for full professor ASN qualification).

I trained with honors and an excellent profile at the University of Rome “La Sapienza” in 2008 and with a 2 months internship experience at Fermilab.

I received my Ph.D. in Physics in February 2012 from the University of Rome “La Sapienza”, under the supervision of Prof. Roberto Contino. My doctoral dissertation examined the “Phenomenology of heavy fermion and vector resonances in Composite Higgs Models”.

My **research activity** is focused on the phenomenology of theories beyond the Standard Model (BSM), with emphasis on the search for new physics at colliders (LHC and future colliders), and on the interpretation and prediction of the results coming from the experiments. I am particularly interested in understanding (directly and indirectly) the mechanisms behind the electroweak symmetry breaking (EWSB) and I find especially attracting the theories with a new strongly-interacting sector responsible for the EWSB. To reach my research goals, beyond collider tests, I am also interested in model building, in the study of the flavor structure of BSM theories and in developing new techniques to extract information on the Higgs sector. Recently, I also got interested in particle astrophysics and neutrino phenomenology, in understanding the origin of dark matter and the mechanisms related to the electroweak phase transition and baryogenesis. My research enjoys frequent collaboration with experimental teams.

Research Keywords: High Energy Physics Phenomenology, BSM Physics, Collider Physics, (Composite) Higgs, Dark Matter, Neutrinos, Flavor Physics

My research record includes 30 papers published in international peer-reviewed journals (of which 10 as single-author), 12 papers published in conference proceedings, 1 book from the Ph.D. thesis and 5 reports (including a CERN Yellow Report) of international collaborations.

I am member of the international collaborations: “future circular collider (FCC) collaboration”, “LHC Reinterpretation Forum” and external member (Jun 2021-Jun 2022) in ATLAS Pisa.

From the database Inspire-HEP, the total number of my citable papers is 43 (published only: 29), my total number of citations is 3742 (published only: 3272) and my H-index 19 (published only: 18).

From the database SCOPUS, 33 Documents (9 as single author), total number of citations: 1954, average number of citations/year during the postdoctoral period: 164, average citations per product: 59.2, total number of publications in the first quartile (Q1): 22, H-index: 15, normalized H-index: 1.36, total impact factor: 131.0, average impact factor per product: 3.97

I have given 14 invited seminars at international research institutions and 21 (of which 13 plenary) invited talks at international conferences.

SUMMARY OF RELEVANT MERITS

- From Inspire-HEP:

29 papers published in international peer-reviewed journals, of which 8 as single author.

The following 3 publications received more than 500 citations:

- A. Abada et al. [FCC Collaboration], "FCC Physics Opportunities," Eur. Phys. J. C 79, no. 6, 474 (2019)
- A. Abada et al. [FCC Collaboration], "FCC-ee: The Lepton Collider : Future Circular Collider Conceptual Design Report Volume 2," Eur. Phys. J. ST 228, no. 2, 261 (2019).
- A. Abada et al. [FCC Collaboration], "FCC-hh: The Hadron Collider : Future Circular Collider Conceptual Design Report Volume 3," Eur. Phys.J. ST 228, no. 4, 755 (2019).

The following 2 publications received more than 100 citations:

- A. Abada et al. [FCC Collaboration], "HE-LHC: The High-Energy Large Hadron Collider Volume: Future Circular Collider Conceptual Design Report Volume 4," Eur. Phys. J. ST 228, no. 5, 1109 (2019).
- E. Molinaro, F. Sannino and N. Vignaroli, "Minimal Composite Dynamics versus Axion Origin of the Diphoton excess", Mod. Phys. Lett. A, Vol. 31, No. 26 (2016) 1650155.

The following 5 publications (3 of which are single-author) received more than 50 citations:

- N. Vignaroli, "Early discovery of top partners and test of the Higgs nature" Phys. Rev. D 86, 075017 (2012).
- N. Vignaroli, "Discovering the composite Higgs through the decay of a heavy fermion", JHEP 1207, 158 (2012).
- N. Vignaroli, " $\Delta F=1$ constraints on composite Higgs models with left-right parity" Phys. Rev. D 86, 115011 (2012).
- C. Bini, R. Contino and N. Vignaroli, "Heavy-light decay topologies as a new strategy to discover a heavy gluon", JHEP 1201, 157 (2012).
- LHC Reinterpretation Forum Collaboration, "Reinterpretation of LHC Results for New Physics: Status and Recommendations after Run 2," SciPost Phys. 9, no.2, 022 (2020)

- **Eleven years experience of postdoctoral research activity in different international institutions:** I am currently a RTD-a Researcher at Salento University, with a contract funded by the NextGenerationEU program. I have previously been a post-doc researcher at University of Naples, at Pisa University, where I was selected to work in the advanced ERC project NEO-NAT of Prof. A. Strumia, a post-doc researcher, winner of a fellowship by the Italian Institute of Nuclear Physics (INFN fellowship program for foreign researchers or Italians abroad), in the theory group of Padua (for two years), a post-doc research associate at the Centre for Particle Physics Phenomenology and Cosmology “CP3-Origins” in the University of Southern Denmark (for two years), a post-doc at Michigan State University (for three years) and at Iowa State University (for one year, I was called to start my research activity there four months ahead of receiving my Ph.D.).
- **Italian national qualification to the function as associate professor in theoretical physics** (28 March 2018 – 28 March 2029)
- Participation in international projects, grants and collaborations.
In particular, I am member of the "**future circular collider collaboration (FCC)**". I was part of the collaborations: “**LHC Reinterpretation Forum**” (2020), “Energy Frontier Top Quark working group of the 2013 Community Summer Study (**Snowmass**)” (2013). From June 2021 to June 2022 I was associated with **ATLAS** Pisa as an external member. I participated in the **ERC** NEO-NAT project of Prof. A. Strumia (P.I.) (2019-2021). I am working as a rtd-a researcher under a grant funded by the **NextGenerationEU** program. Other participations in collaborations are indicated below in the extended CV.
- I have given **14 invited seminars at international research institutions and 21 (of which 13 plenary) invited talks at international conferences**.
Most notably, I was invited to give a summary talk on “Composite Resonances” at the “1st FCC Physics Workshop” at CERN in 2017, and I was invited as theoretical speaker at the “ATLAS Beyond the Standard Model Higgs and Exotics Joint Workshop” at the Laboratoire de physique subatomique et de cosmologie de Grenoble (LPSC), in 2016.
- **Guest Editor** for the special issue: “Higgs Avenues to New Physics” of the journal *mdpi Symmetry*.
Review Editor for the journal *Frontiers in Physics*
- **Referee** for the journals: *Journal of High energy Physics*, *Physical Review Letters*, *Physics Letters B*, *Physical Review D*, *Annals of Physics*.
- **Organizer of seminars** at CP3-Origins (2016) and at Michigan State University (2012-2015), **chair** at international conferences (“Pheno 2014”, “Pheno 2015”) and **convener** (“IFAE 2023”)
- **Teaching assistant** for the course of Physics, degree in Biology, of the University of Rome “La Sapienza” (2009/2010) and **tutor** (“**discussion leader**”) for the CERN-JINR school of High Energy Physics, “ESHEP 2018”.
- **External supervisor** of two master's theses (a.a. 2022/2023) at Padua University.
- **Several experimental (ATLAS and CMS) searches based on studies on mine** (which

adopted as a benchmark a model and/or a search strategy suggested in a work of mine and used my Monte Carlo implementation for signal simulations).

- Participation in **outreach** activities (in collaboration with CP3-Origins and INFN).

Extended CV

RESEARCH EXPERIENCE (Academic Appointments)

May 2023 –	RTD-A Researcher at University of Salento, Department of Physics “E. De Giorgi”, Lecce, Italy
Ott 2021 – May 2023	PostDoc Researcher at University of Naples, Department of Physics “E. Pancini”, Naples, Italy
Sept 2019 – Sept 2021	PostDoc Researcher at University of Pisa, Department of Physics “E. Fermi”, Pisa, Italy
Sept 2017 – Sept 2019	PostDoc Researcher at “INFN, theory group of Padova”, Padova, Italy
Sept 2015 – Sept 2017	PostDoc Researcher at “Centre for Cosmology and Particle Physics Phenomenology – CP3-Origins”, University of Southern Denmark, Odense, Denmark
Sept 2012 – Aug 2015	PostDoc Researcher at “Michigan State University, Department of Physics and Astronomy”, East Lansing, MI, USA
Oct 2011 – Aug 2012	PostDoc Researcher at “Iowa State University, Department of Physics and Astronomy”, Ames, IA, USA

PROFESSIONAL ACHIEVEMENTS

28 March 2018 – 28 March 2029

Italian national scientific qualification to function as associate professor in theoretical physics (Abilitazione Scientifica Nazionale per il ruolo di professore di seconda fascia per il settore concorsuale 02/A2 – Fisica teorica delle interazioni fondamentali)

EDUCATION

Nov 2008 – Feb 2012

Ph.D. in Physics University of Rome “La Sapienza”

Thesis: “Phenomenology of heavy fermion and vector resonances in Composite Higgs

Models”

Supervisor: Roberto Contino

Examiners: Giovanni Ridolfi, Antonio D. Polosa, Mauro Dell' Orso

Defense Date: February 14th 2012

Sept 2006 – Oct 2008

Master Degree in Theoretical Physics, University of Rome “La Sapienza”

Summa cum Laude (110/110 e Lode) and Excellent profile

Thesis: “The Higgs boson in the $\mu+\mu^-$ channel at the LHC: expected differences in conformal models with a dilaton-Higgs”

Advisors: Barbara Mele, Silvano Petrarca

Defense date: October 24th 2008

2007 – 2008

Excellence Program* of the Faculty of Mathematical, Physical and Natural Sciences of “La Sapienza” (admitted for academic merit)

**The Excellence Program is a supplemental program for deserving students, providing additional courses and activities*

Aug, Sept 2007

Summer Student Internship at the Fermi National Accelerator Laboratory (**Fermilab**), Batavia, IL, USA

Collaboration with the CDF Rome 1 group.

I worked on “SM predictions for Z+(b)jet processes at NLO using MCFM”

Courses taken: C++ programming; Data-analysis with ROOT

Sept 2003 – Oct 2006

Bachelor Degree in Physics, University of Rome “La Sapienza”

Summa cum Laude (110/110 e Lode)

Thesis: “Exit times in stochastic processes”

Advisors: Angelo Vulpiani, Massimo Falcioni

Defense date: October 2nd 2006

Sept 1998 - Jul 2003

High School Diploma on Scientific Studies, Science High School “Gregorio da Catino”

100/100 with honors

SCHOOLS ATTENDED

- 2015 Odense Winter School on Theoretical Physics, University of Southern Denmark
- 2013 Prospects In Theoretical Physics, “LHC Physics”, Institute for Advanced Studies (IAS), Princeton, NJ, USA

- 2009 Hadron Collider Physics Summer School, CERN, Geneva, Swiss
- 2008 Frascati Spring School "Bruno Touschek" in Nuclear, Subnuclear and Astroparticle Physics, Frascati (Rome), Italy

AWARDS and FELLOWSHIPS

- Mar 2023 winner of the competition for a fixed-term research position (RTD-a) in Theoretical Physics at “Università del Salento”, Lecce, Italy
- Dec 2021 winner of the “Maria Zambrano” fellowship, University of Granada. Declined
- 2021 winner of the selection for a Post-Doctoral position (assegno di ricerca) at the University of Naples “Federico II” (PI: Prof. Giulia Ricciardi)
- 2019 winner of the selection for a Post-Doctoral position at the University of Pisa for working in the project ERC NEO-NAT of Prof. A. Strumia
- 2017 INFN post-doctoral fellowship for research activity in Theoretical Physics at Padua (I won one of the 15 INFN fellowships of the 2017 INFN fellowship program for activity in theoretical physics)
- 2008-2011 Ph.D. Scholarship, University of Rome “La Sapienza” (obtained as a winner of the public competitive examination)
- ADISU (Agency for the Right to University Studies) Fellowship for academic merit for the academic years 2004/05, 2005/06, 2006/07, 2007/08
- 2008 ADISU award for the M.Sc
- 2007 Joint DoE (US Department of Energy)/INFN Fellowship for summer training at Fermilab (obtained after a merit-based selection)
- 2006 ADISU award for the B.Sc

TEACHING EXPERIENCE

- 2009-2010
Teaching assistant (30 hours of frontal teaching) for the course of Physics, degree in Biology, of the University of Rome “La Sapienza” (contract obtained after a merit-based selection)
 I proposed and explained on the blackboard exercises on kinematics, dynamics, thermodynamics and electromagnetism.
- 2018
“Discussion leader” (upon CERN invitation) for the 2018 EUROPEAN SCHOOL OF HIGH-ENERGY PHYSICS, 20 June-3 July, Maratea, Italy, organized by CERN and JINR for graduate students and young post-docs working on high-energy particle physics.
 The program of the European School of High-Energy Physics contains lecture series covering the main areas in theoretical particle physics and some more specialized courses.

My responsibilities were to lead discussion sessions that support the courses, answering questions from the students and explaining points arising from the lectures.

- **Thesis Supervision**

External supervisor (internal supervisor: Prof. F. D'Eramo) for the master's degree thesis at Padua University of Matteo Pio Narcisi. Title: “*Perturbative Unitarity Constraints on Dark Matter Theories with Vector Portals*”, defended on 6th April 2023.

External supervisor (internal supervisor: Prof. F. D'Eramo) for the master's degree thesis at Padua University of Mattia Cavallo. Title: “*Dark Matter Phenomenology with Vector Portals*”, defended on 19th July 2023.

PROFESSIONAL ACTIVITY

- April 2023 **Convener** for the session “Energy frontier” of the conference “IFAE 2023, Incontri di Fisica delle Alte Energie”, Catania, Italy
- Aug 2022 **Invited Review Editor** for the journal *Frontiers in Physics*
- Jul 2021 **Invited Guest Editor** for the special issue: “Higgs Avenues to New Physics” of the journal *mdpi Symmetry*
- **Referee** for the Journals:
Physical Review Letters, Physics Letters B, Physical Review D, Annals of Physics
- 2016 **Organizer of Seminars** at CP3-Origins
- 2012-2015 **Organizer** of HEP and Journal Club **Seminars** at Michigan State University
- 2015 **chair** for the BSM I session at the Phenomenology 2015 Symposium (PHENO), Pittsburgh, PA, USA
- 2014 **chair** for the BSM Higgs II session at PHENO 2014, Pittsburgh

OUTREACH

- Contribution to the outreach program “Quantum Rascals” from CP3-Origins, University of Southern Denmark (<http://www.kvantebanditter.dk/en/about>)
- 27/10/2022 Invited speaker at the (live streaming) event: “Dark Matter Day: the contest” promoted by INFN for the international Dark Matter Day
<https://home.infn.it/it/news-infn/5276-il-dark-matter-day-torna-con-un-contest-sulla-materia-oscura>

COLLABORATION IN INTERNATIONAL PROJECTS

- Member of the collaboration: **Future Circular Collider (FCC).**
Physics at a 100 TeV pp collider: beyond the Standard Model phenomena.
Physics opportunities in the search and study of physics beyond the Standard Model at a 100 TeV pp collider.
<http://inspirehep.net/record/1467223>
CERN Yellow Report (2017) no.3, 441-634
- **Top Quark Working Group Collaboration.**
Work of the Energy Frontier Top Quark working group of the 2013 Community Summer Study (**Snowmass**).
<http://inspirehep.net/record/1263763>
SLAC-econf-C130729.2, FERMILAB-CONF-13-648, SLAC-PUB-15960, arXiv:1311.2028
- **LHC Reinterpretation Forum Collaboration**
aimed at improving the reinterpretation of searches and measurements at the LHC in terms of models for new physics
<https://inspirehep.net/record/1785921>
arXiv:2003.07868, SciPost Physics, Vol. 9, issue 2
- June 2021 – June 2022
Association to ATLAS as an external theory member.
I was involved, within the ATLAS Pisa group, in the theoretical description, and Monte Carlo implementation, of the photon flux in Pb-Pb collisions at the LHC and in the analysis finalized to the measurement of the tau anomalous magnetic moment.
I was author of the ATLAS internal note: ATL-COM-PHYS-2021-1095
and M. Verducci, N. Vignaroli, C. Roda and V. Cavasinni, “A study of the measurement of the tau lepton anomalous magnetic moment in high energy lead-lead collisions at LHC,”
arXiv:2307.15160 [hep-ph]

PARTICIPATION IN GRANTS / PROJECTS

- 2023 - Present Research activity as RTD-A researcher under a contract funded by the NextGenerationEU program
- 2023 - Present Participation in the activity of the INFN Lecce theory group
- 2021 - 2023 Participation in the activity of the Naples theory group and INFN Naples theory group
- 2019 - 2021 Participation in the activity of the Pisa theory group (ERC grant NEO-NAT) and INFN Pisa theory group
- 2017- 2019 Participation in the activity of the INFN Padua theory group
- 2017- 2019 Participation in the network “elusives: neutrinos, dark matter and dark energy physics”, European ITN project (H2020-MSCA-ITN-2015//674896-ELUSIVES)

- 2015-2017 Danish National Research Foundation, project D NRF-90, CP3-Origins, University of Southern Denmark
- 2012-2015 “QCD, Electroweak Symmetry Breaking, and Physics Beyond the Standard Model”, NSF grant PHY-0854889, Michigan State University
- 2012-2015 “Global QCD Analysis and Electroweak Symmetry Breaking in High Energy Collider Phenomenology”, NSF grant PHY-0855561, Michigan State University
- 2011-2012 “Investigations in Experimental and Theoretical High Energy Physics”, DOE grant DE-FG02-01ER41155, Iowa State University
- 2009-2012 association to the INFN Rome 1 group

PARTICIPATION IN WORKSHOPS

- 2022 Jun “Neutrinos, Flavour and Beyond, theoretical MITP program”, Anacapri, Italy
- 2019 Jun “Physics at TeV Colliders”, Les Houches Workshop Series, Les Houches, France
- 2018 Sept-Oct “Beyond Standard Model: Where do we go from here?”, Galileo Galilei Institute, Florence, Italy
- 2018 Jun “The Future of BSM Physics, theoretical MITP program”, Anacapri, Italy
- 2017 Dec “6th Rome Joint Workshop: Weird Theoretical Ideas”, Frascati National Laboratory, Frascati (RM), Italy
- 2017 Jan “1st FCC Physics Workshop”, CERN, Geneva, Swiss
- 2016 Sept “9th International Workshop on Top Quark Physics TOP 2016”, Olomouc, Czech Republic
- 2016 Apr “Composite Dynamics: from Lattice to the LHC Run II”, Mainz Institute for Theoretical Physics (MITP), Mainz, Germany
- 2015 Nov “CoDyCE 5, Composite Dynamics and Dark Matter”, Institut de Physique Nucléaire de Lyon (IPNL), Lyon, France
- 2015 May “Vector-Like Quark (VLQ) Workshop”, Argonne National Laboratory, USA
- 2009 Oct “Searching for New Physics at the LHC”, Galileo Galilei Institute (GGI), Florence, Italy
- 2008 Feb “Workshop on Monte Carlo, Physics and Simulations at LHC”, Frascati National Laboratory (LNF), Frascati, Italy

Contribution to

- LHCSki 2016 - A First Discussion of 13 TeV Results, Obergurgl, Austria
- 2015 Mar “Sakata Memorial KMI Workshop on Origin of Mass and Strong Coupling Gauge

Theories”, Nagoya, Japan

- 2013 Community Summer Study: “Snowmass on the Mississippi”, Minneapolis, MN, USA on the future program of particle physics in the U.S
(I was part of the Top Working Group Collaboration)
- 2012 Dec “KMI-GCOE Workshop on Strong Coupling Gauge Theories in the LHC Perspective”, Nagoya, Japan
- 2012 Nov “Understanding the TeV Scale Through LHC Data, Dark Matter, and Other Experiments”, GGI, Florence, Italy

SELECTED PLENARY INVITED TALKS

1 Sept 2022 “[Light-quark Higgs Yukawa couplings](#)”, LFC22: Strong interactions from QCD to new strong dynamics at LHC and future colliders, ECT*, Trento, Italy

12 Jun 2022 “[An accurate evaluation of \(anti-\)neutrino scattering on nucleons](#)”, Eighth Workshop on Theory, Phenomenology and Experiments in Flavour Physics, FPCapri2022, Anacapri, Italy

15 April 2021 “[Light quark Yukawas in triboson final states](#)”, Higgs and Effective Field Theory, HEFT 2021, University of Science and Technology of China, Hefei, China (online)

20 May 2019 “[Discovery Prospects of Leptoquarks at the High luminosity LHC](#)”, Origin of Mass 2019 Conference, CP3-Origins SDU, Odense, Denmark

9 Apr 2019 “[Leptoquarks in B-meson anomalies: simplified models and HL-LHC reach](#)”, Incontri di Fisica delle Alte Energie, Napoli, Italy

6 Mar 2018 “[tt/tb Resonances](#)”, invited theory speaker at “ATLAS Heavy Quark and Top Workshop”, CERN, Geneva, Swiss

19 Jan 2017 “[Composite Resonances](#)”, “1st FCC Physics Workshop”, CERN, Geneva, Swiss

20 Sept 2016 “[Top Signatures From Composite Higgs Theories](#)”, plenary talk at the Young Scientist Forum in the 9th International Workshop on Top Quark Physics TOP 2016, Olomouc, Czech Republic

1 Jun 2016 “[Diphoton Excess From Minimal Composite Dynamics](#)”, “Origin of Mass 2016” Conference, Odense, Denmark

13 Apr 2016 “[Exotics combinations](#)”, invited theoretical speaker at “ATLAS Beyond the Standard Model Higgs and Exotics Joint Workshop”, Laboratoire de physique subatomique et de cosmologie de Grenoble (LPSC), Grenoble, France

8 Apr 2016 “[Topological Terms in Composite Models and their Phenomenology](#)”, Composite Dynamics: from Lattice to the LHC Run II workshop, MITP, Mainz, Germany

27 May 2015 “[Vector-Like Quark Phenomenology Overview](#)”, “VLQ Workshop”, Argonne National Laboratory, USA

26 Jan 2015 “[New strategies for W-prime searches at the LHC](#)”, ATLAS meeting of the Exotics group, CERN

29 Apr 2013 “[Top-partners in Single-EW Production](#)”, ATLAS meeting: 4th generation and top group, CERN

INVITED SEMINARS

13 Jun 2023, “[WIMP Minimal Dark Matter \(and charged resonances\) at a future muon collider](#)”, Laboratoire Charles Coulomb, Montpellier, France

15 July 2020 “ [\$a_\tau\$ in heavy ion collisions at the LHC: modelling and theoretical aspects](#)”, (online) talk at ATLAS meeting for g-2 tau analyses

12 May 2020 “[Constraints on \$a_\tau\$ from UPC at the LHC](#)”, (online) talk at ATLAS meeting, University of Pisa, Italy

19 Sept 2019 “[Investigating and Revealing New Physics Beyond the SM](#)”, University of Liverpool, Liverpool, Great Britain

14 Sept 2018 “[Searching for Leptoquarks at the High-Luminosity LHC](#)”, Frascati National Laboratories, Frascati, Italy

21 Dec 2017 “[Unveiling BSM strong dynamics at future colliders](#)”, Joint Rome Seminar, University of Rome “La Sapienza”, Rome, Italy

16 Feb 2017 “[Collider Phenomenology of Composite Higgs Models](#)”, Theory seminar, Laboratoire de physique subatomique et de cosmologie de Grenoble (LPSC), Grenoble, France

23 Apr 2016 “[Collider Phenomenology of Higgs Compositeness](#)”, Theory seminar, Frascati National Laboratory, Frascati (RM), Italy

23 Apr 2015 “[Distinguishing dijet resonances at the LHC](#)”, Theory Seminar, Fermilab, USA

2014 “[BSM strong dynamics at the LHC](#)” HEP Seminar, Michigan State University, East Lansing, USA

2014 “[W-prime search at the LHC](#)”, HEP Seminar, Michigan State University, East Lansing, USA

2013 “[Discriminating Higgs production mechanisms using jet energy profiles](#)”, HEP Seminar,

Michigan State University, East Lansing, USA

2012 “[Top Partners at the LHC](#)”, HEP Seminar, Michigan State University, East Lansing, USA

2011 “[Phenomenology of heavy fermion and vector resonances in Composite Higgs Models](#)”, HEP Seminar, Iowa State University, Ames, USA

OTHER TALKS

28 Sept 2022 “[An accurate evaluation of \(anti-\)neutrino scattering on nucleons](#)”, invited parallel talk at the International conference on Neutrinos and Dark Matter (NUDM-2022), Sharm-El-Sheikh, Egypt

21 Oct 2021 “[Light quark Yukawas in triboson final states](#)”, meeting of LHCEWWG, CERN (online)

2017 “[Revealing BSM Composite Dynamics Through Topological Interactions at Future Colliders](#)”, parallel talk at the “European Physical Society Conference on High Energy Physics (EPS-HEP)”, Venice, Italy

2015 “[Distinguishing dijet resonances at the LHC using jet energy profile](#)”, parallel talk at PHENO 2015, Pittsburgh, USA

2014 “[New W-prime signals at the LHC](#)” parallel talk at PHENO 2014, Pittsburgh, USA

2012 “[Discovering the composite Higgs through the decay of a heavy fermion](#)”, parallel talk at PHENO 2012, Pittsburgh, USA

2011 “[Discovering Heavy Colored Vectors at the LHC](#)”, plenary talk at IFAE 2011, Incontri di Fisica delle Alte Energie, Perugia, Italy

2010 “ [\$b \rightarrow s\gamma\$ in Composite Higgs Models](#)”, parallel talk at Cortona Theoretical Physics Conference, Cortona (AR), Italy

SUMMARY OF SCIENTIFIC ACHIEVEMENTS

30 papers published in international peer-reviewed journals, of which **10** as single author

12 papers published in conference proceedings

1 book from the Ph.D. Thesis

5 reports (including a CERN Yellow Report and FCC collaborations reports) of international collaborations

(From database: Inspire-HEP)

Total number of citable papers: **43** (Published only: **29**)

Total number of citations: **3742** (Published only: **3272**)

H-index: **19** (Published only: **18**)

(From database: SCOPUS)

33 Documents (**9** as single author), total number of citations: **1954**, average number of citations/year during the postdoctoral period: **164**, average citations per product: **59.2**, total number of publications in the first quartile (Q1): **22**, H-index: **15**, normalized H-index: **1.36**, total impact factor: **131.0**, average impact factor per product: **3.97**

EXPERIMENTAL SEARCHES PARTLY BASED ON STUDIES OF MINE

i.e. which have used as a benchmark a model and/or a search strategy suggested in a work of mine

- ATLAS Collaboration, "Search for single production of vector-like quarks decaying into Wb in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector," *Eur. Phys. J. C* **76** (2016) 8, 442
- ATLAS Collaboration, "Search for pair and single production of new heavy quarks that decay to a Z boson and a third-generation quark in pp collisions at $\sqrt{s}=8$ TeV with the ATLAS detector," *JHEP* **1411**, 104 (2014)
- CMS Collaboration, "Search for electroweak production of a vector-like T quark using fully hadronic final states" *JHEP* **01**, 036 (2020)

considered the research channel suggested in NV, Phys. Rev. D **86** (2012) 075017 and adopted the theoretical description of that study. For the two aforementioned ATLAS searches I also provided my Monte Carlo implementation for signal simulations

- CMS Collaboration, "Search for a W' boson decaying to a vector-like quark and a top or bottom quark in the all-jets final state," *JHEP* **03**, 127 (2019)
- CMS Collaboration, "Search for W' decaying to a vector-like quark and a top or bottom quark in the all-jets final state," CMS-PAS-B2G-20-002 (2021)
- CMS Collaboration, "Search for a W' boson decaying to a vector-like quark and a top or bottom quark in the all-jets final state at $\sqrt{s}= 13$ TeV " e-Print: 2202.12988 [hep-ex] (2022)

considered the research channel suggested in NV, Phys. Rev. D **89** (2014) n.9, 095027 and adopted the theoretical description of that study

- ATLAS Collaboration, "Search for the production of single vector-like and excited quarks in the Wt final state in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector," *JHEP* **1602** (2016) 110

for which I also provided my Monte Carlo implementation of the theoretical model in NV, JHEP 1207 (2012) **158**

- CMS Collaboration, “Search for heavy resonances decaying to top and vector-like quarks in the all- hadronic channel at $\sqrt{s}=13$ TeV”, JHEP **09** (2017) 053

for which I calculated the values of the cross sections of the signal and provided my Monte Carlo implementation of the theoretical model in Bini, Contino, NV, JHEP 1201 (2012) 157

- CMS Collaboration, “Search for the production of an excited bottom quark decaying to tW in proton-proton collisions at $\sqrt{s}=8$ TeV,” JHEP **1601** (2016) 166
- ATLAS Collaboration, “Search for single b^* -quark production with the ATLAS detector at $\sqrt{s}=7$ TeV,” Phys. Lett. B **721** (2013) 171-189
- ATLAS Collaboration, “Search for single production of a vector-like quark via a heavy gluon in the $4b$ final state with the ATLAS detector in pp collisions at $\sqrt{s} = 8$ TeV,” Phys. Lett. B **758**, 249 (2016)
- CMS Collaboration, “Search for single production of vector-like quarks decaying to a Z boson and a top or a bottom quark in proton-proton collisions at 13 TeV ” CMS-PAS-B2G-17-007
- CMS Collaboration, “Search for a heavy resonance decaying to a top quark and a W boson at $\sqrt{s} = 13$ TeV in the fully hadronic final state,” JHEP 12 (2021) **106**

considered the search channels suggested in Bini, Contino, NV, JHEP 1201 (2012) 157

REFERENCES

1. **Roberto Contino**
Full Professor at University of Rome “La Sapienza”
2. **Alessandro Strumia**
Professor at University of Pisa
3. **Francesco Sannino**
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7. **Chien-Peng (C.-P.) Yuan**
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8. **Elizabeth H. Simmons**
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9. **Paride Paradisi**
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