Marco**Bonvini**

researcher in theoretical particle physics

contatti

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Università di Roma
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00185 Roma, Italy

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orcid.org/
0000-0002-5076-1284

lingue

italiano madrelingua
inglese fluente
francese discorsivo
tedesco base

programming

C, C++, fortran, bash
PHP, CSS, HTML
LaTeX, gnuplot
gsl, GiNaC, root
Mathematica

educazione

2009–2012 **Dottorato in Fisica** — Università di Genova, Italy
tesi: *Resummation of soft and hard gluon radiation in perturbative QCD*
advisors: prof. Giovanni Ridolfi, prof. Stefano Forte

2006–2008 **Laura Specialistica** in Fisica — Università di Genova, Italy
110/110 cum laude

2003–2006 **Laurea** in Fisica — Università di Genova, Italy
110/110 cum laude

1998–2003 **Diploma di Liceo Scientifico** — Liceo Scientifico Leonardo da Vinci, Genova, Italy
100/100

esperienza

2019–oggi **INFN, sezione di Roma 1** — Roma, Italy
Ricercatore a tempo indeterminato (terzo livello)

2017–2019 **INFN, sezione di Roma 1** — Roma, Italy
Marie Skłodowska-Curie grant, individual fellowship (due anni)

2016–2017 **Sapienza Università di Roma** — Roma, Italy
Assegno di ricerca (un anno)

2014–2016 **University of Oxford** — Oxford, United Kingdom
Post-Doctoral Research Assistant (due anni)

2012–2014 **Deutsches Elektronen-Synchrotron DESY** — Hamburg, Germany
Post-Doctoral Research Fellow (tre anni)

2011 **CERN European Laboratory for Particle Physics** — Geneva, Switzerland
Unpaid Associate (otto mesi)

2008 **Università di Genova** — Genova, Italy
Contratto co.co.co di ricerca (due mesi)

2007 **CERN European Laboratory for Particle Physics** — Geneva, Switzerland
Summer student, all'esperimento ALICE (due mesi)

didattica

2020, 2021 **Meccanica Analitica e Relativistica** — Sapienza Università di Roma, Rome, Italy
Corso obbligatorio per studenti di Fisica del secondo anno

2018, 2019, 2020 **Advanced topics in QCD** — Università di Roma Tre, Rome, Italy
Corso di Dottorato per dottorandi in Fisica

2017, 2018, 2019 **Esercitatore** — Sapienza Università di Roma, Roma, Italy
Meccanica Classica (per studenti di Fisica del primo anno)

2009, 2010, 2011 **Tutor Didattico** — Università di Genova, Genova, Italy
Meccanica Classica, ElettroMagnetismo, Analisi, Algebra
(per studenti di Fisica del primo anno)

2009–2010 **Esercitatore** — Università di Genova, Genova, Italy
Fisica Generale (Meccanica Classica ed ElettroMagnetismo)
(per studenti di Ingegneria Chimica ed Elettrica del primo anno)

ASN

Abilitazione Scientifica Nazionale
livello:
Seconda Fascia
settore:
02/A2
validità:
dal 24/11/2017
al 24/11/2023

terza missione

2021 **MasterClass 2021** Laboratori Nazionali di Frascati, INFN, Italy
tre lezioni sulla fisica delle particelle elementari a studenti delle superiori

2019 **European Researchers' Night** Università di Roma Tre, Roma, Italy
"Il chioschetto dei tarocchi del fisico"

2018 **European Researchers' Night** Laboratori Nazionali di Frascati, INFN, Italy
animatore scientifico

2010 **Lezione** Università di Genova, Genova, Italy
introduzione ai fenomeni quantistici [slides] a studenti delle superiori

2009, 2010 **Supervisor Scientifico** Università di Genova, Genova, Italy
per gli stage delle scuole superiori al Dipartimento di Fisica (4 settimane)

2007 **Lezione e Dimostrazione in Laboratorio** Università di Genova, Genova, Italy
sulla Fisica della Chitarra [note] durante OpenWeek al Dipartimento di Fisica

2005–2008 **Tutor Orientatore** Università di Genova, Genova, Italy
aiuto per i futuri studenti a decidere la loro carriera accademica (tre anni)

2005 **Animatore Scientifico al Festival della Scienza** Genova, Italy
mostra INFN su Particelle, Forze e Computing (due settimane)

riconoscimenti

2013 **DESY award** Deutsches Elektronen-Synchrotron, Hamburg, Germany
Per "Research in collider phenomenology, in particular precision calculations for Higgs production at the LHC"

2012 **Premio Fubini - menzione speciale** INFN Istituto Nazionale di Fisica Nucleare, Italy
Menzione speciale per la tesi di dottorato "Resummation of soft and hard gluon radiation in perturbative QCD" (ma niente premio)

finanziamenti

2017-2019 **Marie Skłodowska-Curie grant** Horizon2020, Europe
Principal investigator; individual fellowship (IF), progetto HiPPiE@LHC, budget 180k€

2014-2016 **ERC starting grant** Horizon2020, Europe
Partecipante; progetto PDF4BSM, p.i. Juan Rojo

2012-2014 **DESY fellowship** DESY Hamburg, Germany
Fellowship del laboratorio DESY

2010-2011 **PRIN 2008** Italy
Partecipante; titolo "Fisica di precisione del modello standard ai collider", coordinatore Stefano Forte

media

28/12/2017 **After 40 years of studying the strong nuclear force, a revelation**
Articolo apparso su *The Guardian* sulla nostra scoperta della presenza di dinamica BFKL nei dati di HERA, presentata in Eur. Phys. J. C 78 (2018) no.4, 321 [arXiv:1710.05935]

mentoring

Sono attualmente supervisore di uno studente di dottorato, di due studenti di laurea magistrale e di uno studente di laurea triennale
Negli anni passati ho supervisionato tre studenti di laurea magistrale, ho co-supervisionato uno studente di dottorato e ho fatto da mentore a tre studenti di laurea magistrale

coordinamento

Convener della sessione "Frontiera Energia" della conferenza IFAE 2019 (Napoli)

Referee per *Physics Letters B* (PLB) dal 2017
Referee per *European Physical Journal C* (EPJC) dal 2015
Referee per *Journal of Modern Physics A* (JMPA) dal 2016

Referee per la valutazione di un progetto di ricerca per il Department of Energy (DoE) americano nel 2014

Nel periodo 2014-2017 ho coordinato due progetti di ricerca nel contesto dell'ERC Starting Grant PDF4BSM di Juan Rojo riguardanti l'inclusione della risommazione di grande e piccolo x nella determinazione delle PDF.

Sono stato PI del mio progetto di ricerca HiPPiE@LHC (2017-2019)

collaborazioni

Ho collaborato occasionalmente con il gruppo di NNPDF e il gruppo di xFitter

Contributor del LHC Higgs cross section working group (HXSWG)

Contributor del future circular collider (FCC) physics working group

Contributor del Physics of the HL-LHC working group

Insieme a Simone Marzani (Università di Genova), sto coordinando un progetto su small-x resummation, con l'obiettivo di risommare varie osservabili rilevanti per la fenomenologia di LHC and FCC, e di estendere la risommazione a un ordine logaritmico più alto

seminari

18/05/2021 Probabilistic definition of the perturbative theoretical uncertainty from missing higher orders remote
Cambridge HEP seminar series, University of Cambridge, Cambridge, UK

14/12/2020 Probabilistic definition of the perturbative theoretical uncertainty from missing higher orders remote
UZH and UTH seminar, Zürich, Switzerland

10/12/2020 Probabilistic definition of the perturbative theoretical uncertainty from missing higher orders remote
Aachen University, Aachen, Germany

26/11/2020 Probabilistic definition of the perturbative theoretical uncertainty from missing higher orders remote
Dalitz Seminar, University of Oxford, Oxford, UK

28/08/2020 Probabilistic definition of the perturbative theoretical uncertainty from missing higher orders remote
QCD lunch, CERN, Switzerland

06/06/2019 Uncertainties from missing higher orders in perturbative computations
Nikhef, Amsterdam, The Netherlands

11/10/2017 Quantifying theoretical uncertainties
University of Genova, Genoa, Italy

16/06/2016 Understanding theoretical uncertainties: the case of the inclusive Higgs cross section
University of Milano, Milan, Italy

11/11/2015 Precision LHC phenomenology from resummation
INFN LNF, Frascati, Italy

21/10/2015 Higgs production in association with bottom quarks
University of Edinburgh, Edinburgh, UK

21/05/2015 Collinear factorization with heavy quarks
Particle Phenomenology Forum, University of Oxford, Oxford, UK

30/06/2014 Precision phenomenology from resummations: the Higgs cross section
University of Rome La Sapienza, Rome, Italy

06/05/2013 Threshold resummation in SCET vs pQCD: an analytic comparison
University of Münster, Germany

12/11/2012 Precise determination of the Higgs production cross-section at the LHC
DESY, Hamburg, Germany

08/11/2012 Threshold resummation in SCET vs pQCD: an analytic comparison
IPPP, Durham, United Kingdom

talks

conf. internazionali: 30
conf. nazionali: 2
talks informali: vari

Selezione di talks su invito

10/11/2020 Resolving parton dynamics at small x at FCC-eh remote
4th FCC Physics and Experiments Workshop, CERN, Switzerland

29/11/2019 Small-x resummation and its impact in PDF determination
Workshop on Resummation, Evolution, Factorization (REF 2019), Pavia, Italy

10/09/2019 Parton Distribution Functions and LHC phenomenology
Towards accuracy at small x, University of Edinburgh, Edinburgh, UK

24/06/2019 Overview of proton PDFs and small-x resummation
Initial Stages 2019, Columbia University, New York, US

19/12/2018 New insights on the proton's structure
7th Rome Joint Workshop: Current topics in Particle Physics, LNF, Frascati, Italy

30/08/2018 Recent developments in Small-x Resummation
Diffraction and Low-x 2018, Reggio Calabria, Italy

07/06/2018 Recent progress in PDF theory
Sixth Annual Conference on Large Hadron Collider Physics (LHCP 2018), Bologna, Italy

15/01/2018 Small-x issues at FCC
2nd FCC physics workshop, CERN, Switzerland

13/09/2017 Small-x resummation in PDF fits and implications for high-energy colliders
LHeC and FCC-eh workshop, CERN, Switzerland

18/11/2016 Theory uncertainty from missing higher orders
Challenges in Collider Physics, INFN LNF, Frascati, Italy

22/08/2016 Resummation in PDF fits
22/08/2016 Theory precision for the ggH inclusive cross section
QCD@LHC 2016, University of Zürich, Switzerland

13/04/2016 Resummations in PDF fits
24th International Workshop on DIS and Related Subjects, DESY Hamburg, Germany

04/09/2015 Collinear factorization with Intrinsic Charm
02/09/2015 Approximate N^3LO: Higgs and more
QCD@LHC 2015, Queen Mary, University of London, UK

25/06/2015 N^3LO: DIS prospects and Higgs in pp
LHeC workshop 2015, CERN and Chavannes-de-Bogis, Switzerland

18/02/2015 Non-perturbative charm and VFNS
18/02/2015 Large- and small-x resummations in PDF fits
Parton Distributions for the LHC, Benasque, Spain

10/06/2014 Higgs production in gluon fusion beyond NNLO
Parton shower, event generators and resummation (PSR 2014), Münster, Germany

26/03/2014 An EFT approach to initial-state heavy quarks
XIth Annual Workshop on Soft-Collinear Effective Theory (SCET 2014), Munich, Germany

05/09/2013 Higgs production in gluon fusion at approximate N^3LO
QCD@LHC 2013, DESY Hamburg, Germany

codici

THunc
calcolo dell'incertezza da missing higher orders di una espansione perturbativa

HELL
risommazione di piccolo x di DGLAP splitting functions, heavy-quark matching conditions, e coefficient functions per DIS, Higgs, Drell-Yan, ...

ggHiggs
sezione d'urto di Higgs in gluon fusion fino a N^3LO

TROLL
risommazione in soglia al N^3LL' per Higgs, Drell-Yan e DIS

ReDY
distribuzione in massa invariante e rapidità per il processo di Drell-Yan a NNLO+NNLL

bbX
produzione di Higgs con bottom quarks massivi risommando logaritmi collineari

massiveDISsFunction
funzioni di struttura in DIS con quark entrante massivo

ricerca

La mia attività di ricerca, iniziata nel 2007, è stata incentrata principalmente sulla fenomenologia della QCD ai collider adronici (LHC e oltre), e può essere riassunta come segue:

Risommazione in soglia Ho studiato la risommazione in soglia per vari processi, da produzione di coppie leptoniche di Drell-Yan a Higgs e $t\bar{t}$, e risommazione in Deep Inelastic Scattering (DIS). Il mio lavoro era incentrato principalmente su: estendere il formalismo della risommazione alle distribuzioni in rapidità, migliorare la risommazione per allargarne la regione di validità, studiare l'impatto della divergenza della serie perturbativa introducendo una nuova prescrizione per sommarla, determinare la regione di validità della risommazione in modo quantitativo. Inoltre, ho compiuto un confronto dettagliato tra il formalismo tradizionale direct-QCD (dQCD) e il recente formalismo basato su soft-collinear effective theory (SCET). Soprattutto, ho prodotto predizioni allo stato dell'arte per la sezione d'urto di produzione dell'Higgs a LHC alla massima accuratezza attualmente possibile (N^3LO+N^3LL), documentate nell'ultimo yellow report dell'Higgs Cross Section Working Group.

Risommazione di alta energia Ho studiato e sviluppato la risommazione dei logaritmi di piccolo x, importanti ad alte energie, nel contesto del DIS e dei collider adronici. La risommazione di piccolo x riguarda anche l'evoluzione DGLAP delle funzioni di distribuzione partonica (PDF), ed è quindi importante per una precisa descrizione dei dati a piccolo x usati nei fit delle PDF. Ho proposto un nuovo approccio alla risommazione delle coefficient functions, particolarmente adatto per una efficiente implementazione numerica, e sviluppato un codice pubblico che fornisce splitting functions e coefficient functions risommate. L'inclusione della risommazione di piccolo x nei fit di PDF migliora drasticamente la descrizione dei dati di HERA a piccolo x, e predice PDF di gluone e quark-singlet piuttosto diverse dalla loro versione a ordine fisso, con importanti implicazioni per la fisica di precisione a LHC e a collider futuri ad alta energia. In un lavoro recente, ho mostrato che il rate di produzione di Higgs aumenta di molto includendo gli effetti della risommazione a piccolo x. Attualmente sto lavorando per estendere la risommazione ad altri processi (Drell-Yan e heavy-quark production) a livello multi-differenziale.

N^3LO approssimato Ho usato la conoscenza combinata delle risommazioni di soglia e di alte energie per fare predizioni accurate per le sezioni d'urto a N^3LO della produzione di Higgs (scalare e pseudoscalare) in gluon fusion e di coppie di top quarks. Ho usato la risommazione di piccolo x per fare una predizione delle splitting functions a N^3LO.

Fattorizzazione collineare Ho proposto un nuovo approccio per costruire un cosiddetto variable flavor number factorization scheme, basato su un setup di teoria di campo effettiva, particolarmente conveniente per problemi multi-scala. L'approccio ha permesso la costruzione di un conteggio di potenze più adatto al caso in cui i logaritmi collineari da quark massivi vengano risommati. L'ho applicato alla produzione di Higgs in associazione con bottom quarks, dove ha portato a un risultato accurato e perturbativamente stabile, adottato come raccomandazione dall'Higgs Cross Section Working Group. Ho poi lavorato ad un'estensione della fattorizzazione collineare che ammetta una potenziale componente intrinseca della PDF del charm nel protone.

Fit di PDF Ho prodotto il primo fit globale di PDF con risommazione in soglia, nel contesto della tecnica NNPDF per i fit di PDF. Con la collaborazione NNPDF ho anche prodotto il primo fit unbiased della PDF del charm direttamente dai dati. Recentemente, ho prodotto i primi fit di PDF (nel contesto di NNPDF e di xFitter) che includono la risommazione di piccolo x. Ho proposto una nuova parametrizzazione per le PDF in xFitter.

Incertezze teoriche Un mio interesse recente riguarda la stima affidabile delle incertezze di predizioni teoriche. Recentemente ho proposto nuovi metodi, basato su un approccio probabilistico Bayesiano, per stimare l'incertezza da missing higher orders. Questi metodi rappresentano una importante alternativa al metodo canonico di variazione di scala, che oltre ad essere fondati da un punto di vista probabilistico sono anche più accurati e affidabili. Uno dei prossimi obiettivi di questa ricerca è di usare questi metodi per includere le incertezze teoriche nei fit delle PDF.

pubblicazioni

pubblicazioni totali: 45

paper pubblicati: 28
(di cui PRL: 2)
(di cui unico autore: 2)

conference proceedings: 8
working group reports: 8
tesi: 1

source: inSPIRE HEP
citazioni totali: 4500+
a paper pubblicati: 1300+
⟨citazioni/paper⟩: ∼50
h-index: 30

Una lista completa delle mie pubblicazioni si trova nel database **inSPIRE HEP**, dove è anche disponibile il mio **Author Profile**. Il mio h-index attuale è **20**.

Paper pubblicati in riviste peer-reviewed

Probabilistic definition of the perturbative theoretical uncertainty from missing higher orders
M. Bonvini
Eur. Phys. J. C 80 (2020) no.10, 989 arXiv:2006.16293 cit: 12

A new simple PDF parametrization: improved description of the HERA data
M. Bonvini, F. Giuli
Eur. Phys. J. Plus 134 (2019) no.10, 531 arXiv:1902.11125 cit: 10

Small-x phenomenology at the LHC and beyond: HELL 3.0 and the case of the Higgs cross section
M. Bonvini
Eur. Phys. J. C 78 (2018) no.10, 834 arXiv:1805.08785 cit: 17

Four-loop splitting functions at small x
M. Bonvini, S. Marzani
JHEP 1806 (2018) 145 arXiv:1805.06460 cit: 8

Double resummation for Higgs production
M. Bonvini, S. Marzani
Phys. Rev. Lett. 120 (2018) no.20, 202003 arXiv:1802.07758 cit: 24

Impact of low-x resummation on QCD analysis of HERA data
H. Abdolmaleki *et al.* [xFitter Developers' Team]
Eur. Phys. J. C 78 (2018) no.8, 621 arXiv:1802.00064 cit: 53

Parton distributions with small-x resummation: evidence for BFKL dynamics in HERA data
R. D. Ball, V. Bertone, M. Bonvini, S. Marzani, J. Rojo, L. Rottoli
Eur. Phys. J. C 78 (2018) no.4, 321 arXiv:1710.05935 cit: 113

Towards parton distribution functions with small-x resummation: HELL 2.0
M. Bonvini, S. Marzani, C. Muselli
JHEP 1712 (2017) 117 arXiv:1708.07510 cit: 31

Small-x resummation from HELL
M. Bonvini, S. Marzani, T. Peraro
Eur. Phys. J. C 76 (2016) no.11, 597 arXiv:1607.02153 cit: 36

Pseudo-scalar Higgs boson production at $\mathrm{N^3LO_A}+\mathrm{N^3LL'}$
T. Ahmed, M. Bonvini, M. C. Kumar, P. Mathews, N. Rana, V. Ravindran, L. Rottoli
Eur. Phys. J. C 76 (2016) no.12, 663 arXiv:1606.00837 cit: 32

A Determination of the Charm Content of the Proton
R. D. Ball *et al.* [NNPDF Collaboration]
Eur. Phys. J. C 76 (2016) no.11, 647 arXiv:1605.06515 cit: 94

Matched predictions for the $b\bar{b}H$ cross section at the 13 TeV LHC
M. Bonvini, A. S. Papanastasiou, F. J. Tackmann
JHEP 1610 (2016) 053 arXiv:1605.01733 cit: 55

On the Higgs cross section at $\mathrm{N^3LO}+\mathrm{N^3LL}$ and its uncertainty
M. Bonvini, S. Marzani, C. Muselli, L. Rottoli
JHEP 1608 (2016) 105 arXiv:1603.08000 cit: 54

Charm in Deep-Inelastic Scattering
R. D. Ball, M. Bonvini, L. Rottoli
JHEP 1511 (2015) 122 arXiv:1510.02491 cit: 37

Intrinsic charm in a matched general-mass scheme
R. D. Ball, V. Bertone, M. Bonvini, S. Forte, P. Groth Merrild, J. Rojo, L. Rottoli
Phys. Lett. B 754 (2016) 49 arXiv:1510.00009 cit: 50

Resummation and matching of b-quark mass effects in $b\bar{b}H$ production
M. Bonvini, A. S. Papanastasiou, F. J. Tackmann
JHEP 1511 (2015) 196 arXiv:1508.03288 cit: 64

Parton distributions with threshold resummation
M. Bonvini *et al.*
JHEP 1509 (2015) 191 arXiv:1507.01006 cit: 63

Top Quark Pair Production beyond NNLO
C. Muselli, M. Bonvini, S. Forte, S. Marzani, G. Ridolfi
JHEP 1508 (2015) 076 arXiv:1505.02006 cit: 37

Three loop soft function for $\mathrm{N^3LL'}$ gluon fusion Higgs production in soft-collinear effective theory
M. Bonvini, L. Rottoli
Phys. Rev. D 91 (2015) no.5, 051301 arXiv:1412.3791 cit: 31

Resummation prescriptions and ambiguities in SCET vs dQCD: Higgs production as a case study
M. Bonvini, S. Forte, G. Ridolfi, L. Rottoli
JHEP 1501 (2015) 046 arXiv:1409.0864 cit: 44

Resummed Higgs cross section at $\mathrm{N^3LL}$
M. Bonvini, S. Marzani
JHEP 1409 (2014) 007 arXiv:1405.3654 cit: 103

Updated Higgs cross section at approximate $\mathrm{N^3LO}$
M. Bonvini, R. D. Ball, S. Forte, S. Marzani, G. Ridolfi
J. Phys. G 41 (2014) 095002 arXiv:1404.3204 cit: 56

Signal-background interference effects for $gg \to H \to W^+W^-$ beyond leading order
M. Bonvini, F. Caola, S. Forte, K. Melnikov, G. Ridolfi
Phys. Rev. D 88 (2013) no.3, 034032 arXiv:1304.3053 cit: 101

Higgs production in gluon fusion beyond NNLO
R. D. Ball, M. Bonvini, S. Forte, S. Marzani, G. Ridolfi
Nucl. Phys. B 874 (2013) 746 arXiv:1303.3590 cit: 119

The Threshold region for Higgs production in gluon fusion
M. Bonvini, S. Forte, G. Ridolfi
Phys. Rev. Lett. 109 (2012) 102002 arXiv:1204.5473 cit: 30

Threshold Resummation in SCET vs. Perturbative QCD: An Analytic Comparison
M. Bonvini, S. Forte, M. Ghezzi, G. Ridolfi
Nucl. Phys. B 861 (2012) 337 arXiv:1201.6364 cit: 38

Soft gluon resummation of Drell-Yan rapidity distributions: Theory and phenomenology
M. Bonvini, S. Forte, G. Ridolfi
Nucl. Phys. B 847 (2011) 93 arXiv:1009.5691 cit: 55

Borel resummation of transverse momentum distributions
M. Bonvini, S. Forte, G. Ridolfi
Nucl. Phys. B 808 (2009) 347 arXiv:0807.3830 cit: 10

Working group reports

The Large Hadron-Electron Collider at the HL-LHC
P. Agostini *et al.* [LHeC, FCC-he Study Group]
arXiv:2007.14491 cit: 76

HE-LHC: The High-Energy Large Hadron Collider : Future Circular Collider Conceptual Design Report Volume 4
A. Abada *et al.* [FCC]
Eur. Phys. J. ST 228 (2019) no.5, 1109-1382 arXiv: cit: 142

FCC-hh: The Hadron Collider: Future Circular Collider Conceptual Design Report Volume 3
A. Abada *et al.* [FCC]
Eur. Phys. J. ST 228 (2019) no.4, 755-1107 arXiv: cit: 338

FCC-ee: The Lepton Collider: Future Circular Collider Conceptual Design Report Volume 2
A. Abada *et al.* [FCC]
Eur. Phys. J. ST 228 (2019) no.2, 261-623 arXiv: cit: 387

FCC Physics Opportunities: Future Circular Collider Conceptual Design Report Volume 1
A. Abada *et al.* [FCC]
Eur. Phys. J. C 79 (2019) no.6, 474 arXiv: cit: 350

Report from Working Group 2: Higgs Physics at the HL-LHC and HE-LHC
M. Cepeda, S. Gori, P. Ilten, M. Kado, F. Riva *et al.*
CERN Yellow Rep. Monogr. 7 (2019), 221-584 arXiv:1902.00134 cit: 361

Handbook of LHC Higgs Cross Sections: 4. Deciphering the Nature of the Higgs Sector
D. de Florian *et al.* [LHC Higgs Cross Section Working Group]
arXiv:1610.07922 cit: 1429

Physics at a 100 TeV pp Collider: Standard Model Processes
M. L. Mangano *et al.*
CERN Yellow Report (2017) no.3, 1 arXiv:1607.01831 cit: 146

Conference proceedings

Improved description of the HERA data with a new simple PDF parametrization
F. Giuli, M. Bonvini
PoS DIS2019 (2019), 014 arXiv:1906.06573 cit: 0

Recent developments in small-x resummation
M. Bonvini
Acta Phys. Polon. Supp. 12 (2019) no.4, 873 arXiv:1812.01958 cit: 1

Recent progress in PDF theory
M. Bonvini
PoS LHCP 2018 (2018) 205 arXiv:1809.04924 cit: 0

Towards small-x resummed parton distribution functions
L. Rottoli, M. Bonvini
PoS DIS 2017 (2018) 207 arXiv:1707.01535 cit: 3

Resummations in PDF fits
M. Bonvini
PoS DIS 2016 (2016) 030 arXiv:1611.01925 cit: 1

An approximate N^3LO cross section for Higgs production in gluon fusion
M. Bonvini
EPJ Web Conf. 60 (2013) 12008 arXiv:1306.6633 cit: 1

The scale of soft resummation in SCET vs perturbative QCD
M. Bonvini, S. Forte, M. Ghezzi, G. Ridolfi
Nucl. Phys. Proc. Suppl. 241-242 (2013) 121 arXiv:1301.4502 cit: 17

Threshold resummation for Drell-Yan production: Theory and phenomenology
M. Bonvini
PoS DIS 2010 (2010) 100 arXiv:1006.5918 cit: 3

Tesi di dottorato

Resummation of soft and hard gluon radiation in perturbative QCD
M. Bonvini
arXiv:1212.0480 cit: 27

7 ottobre 2021

CURRICULUM VITAE

PERSONAL DATA

Name: Gennaro Corcella

Citizenship: Italian.

Address: INFN – Laboratori Nazionali di Frascati, Via E. Fermi 54 (già 40), I-00044 Frascati (RM).

E-mail address: gennaro.corcella@lnf.infn.it

Languages: Italian (mother tongue), English (excellent), French (very good), Spanish (very good), German (basic).

ACADEMIC CAREER

July 1995: Master ("Laurea") Degree in Physics, University of Bari.
Thesis title: "Simmetria CPT nel Sistema dei Mesoni B" ("CPT Symmetry in the B-Meson System"), in Italian.

November 1995 - October 1999: Graduate student at the University of Milano, Italy.

February 2000: Ph.D. Degree in Physics, University of Milano.
Thesis title: "Parton Showers in High Energy Physics".

November 1999 - October 2001: Postdoctoral Research Associate, University of Rochester, NY, U. S. A.

November 2001 - November 2003: Postdoctoral Research Associate, Max-Planck-Institut für Physik, Werner-Heisenberg-Institut, München, Germany.

December 2003 - November 2005: Postdoctoral Fellow, CERN, Department of Physics, Theory Division, Genève, Switzerland.

December 2005 - September 2007: Postdoctoral Research Associate, University of Rome 'La Sapienza', Italy.

January 2008 - December 2010: Research Associate at Scuola Normale Superiore, Pisa, supported by a Junior Grant of the Enrico Fermi Centre, project 'New Physics Signals and Standard Model Backgrounds at the LHC'.

January 2011 - April 2019: Permanent Staff Member at INFN as 'Ricercatore' (3rd level Researcher, equivalent to a University Assistant Professor), Laboratori Nazionali di Frascati, Italy.

April 2019 - Present: Permanent Staff Member at INFN as 'Primo Ricercatore' (2nd level Researcher, equivalent to a University Associate Professor), Laboratori Nazionali di Frascati, Italy.

2013-2018: Habilitation as a University Associate Professor of Theoretical Particle Physics (expires automatically after 6 years)

Visiting appointments:

September 1998 - June 1999: Visitor at Rutherford Appleton Laboratory, U. K., Particle Physics Department, Theory Group.

July 1999 - October 1999: Visitor at CERN Theory Division, Geneva, Switzerland.

August 2001: Visitor at Fermilab Theory Division, Batavia, IL, U. S. A.

March 2006: Visitor at UNAM, Mexico City, Mexico, supported by a fellowship of the HELEN (High Energy Physics Latinamerican-European Network) project.

August 2007 - September 2007: Visitor at the University of Buenos Aires, Argentina, supported by a fellowship of the HELEN (High Energy Physics Latinamerican-European Network) project.

October 2007 - December 2007: Visitor at CERN, Theory Division, Geneva, Switzerland.

Conference and Workshop talks:

"Tests of CPT in the B Meson System", Italian Conference on Theoretical Physics, Como, Italy, June 1997.

"Gluon Radiation in Top Decays", ECFA/DESY Linear Collider Workshop (top quark working group), Frascati, Italy, November 1998;

"Simulation of Gluon Radiation in Top Production and Decay", Workshop on Standard Model Physics (and more) at the LHC (top quark working group), CERN, Geneva, Switzerland, January 1999.

"Radiative Corrections to Monte Carlo Simulations of Drell–Yan Processes", Workshop on Standard Model Physics (and more) at the LHC (QCD working group), CERN, Geneva, Switzerland, January 1999.

"Matrix Element Corretions to Top Decays and Impact on Jet Activity at the LHC", Workshop on Standard Model Physics (and more) at the LHC (top quark working group), CERN, Geneva, Switzerland, April 1999.

"Parton Shower Simulations in High Energy Physics", Graduate Student Symposium, Oxford, U. K., May 1999.

"Gluon Radiation in Vector Boson Production at Hadron Colliders", UK Phenomenology Workshop on Collider Physics (QCD working group), Durham, U. K., September 1999.

"Issues on the Top Mass Reconstruction" UK Phenomenology Workshop on Collider Physics, (QCD working group), Durham, U. K., September 1999.

"Parton Showers in Vector Boson Production", Workshop on Standard Model Physics (and more) at the LHC (QCD working group), CERN, Geneva, Switzerland, October 1999..

"Parton Showering in Top Production and Decay", Berkeley 2000, Linear Collider Workshop (top quark working group), Berkeley, CA, March 2000.

"Gluon Radiation in Vector Boson Production", Pheno 2000 Symposium, Madison, WI, U. S. A., April 2000.

"Vector Bosons at Hadron Colliders: Parton Showers and Resummations" MRST Meeting, Rochester, NY, U. S. A., May 2000.

"Studies on the Top Mass Reconstruction at the Linear Collider" Linear Collider Workshop (top quark working group), Columbus, OH, U. S. A., August 2000.

"Top Mass Reconstruction at the LHC", DPF 2000, Columbus, OH, U. S. A., August 2000.

"Monte Carlo Studies of Top Production and Decay", Linear Collider Workshop - LCSW2000, Fermilab, October 2000.

"HERWIG for Top Physics", Thinkshop [2], Fermilab, November 2000.

"Matrix-element Corrections to HERWIG", Monte Carlo Generator Physics for Run II at the Tevatron, Fermilab, April 2001.

"Challenges in QCD Event Generators", Second Young-Researchers QCD-Network Meeting, Parma, Italy, February 2002.

"Top Decay and Bottom Fragmentation in NLO QCD", Recontres de Moriond, Les Arcs, France, March 2002.

"Resummation in Top Quark Decay", Workshop on Tev-Scale Physics, Cambridge, U. K., July 2002.

"Challenges in Heavy Quark Fragmentation", Max-Planck-Institut Young Scientists' Workshop 2002, Ringberg Castle, Germany, July 2002.

"Bottom Quark Mass Determination", QCD 03, Montpellier, France, July 2003.

"Bottom Quark Mass Determination from Low-n Sum Rules", CERN Phenomenology Club, March 2004.

"Matching HERWIG Parton Showers and Exact Matrix Elements", HERA and the LHC Workshop (multi-jet final states and energy flows working group), CERN, March 2004.

"Bottom Quark Fragmentation in Top Quark Decay", Incontri di Fisica delle Alte Energie, Torino, Italy, April 2004.

"Bottom Quark Mass Determination from Relativistic Sum Rules", Incontri di Fisica delle Alte Energie, Torino, Italy, April 2004.

"Bottom Quark Fragmentation in Top Decay", QFTHEP 2004, Peterhof, S. Petersburg, Russia, June 2004.

"Impact of Soft Resummation on Structure Functions" (parton distribution functions working group), HERA and the LHC Workshop, CERN, October 2004.

"Resummed Parton Distributions from Neutrino Data" (parton distribution functions working group), HERA and the LHC Workshop, CERN, January 2005.

"Bottom Fragmentation in $H \to b\bar{b}$ Events", Incontri di Fisica delle Alte Energie, Catania, March 2005.

"Impact of large-x Resummation on parton distributions", DIS05, Madison, WI, April 2005.

"Summary talk of the Heavy Flavour Working Group", DIS05, Madison, WI, May 2005.

"Bottom Fragmentation in Higgs and Top Decay", Workshop "Physics at TeV Colliders", Les Houches, France, May 2005.

"Soft-resummation effects on parton densities", CERN Phenomenology Club, August 2005.

"Bottom Quark Fragmentation in Top Quark Decay", TOP 2006, Coimbra, Portugal, January 2006.

"Soft Resummation Corrections to Parton Distributions", Diffraction 2006, Adamantas, Milos, Greece, Settembre 2006.

"Comparing Tuned Event Generators and Resummed Calculations for Bottom Quark Fragmentation", Monte Carlo Workshop MCWS, Laboratori Nazionali di Frascati, Italy, October 2006.

"Studies of QCD and Top Quark Physics at the Linear Collider", Linear Collider Workshop, Laboratori Nazionali di Frascati, Italy, October 2006.

"Monte Carlo generators for present and future colliders", Journal Club, Laboratori Nazionali di Frascati, Italy, March 2007.

"Parton showers and resummations for non-global QCD observables", HERA and the LHC Workshop, DESY, Hamburg, Germany, March 2007.

"Monte Carlo Generators for Top Physics at the LHC", V Workshop Italiano sulla Fisica *pp* a LHC, Perugia, Italy, January 2008.

"Heavy-Quark Fragmentation with an Effective Coupling Constant", Workshop on Parton Fragmentation Processes in the Vacuum and in the Medium, ECT*, Trento, Italy, February 2008.

"Standard Model and New Physics: summary talk", IFAE, Bologna, March 2008.

"Bottom quark fragmentation and impact on the uncertainty on the top mass reconstruction", workshop "Top quark physics: from the Tevatron to the LHC", CERN, June 2009.

"Heavy-quark Fragmentation", International School of Subnuclear Physics, Erice, Italy, September 2009.

"Towards Q-HERWIG: an angular-ordered parton shower generator for jet quenching", Brookhaven National Laboratory, TECHQM workshop, December 2009 (via videoconference).

"Parton showers with medium-modified splitting functions", DIS 2010, Firenze, April 2010.

"Heavy Flavours in DIS and Hadron Colliders: Theory Summary", DIS 2010, Firenze, April 2010.

"Theoretical issues in top mass reconstruction at hadron colliders", TOP 2010, 3rd International Workshop on Top Quark Physics, Bruges, June 2010.

"Summary of the Open Heavy Flavour Working Group", Quarkonium 2010, Palaiseau, France, July 2010.

"Parton showers with medium-modified splitting functions", Institute on "The first heavy ion collisions at the LHC", CERN, August 2010.

"Progress in medium-modified parton showers", Spring Institute, Laboratori Nazionali di Frascati, Italy, March 2011.

"Z' production in an extended MSSM", DIS2012, Bonn, Germany, March 2012.

"Z' production at the LHC in an extended MSSM", Rencontres de Blois, Blois, France, May 2012.

"Supersymmetric contributions to Z' decays", Bari Theory Christmas Workshop, Bari, December 2012.

"Searching for supersymmetry in Z' decays", LHCP 2013, Barcelona, Spain, May 2013.

"Bottom fragmentation in top decays and impact on the top mass reconstruction", Top Quark Working Group Plenary Meeting, CERN, November 2013.

'Bottom fragmentation in top decays and impact on the top mass reconstruction", Bari Theory Christmas Workshop, Bari, December 2013.

"Hadronization systematics and top-quark mass", Top Quark Working Group Plenary Meeting, CERN, May 2014.

"Bottom fragmentation in top decays and impact on the top mass measurement", QCD@work, Giovinazzo (BA), June 2014.

"Large-x resummation and impact on parton densities", HiX2014, November 2014, Laboratori Nazionali di Frascati, Italy.

"Perspectives in top quark and electroweak precision physics", What Next mid-term meeting, Laboratori Nazionali di Frascati, April 2015.

"Summary of LNF workshop on the top-quark mass", Top Quark Working Group Plenary Meeting, CERN, May 2015.

"Searching for supersymmetry in Z' decays at the LHC", PLANCK 2015, Ioannina, Greece, May 2015.

"Interpretation of the top-quark mass measurements: a theory overview", TOP 2015, Ischia, Italy, September 2015.

"Precision measurements of the top mass: theory vs experiment" FCC-ee Mini-Workshop 'Physics Behind Precision', CERN, February 2016.

"Searching for Supersymmetry and Dark Matter in Z' decays at LHC", DM 2016, Santander, Spain, June 2016.

"Challenges in Heavy-Quark Fragmentation", Workshop on Parton Radiation and Fragmentation from LHC to FCC-ee, CERN, November 2016.

"Interpretation of the top-quark mass results", DIS 2017, Birmingham, UK, April 2017.

"Supersymmetric signals in Z' decays", DIS 2017, Birmingham, UK, April 2017.

"Supersymmetric signals in Z' decays", Spring Institute, Laboratori Nazionali di Frascati, May 2017.

"Top-quark mass determination at LHC: a theory overview", EPS-HEP, Venice, July 2017.

"Supersymmetric signals in Z' decays at the LHC", EPS-HEP, Venice, July 2017.

"The top-quark mass: uncertainties due to b-quark fragmentation", QCD@LHC, Debrecen, Ungheria, September 2017.

"Non-standard heavy vector bosons at the LHC", QCD@LHC, Debrecen, Ungheria, September 2017.

"Z' bosons in supersymmetric and leptophobic scenarios", HL/HE-LHC Workshop, CERN, June 2018.

"Bileptons at LHC", SUSY 2018, Barcelona, Spain, July 2018.

"The top-quark mass: uncertainties due to bottom fragmentation", SUSY 2018, Barcelona, Spain, July 2018.

"Loopholes in Z' searches: exploring supersymmetry and leptophobia", SUSY 2018, Barcellona, Spain, July 2018.

Seminar Talks:

"QCD Event Generators", University of Bari, Italy, November 1999.

"Matrix Element Corrections to Parton Shower Simulations", Michigan State University, East Lansing, MI, U. S. A., December 1999.

"Matrix Element Corrections to Parton Shower Simulations", University of Rochester, NY, U. S. A., January 2000.

"Matrix Element Corrections to Parton Shower Simulations": Rutherford Appleton Laboratory, U. K., February 2000.

"Matrix Element Corrections to Parton Shower Simulations", University of Edinburgh, U. K., October 2000.

"Matrix Element Corrections to Parton Shower Simulations", University of Manchester, U. K., October 2000.

"Recent Progresses in the Physics of QCD Event Generators", University of Pavia, Italy, October 2000.

"Monte Carlo Parton Showers for High Energy Colliders", University of Michigan, Ann Arbour, MI, U. S. A., March 2001.

"Theory and Simulation of Multiple Radiation in QCD", University of Bari, Italy, May 2001.

"Challenges in the Physics of QCD Event Generators", Fermilab, August 2001.

"Physics of QCD Event Generators", Colloquium at Max-Planck-Institut für Physik, München, Germany, January 2002.

"Bottom Fragmentation in Top Quark Decay", University of Milano–Bicocca, Italy, February 2002.

"QCD Analysis of Bottom Fragmentation in Top Decay", University of Cambridge, U. K., May 2002.

"QCD Analysis of Bottom Fragmentation in Top Decay", University of Manchester, U. K., May 2002.

"Fragmentation Functions and B-Hadron Production in Top Quark Decay", University of Bari, Italy, July 2002.

"Heavy Quark Fragmentation and B-Hadron Production in Top Quark Decay", Max-Planck-Institut für Physik, München, Germany, November 2002.

"Physics of QCD event generators", University of Lecce, Italy, January 2003.

"Fragmentation functions and B-Hadron production in Top Quark Decay", University of Lecce, Italy, January 2003.

"Top Quark Decay and Bottom Quark Fragmentation", University of Uppsala, Sweden, March 2003.

"Matrix-element corrections to Monte Carlo parton showers", University of Uppsala, Sweden, March 2003.

"Top Quark Decay and Bottom Quark Fragmentation", University of Lund, Sweden, March 2003.

"Matrix-element corrections to Monte Carlo parton showers", University of Lund, Sweden, March 2003.

"Precise QCD Calculations for Charged Current Deep Inelastic Scattering", University of Milano–Bicocca, Italy, October 2003.

"Precise QCD Calculations for Charged Current Deep Inelastic Scattering", Max-Planck-Institut für Physik, München, Germany, November 2003.

"Soft and Collinear Resummation from Top Decay to Deep Inelastic Scattering", CERN, March 2004.

"Radiative Corrections to Deep Inelastic Scattering Processes", University of Bari, Italy, March 2004.

"Soft and Collinear Resummation from Top Decay to Deep Inelastic Scattering", University of Florence, Italy, May 2004.

"Event Generators and Matrix Element Corrections", University of Pisa, May 2004.

"Matrix Element Corrections to Parton Shower Simulations", Moscow State University, Moscow, Russia, June 2004.

"Progresses in Heavy Quark Fragmentation", University of Milano–Bicocca, Italy, October 2004.

"Event Generators and Matrix Element Corrections", University of Trento, January 2005.

"Progress in Heavy-Quark Fragmentation and Soft Resummation", University of Rome 'La Sapienza', June 2005.

"Monte Carlo Generators for High Energy Colliders", University of Rome 'La Sapienza', Italy, February 2006.

"Monte Carlo Generators for High Energy Colliders", UNAM, Mexico City, March 2006.

"Monte Carlo Generators for High Energy Colliders", CINVESTAV, Mexico City, March 2006.

"Monte Carlo Generators for High Energy Colliders", University of Padua, October 2006.

"Monte Carlo Generators for High Energy Colliders", University of Pavia, December 2006.

"Monte Carlo Generators for High Energy Colliders", Scuola Normale Superiore, Pisa, January 2007.

"Monte Carlo Generators for High Energy Colliders", Università della Calabria, Arcavacata di Rende (CS), February 2007.

"Monte Carlo Generators for the LHC", University of Buenos Aires, Argentina, August 2007.

"Challenges in Heavy Quark Fragmentation", University of la Plata, Argentina, August 2007.

"New Physics Signals and Standard Model Backgrounds at the LHC", Centro Enrico Fermi, Rome, Italy, September 2007.

"Simplified Models for New Physics Searches at the LHC", Scuola Normale Superiore, Pisa, Italy, November 2008.

"Monte Carlo Generators for High Energy Colliders", University of Ferrara, Italy, May 2009.

"Monte Carlo Generators for the LHC", Universidad Autonoma de Madrid, Spain, October 2010.

"Challenges in heavy quark fragmentation", Scuola Normale Superiore, Pisa, Italy, November 2010.

"Parton showers with medium-modified splitting functions", Laboratori Nazionali di Frascati, Italy, March 2011.

"Towards angular-ordered parton showers for heavy-ion collisions", Laboratori Nazionali di Frascati, Italy, March 2011.

"Supersymmetric contributions to Z' decays", University of Louvain-la-Neuve, Belgium, Italy, November 2012.

"Supersymmetric contributions to Z' decays", University of Bruxelles, Belgium, October 2012.

"Supersymmetric contributions to Z' decays", CERN, November 2012.

"Bottom fragmentation in top decays and impact on the top mass reconstruction", University of Barcelona, Spain, December 2013.

"Theoretical uncertainties in the determination of the top mass", SISSA, Trieste, Italy, September 2014.

"Interpretation of the top mass measurements", University of Manchester, UK, November 2015.

"The top-quark mass: interpretation of the measurements and theoretical uncertainties", University of Turin, Italy, February 2016.

"Parton showers and resummation for bottom-quark fragmentation in top decays", University of Vienna, Austria, April 2016.

"The top-quark mass: interpretation of the measurements and theoretical uncertainties", University of Rome Tor Vergata, Italy, February 2017.

"Non-standard heavy vector bosons at the LHC", University of Münster, Germany, October 2017.

Talks to the D0 Collaboration:

I was invited to join meetings of the D0 Collaboration and gave the following presentations:

"Matrix Element Corrections to Parton Showers", D0 Collaboration Meeting, plenary talk, Fermilab, April 2000. The talk was attended by the CDF Collaboration as well.

"Cards in HERWIG", meeting of the Monte Carlo event generator working group, Fermilab, November 2000.

Talks to the CDF Collaboration:

I was invited to join meetings of the CDF Collaboration and gave the following presentations:

"The New HERWIG Monte Carlo Event Generator", meeting of the Supersymmetry working group, Fermilab, August 2001.

"HERWIG Progress Report", meeting of the QCD working group, Fermilab, August 2001.

"Bottom Quark Fragmentation in Top Quark Events", CDF-Italia meeting, Trento, March 2004.

Talks to the CMS Collaboration:

I was invited to join meetings of the CMS Collaboration and gave the following presentations:

"Bottom Quark Fragmentation in Higgs decays", CERN, October 2004.

"Theoretical issues on b-quark fragmentation in top-quark decays", CERN, April 2013.

Talks to the ATLAS Collaboration:

I was invited to join meetings of the ATLAS Collaboration and gave the following presentations:

"Prospects for top quark phenomenology at the Large Hadron Collider", ATLAS Italy Meeting, Bologna, January 2014.

"Searching for supersymmetry in Z' decays", ATLAS SUSY Working Group, May 2015.

"The top-quark mass: exploring the hadronization uncertainties", ATLAS Top Working Group, February 2018.

Talks to the ALICE Collaboration:

I was invited to join meetings of the ALICE Collaboration and gave the following presentation:

"Towards angular-ordered parton showers for heavy-ion collisions", Laboratori Nazionali di Frascati, Italy, May 2011.

Supervising activity:

I collaborated with Prof. Lynne H. Orr on the supervision of the research activity of two graduate students at the University of Rochester: Elinor K. Irish and Alexander D. Mitov (currently postdoctoral research associate at SUNY Stony Brook, NY, U. S. A.). Such a work has been published and presented in several workshops and conferences.

In particular, the work with E.K. Irish has been carried out throughout the top-quark working group of the American Linear Collider workshop and published in Refs. [14,16].

The work with A.D. Mitov has been devoted to the topic of heavy-quark fragmentation and soft-gluon resummation. It was published in Refs. [18,20,21,24] and in his Ph.D. thesis "Applications of perturbative QCD to process with heavy quarks", hep-ph/0311101.

I collaborated with Dr. Ugo Aglietti on the supervision of Giancarlo Ferrera, currently postdoctoral fellow at the University of Florence, former graduate student at the University of Rome 'La Sapienza'. The publications [40,41], discussing a model for non-perturbative effects in bottom and charm-quark fragmentation, is part of his Ph.D. thesis 'Threshold resummation in heavy flavour physics'.

Together with Prof. Riccardo Barbieri, I have been following the Ph.D. thesis work of Antonio Enrique Cárcamo Hernández, currently fourth-year graduate student at Scuola Normale Superiore in Pisa. His thesis will deal with heavy composite-vector production at the Large Hadron Collider in Higgsless models and has led to the publication [53].

I have been involved in the supervision of the Master Thesis of Filippo Sala, undergraduate student at Scuola Normale Superiore, who has been working on Dark Matter interactions into Standard Model particles, and subsequent parton showers and hadronization. The title of his thesis is: 'Radiative Corrections to Dark Matter Indirect Signals'; the main aspects of this work are discussed in Ref. [58] of the publication list.

I have supervised Francesca Pelusi, Summer Student at the Frascati National Labs, on a project on the searches for Axion-Like Particles (ALPS) at the PADME experiment.

Lecturing activity:

I gave lectures on perturbative QCD at "Max-Planck-Institut Young Scientists Workshop on Hot Topics in Particle and Astroparticle Physics 2003", Ringberg Castle, Germany, July 2003. The course was followed by undergraduate and graduate students from Max-Planck-Institut für Physik, Ludwig-Maximilian-Universität and Technische Universität in Munich.

I lectured on "Monte Carlo tools for the LHC" at the "Italo-Hellenic School of Physics 2005. The Physics of LHC: theoretical tools and experimental challenges", Martignano (Lecce), Italy, June 2005.

I gave a course on "Selected topics in perturbative QCD" at UNAM, Mexico City, March 2006, during my visit associated with the HELEN project.

I lectured on "Physics of QCD event generators" to graduate and undergraduate physics students at the University of Rome Tor Vergata in April 2008.

I taught classes on perturbative QCD to graduate students at Scuola Normale Superiore in Pisa in March 2010.

Referee activity:

I have been a referee for Physics Letters B, European Physical Journal, Physical Review D, Physical Review Letters, JHEP, Canadian Journal of Physics, Nuovo Cimento, Computer Physics Communications.

I have been a reviewer for projects submitted to Fonds Wetenschappelijk Onderzoek (Belgium), Swiss National Foundation, Iran National Science Foundation, Estonian Research Concil and for the Evaluation of the Research Quality (VQR) of Italian universities.

Community service:

I was the theory convener at the "Heavy Flavours" session at DIS 2005, 13th International Workshop on Deep Inelastic Scattering, April 2005, Madison, WI, U. S. A.

I was a Discussion Leader at the 2006 European School of High Energy Physics Aronsborg, Sweden, June 2006, organized by CERN (Geneva) and JINR (Dubna).

I have been the convener of the "QCD and top-quark physics" working group of the Italian initiative for the future Linear Collider. The related meetings have so far been: "ILC in Florence", Florence, September 2007; "LC08: e^+e^- Physics at the TeV Scale", Frascati, September 2008; "LC09 - e^+e^- Physics at the TeV Scale and the Dark Matter Connection", Perugia, September 2009; "LC10 - New Physics: complementarities between direct and indirect searches", Frascati, December 2010. -LC11 Workshop - Understanding QCD at linear colliders in searching for old and new physics, ECT*, Trento, Italy, September 2011; -LC13: exploring QCD from the infrared regime to heavy-flavour scales at B-factories, the LHC and a Linear Collider, ECT*, Trento, Italy, September 2013.

I have been an organizer of 'LFC15: physics prospects for Linear and other Future Colliders after the discovery of the Higgs', September 2015, and the Chairman of 'LFC17: Old and New Strong Interactions from LHC to Future Colliders', September 2017, 'LFC19: Strong Dynamics for Physics within and beyond the Standard Model at LHC and Future Colliders', September 2019, 'LFC21: Strong Dynamics for Physics within and beyond the Standard Model at LHC and Future Colliders' (online workshop), September 2021, all held

at ECT*, Trento, Italy.

I co-organized the top quark session at the workshop on *pp* physics at the LHC in Perugia, January 2008, and the Standard Model and New Physics working group at the "IFAE" conference, Bologna, March 2008.

I was a scientific secretary for the lectures on "Orientifold/Flux String vacua, supersymmetry breaking and Strings at the LHC", given by Prof. D. Lüst at the International School of Subnuclear Physics, Erice, September 2009.

I have been a member of a few committees to evaluate Master and Ph.D. theses in theoretical particle physics at Scuola Normale Superiore, Pisa, in 2009 and 2010.

I have been a member of the selection committee for the admission to the graduate school in Rome 3 Univrsity, October 2020.

I have been the theory convener of the session on "Heavy Flavours in Deep Inelastic Scattering and Hadron Colliders" at the 18th International Workshop On Deep Inelastic Scattering And Related Subjects (DIS 10), Florence, Italy, April 2010.

I have been a convener of the working group on 'Open heavy flavour (vs hidden)' at the workshop 'Quarkonium 2010 - Three days of Quarkonium Production', which took place at the École Polytechnique in Palaiseau, France, in July 2010.

I have been the Colloquium Organizer at INFN, Laboratori Nazionali di Frascati, 2018-2020.

Publications and contributions to conference proceedings:

[1] P. Colangelo, G. Corcella and G. Nardulli, "$\Upsilon(4S) \to B^0\bar{B}^0\gamma$ Background at B Factories", hep-ph/9510337, Phys. Rev. D54 (1996) 1212.

[2] P. Colangelo and G. Corcella, "Investigations on CPT Invariance at B-Factories", hep-ph/9704375, Eur. Phys. J. C1 (1998) 515.

[3] G. Corcella and M.H. Seymour, "Matrix Element Corrections to Parton Shower Simulations of Heavy Quark Decay", hep-ph/9809451, Phys. Lett. B442 (1998) 417.

[4] G. Corcella and M.H. Seymour, "Initial State Radiation in Simulations of Vector Boson Production at Hadron Colliders", hep-ph/9908388, Nucl. Phys. B565 (2000) 227.

[5] G. Corcella and M.H. Seymour, "Simulations of Top Production and Decay at the Linear Collider", hep-ph/9911335, in "2nd ECFA/DESY Study 1998-2001", pp. 265-270.

[6] G. Corcella, "On the Top Mass Reconstruction Using Leptons", hep-ph/9911477, in Proceedings of UK Phenomenology Workshop on Collider Physics, J. Phys. G26 (2000) 634.

[7] G. Corcella, I.G. Knowles, G. Marchesini, S. Moretti, K. Odagiri, P. Richardson, M.H. Seymour and B.R. Webber, "HERWIG 6.1 Release Note", hep-ph/9912396.

[8] G. Corcella and M.H. Seymour, "Vector Boson Transverse Momentum Distributions at the Tevatron", hep-ph/9911536, in Proceedings of UK Phenomenology Workshop on Collider Physics, J. Phys. G26 (2000) 643.

[9] M. Beneke, G. Corcella et al., "Top Quark Physics", hep-ph/0003033, in Proceedings of the Workshop on Standard Model Physics (and more) at the LHC, edited by G. Altarelli and M.L. Mangano, pp.419-529.

[10] G. Corcella, M.L. Mangano and M.H. Seymour, "Jet Activity in $t\bar{t}$ Events and Top Mass Reconstruction at Hadron Colliders", hep-ph/0004179, JHEP 0007 (2000) 004.

[11] S. Catani, G. Corcella et al., "QCD", hep-ph/0005025, in Proceedings of the Workshop on Standard Model Physics (and more) at the LHC, edited by G. Altarelli and M.L. Mangano, pp. 1-115.

[12] G. Corcella, "Vector Boson Production at Hadron Colliders: Results From HERWIG and Resummed Calculations", hep-ph/0007295, in "Rochester 2000. Theoretical High Energy Physics" Proceedings of MRST Meeting, edited by C.R. Hagen, pp. 190-201.

[13] G. Corcella, "Top Mass Measurement and Bottom Fragmentation at the LHC", hep-ph/0009320, in Proceedings of DPF 2000 Meeting, Int. J. Mod. Phys. A 16S1A (2001) 372.

[14] G. Corcella, E.K. Irish and M.H. Seymour, "HERWIG for Top Physics at the Linear Collider", hep-ph/0012319, in "Batavia 2000, Physics and Experiments with Future Linear e^+e^- Colliders", pp. 356-359.

[15] G. Corcella, I.G. Knowles, G. Marchesini, S. Moretti, K. Odagiri, P. Richardson, M.H. Seymour and B.R. Webber, "HERWIG 6: an Event Generator for Hadron Emission Reactions with Interfering Gluons (Including Supersymmetric Processes)", hep-ph/0011363, JHEP 0101 (2001) 010.

[16] T. Abe, G. Corcella et al., "Linear Collider Physics Resource Book for Snowmass 2001. Chapter 6: Top Quark Physics", hep-ex/0106057.

[17] G. Corcella, I.G. Knowles, G. Marchesini, S. Moretti, K. Odagiri, P. Richardson, M.H. Seymour and B.R. Webber, "HERWIG 6.3 Release Note", hep-ph/0107071.

[18] G. Corcella and A.D. Mitov, "Bottom Quark Fragmentation in Top Quark Decay", hep-ph/0110319, Nucl. Phys. B 623 (2002) 247.

[19] G. Corcella, I.G. Knowles, G. Marchesini, S. Moretti, K. Odagiri, P. Richardson, M.H. Seymour and B.R. Webber, "HERWIG 6.4 Release Note", hep-ph/0201201.

[20] G. Corcella and A.D. Mitov, "Top Decay and Bottom Fragmentation in NLO QCD", hep-ph/0205081, in Proceedings of 37th Rencontres de Moriond on QCD and Hadronic Interactions.

[21] M. Cacciari, G. Corcella and A.D. Mitov, "Soft-Gluon Resummation for Bottom Fragmentation in Top Quark Decay", hep-ph/0209204, JHEP 0212 (2002) 015.

[22] G. Corcella, I.G. Knowles, G. Marchesini, S. Moretti, K. Odagiri, P. Richardson, M.H. Seymour and B.R. Webber, "HERWIG 6.5 Release Note", hep-ph/0210213.

[23] G. Corcella and A.H. Hoang, "Uncertainties in the $\overline{\mathrm{MS}}$ Bottom Quark Mass from Relativistic Sum Rules", hep-ph/0212297, Phys. Lett. B 554 (2003) 133.

[24] G. Corcella and A.D. Mitov, "Soft-Gluon Resummation for Heavy Quark Production in Charged-Current Deep Inelastic Scattering", hep-ph/0308105, Nucl. Phys. B 676 (2004) 346.

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Frascati, 05.10..2021 Gennaro Corcella

Curriculum Vitae of Claudia Frugiuele

PERSONAL INFORMATION

- Frugiuele, Claudia
- Nationality: Italian
- Language: Italian (mother tongue), English (Proficiency), French (Fluent)

EDUCATION

- 10 November 2012 **Doctor of Philosophy- PhD**
  Physics specializing in High Energy Physics
  Institution: Department of Physics, Carleton University, Ottawa, Canada.
  Supervisor: Prof. Thomas Gregoire.
  Thesis: *"New definitions of old symmetries in Little Higgs and Supersymmetric models "*.
  In the pursuit of my PhD, I have had the chance to study between Edinburgh (where I initially started with the goal on working on pQCD), Ottawa and New York. International mobility fostered my scientific independence and opened partnership with professors and students from different universities.
- 11 July 2007 **Laurea Magistrale (Equivalent to a Master of Science)**
  Institution: Dipartimento di Fisica, Universita' degli Studi di Milano, Italia.
  Supervisor: Prof. S. Forte.
  Thesis: *"Matching small x resummation to Altarelli-Parisi splitting functions"*.
  Final degree mark: 110/110 *magna cum laude*
- 27 October 2004 **Laurea Triennale (Equivalent to a Bachelor of Science)**
  Institution: Dipartimento di Fisica, Universita' degli Studi di Milano, Italia.
  Supervisors: Prof. Rodolfo Bonifacio and Prof. Enrico Bellone
  Thesis: *"The problem of completeness and locality in quantum mechanics"*.
  Final degree mark: 110/110 *magna cum laude*

CURRENT POSITION

- November 2019- **Ricercatore INFN livello 3 fascia 1**, presso Via Celoria 16,20100 MILANO
  *I recently accepted a **tenure track position at Brookhaven National Laboratory (BNL)**,USA where I will move in spring/summer 2020.*

PREVIOUS POSITION

- April 2019-November 2019 **Fellow**, CERN, Switzerland.
- Dec. 2015-Dec.2018 **Postdoctoral Research Associate**, Weizmann Institute of Science, Israel.
- 08 Oct.2012-08 Oct.2015, **Postdoctoral Research Associate**, Fermi National Laboratory, USA

FELLOWSHIPS

2015–2017 **Dean Fellowship**, Feinberg Graduate School, Weizmann Institute of Science, Israel.
2018–2019 **Excellence Fellowship**, Feinberg Graduate School, Weizmann Institute of Science, Israel.

TEACHING ACTIVITIES

- Grader of the PHYS 3701- Elements of Quantum Mechanics Carleton University; 2010 and 2010
- Grader of PHYS 4201 - Astrophysics Carleton University; 2010.
- Grader of the PHYS 3402 - Heat and Thermodynamics, Carleton University; 2010
- Grader of PHYS 2604 - Modern Physics I Carleton University; 2009 and 2010.
- Grader of PHYS 3802 -Advanced Dynamics Carleton University; 2009 .
- Teaching assistant of Quantum Theory, University of Edinburgh; 2009.

- Teaching assistant of Symmetries of Quantum Mechanics, University of Edinburgh; 2009.

ORGANISATION OF SCIENTIFIC MEETINGS

- **2019** Convener of Light Dark Matter Workshop, Venice 22-26 November 2019
- **2019** Member of the organising committee of the BNL Forum 2019,
  "Particle Physics and Cosmology in the '20s" Upton (NY) 25-27 September 2019
- **2019** Organiser of Galileo Galilei Institute (GGI) workshop:
  "New Frontiers in the Search for Dark Matter"
- **2018** Organiser of Weizmann Institute of Science high energy theory seminars
- **2017** Organiser of the SRitp Workshop Weizmann Institute
  "BSM in direct, indirect and tabletop experiments",

REVIEWING ACTIVITIES

- Referee for Physical Review Letters, JHEP, Physical Review D, Physical Review B.

OUTREACH

- **2016** QuarkNet workshop at Hill Side summer school in Addis Ababa (Ethiopia) where I previously volunteered together with Ken Cecire and Tom McCauley (Notre Dame U).
- **2016** Member of the outreach team at the African CERN Summer school, Kigali, Rwanda.
- **2015** Visitors at *AIMS (African Institute of Math and Science)* and at University of Dakar to give an introductory talk on Particle Physics to physics graduate students.
- **2015** Volunteer as math and science teacher at "Hill Side" High School in Addis Ababa (Ethiopia).
- **2015** Volunteer at the *"Upward Bound"* program of the *University of Chicago*. The program is designed for students who come from lower incomes families of the South Side of Chicago and who want to prepare for a successful education.
- **2014 and 2015** Volunteer in the events *"Expanding your horizons"* in Chicago. Expanding your Horizons (EYH) is a one day conference for middle school girls engaging them towards science, technology, engineering and math (STEM) careers.
- **2011** Collaboration with artist Gautam Rangan for an interactive exhibition on art and science.
- **2010** Volunteer at the *Exploratorium* (museum of science) in San Francisco

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

- **Since 2015,** I worked with three PhD students at Weizmann Institute (D. Aloni, Dr. A. Efrati, A. Dery), with two of them I published one paper and with one two papers (A.Dery).
- I have been mentoring a younger postdoctoral fellow at Weizmann, Dr. E. Fuchs, since **fall 2015** writing with her five papers (one of them without any senior colleague).
- I am **currently** working with a PhD student, L.Buonocore, (shared between University of Naples and Zurich University) on developing a MonteCarlo tool to study new physics phenomenology at fixed-target experiments. For a related project, I have been working closely with a Master student (M.Ferillo) in experimental particle physics at University of Naples to estimate the sensitivity of the proposed ShiP experiment to light Dark Matter. This effort is directed towards the final document for the "Physics Beyond Colliders" initiative at CERN.

COLLABORATIONS

- **Theoretical particle physics:** Dr. B. Dobrescu (Fermilab), Dr. R. Harnik (Fermilab), Prof. Y. Nir (Weizmann Institute), Prof. Y. Nir (Weizmann Institute), Prof. G.Perez (Weizmann Institute)
- **Atomic physics:** Prof. Berengut (UNSW), Prof. D.Budker (Mainz), Prof. V. Flambaum (UNSW), Dr. E. Mocchiutti (INFN), Prof. R. Ozeri (Weizmann Institute), Dr. Y. Stadnik (Mainz)
- **MadDump team**: L. Buonocore (U.Napoli), Prof. F. Maltoni (Leuven), Dr. O. Mattelaer (Leuven), and F. Tramontano (U. Napoli)
- **Neutrino experiments**: Dr. A. Habig (Fermilab), Dr. O. Palamara (Fermilab)

INVITED TALKS AND SEMINARS

I am regularly invited to give presentations at leading international conferences in my field, both on my own work and on overviews and perspectives of my whole research field. Since 2012, **I have been invited to give seminars to over 30 Universities and Research Centers all over the world, and more than 25 to conferences and workshops**. I have been a **visiting scientist** for periods longer than 2 weeks during the following competitive programs: Aspen summer institute, Kavli Institute for Theoretical Physics, Munich Institute for Astro and Particle Physics (MIAPP) , Galileo Galilei Institute for Physics (GGI), and Mainz Institute for Theoretical Physics (MITP).

Here a list of selected invited plenary talks:

1. **Neutrino 2020 30 June 2020 - Virtual conference.**
2. "Dark Matter/Dark Sectors searches at fixed target experiments" , **CERN Council Open Symposium on the Update of European Strategy for Particle Physics 13-16 May 2019 - Granada, Spain.**
3. **Light Dark Matter models and searches** Universita' Roma 3, December 2018,
4. **Beyond Standard Model: Where do we go from here? Johns Hopkins Workshop Series** Florence (US) 2018,
5. **The Small-Scale Structure of Cold(?) Dark Matter conference**,
   Santa Barbara (USA) May 2018, invited plenary talk: "Searching for light dark matter @ neutrino facilities ";
6. **Aspen Winter 2018- The Particle Frontier**,
   Aspen (USA) April 2018, invited plenary talk: "Searching for light dark matter @ neutrino facilities ";
7. **Top 2017-10th International Workshop on Top Quark Physics**,
   Braga (Portugal) September 2017, invited plenary talk: "Overview on naturalness ";
8. **Invisible 2017 workshop**,
   Zurich (Switzerland) June 2017, invited plenary talk: "Dark matter beams at proton fixed target experiments ";
9. **The International Workshop on Light Dark Matter @ Accelerators (LDMA)** ,
   Isola D'Elba (Italy) May 2017, invited plenary talk: "Dark matter beams at proton fixed target experiments ";
10. **20th International Conference From the Planck Scale to the Electroweak Scale (Planck 2017)**,
    Warsaw (Poland) May 2017, invited parallel talk: "Atomic probes of new physics ";
11. **U.S. Cosmic Visions: New Ideas in Dark Matter**,
    University of Maryland, USA March 2017, invited parallel talk: "Dark matter off axis detectors for SHIP and LBNF ";
12. **CERN-EPFL-Korea Theory Institute "New Physics at the Intensity Frontier"**,
    CERN (Switzerland) February 2017, invited plenary talk: "Dark matter off axis detectors for SHIP and LBNF ";
13. **Reinterpreting the results of new physics searches at the LHC**,
    CERN (Switzerland) December 2016, invited plenary talk: "Exotic scalars at the LHC ";
14. **The LHC Awakens: A New Energy Frontier, Summer Aspen workshop**,
    Aspen Center for Physics, USA August 2016, invited talk: "Exotic scalars at the LHC ";

15. **Charting the Unknown: interpreting LHC data from the energy frontier** ,
CERN (Switzerland) July 2016, invited plenary talk: "'Dark matter (and relaxion) beams at proton fixed target experiments ";

16. **The lesson from the first results of Run 2 of the LHC (3rd NPKI workshop)** ,
Seul (Korea) June 2016, invited plenary talk: "'Atomic probes of long range forces ";

17. **New Directions to Shed Light on Dark Matter, Summer Aspen workshop**,
Aspen Center for Physics, USA August 2015, invited talk: "Off axis detectors for LBNF ";

18. **KEK-PH 2014**,
KEK (Japan), Octber 2014, invited talk: "Hidden GeV-scale interactions of quarks and dark matter ";

19. **Goal 8: going beyond LHC 8** ,
ICTP SAFR, Sao Paulo (Brazil) August 2014, invited plenary talk: "'Dirac gauginos, R symmetry and the 125 GeV Higgs ";

20. **New perspectives on dark matter** ,
Fermilab (USA) May 2014, invited plenary talk: "'Light dark matter discovery prospects with MINOS and NOVA ";

21. **Goal 8: going beyond LHC 8** ,
Natal (Brazil) September 2013, invited plenary talk: "'Dirac gauginos, R symmetry and the 125 GeV Higgs ";

22. **GGI workshop, Beyond the Standard model after the first run of the LHC** ,
Florence (Italy) June 2013, invited talk: "'Stops mixing at the LHC ";

ACADEMIC REFERENCES

- **Dr. Bogdan Dobrescu** Senior scientist at Fermi National Laboratory (Fermilab)
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- **Prof. Stefano Forte** Professore ordinario presso Universita' degli Studi di Milano
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- **Prof. Thomas Gregoire** Associate Professor Carleton University (Ottawa, Canada)
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- **Dr. Roni Harnik** Senior scientist at Fermi National Laboratory (Fermilab)
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- **Prof. Yosef Nir** Full Professor at Weizmann Institute of Science
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- **Prof. Gilad Perez** Associate Professor at Weizmann Institute of Science
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- **Prof. Eduardo Ponton** Full Professor ICTP Sao Paulo-SAIFR
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1 Publication List

1. C. Ahdida *et al.* [SHiP], *"Sensitivity of the SHiP experiment to light dark matter," arXiv:2010.11057 [hep-ex].*

2. L. Buonocore, C. Frugiuele and P. deNiverville, *Hunt for sub-GeV dark matter at neutrino facilities: A survey of past and present experiments, Phys. Rev. D* ***102****, no.3, 035006 (2020) doi:10.1103/PhysRevD.102.035006 [arXiv:1912.09346 [hep-ph]]*

3. C. Frugiuele, J.Perez-Rios,C.Peset, *Current and future perspectives of positronium and muonium spectroscopy as dark sectors probe , arXiv:1902.08585. Phys.Rev.D 100 (2019) 1, 015010*

4. L. Buonocore, C. Frugiuele, F. Maltoni, O. Mattelaer, F. Tramontano. *Event generation for beam dump experiments , arXiv:1812.06771 JHEP 1905 (2019) 028*

5. C. Frugiuele, E. Fuchs, G. Perez, M. Schlaffer *Relaxion and light scalars at the HL-LHC and lepton colliders*, JHEP 1810 (2018) 151

6. C. Frugiuele and P. DeNeverville, *Hunting sub-GeV dark matter with NOνA near detector*, arXiv:1807.06501[hep-ph]. Phys.Rev. D99 (2019) no.5, 051701 (Rapid communications)

7. A. Dery, C. Frugiuele and Y. Nir, *Large Higgs-electron Yukawa coupling in 2HDM* , JHEP 1804 (2018) 044 arXiv:1712.04514,[hep-ph].

8. C. Delaunay, C. Frugiuele, E. Fuchs, Y. Soreq, *Probing new spin-independent interactions through precision spectroscopy in atoms with few electrons*, PhysRevD.96.115002 arXiv:1709.02817,[hep-ph].

9. D. Aloni, A. Dery, C. Frugiuele and Y. Nir, *Testing Minimal Flavor Violation in Leptoquark Models of the $R_{K^{(*)}}$ Anomaly*, JHEP 1711 (2017) 109 [arXiv:1708.06161 ,[hep-ph]].

10. Julian C. Berengut, Dimtry Budker, Cedric Delaunay, Victor V. Flambaum,Claudia Frugiuele,Elina Fuchs,Christophe Grojean,Roni Harnik, Roee Ozeri, Gilad Perez, and Yotam Soreq, *Probing new light force-mediators by isotope shift spectroscopy*, Phys.Rev.Lett. 120, 091801 (2018) [arXiv:1704.05068 ,[hep-ph]].

11. C. Frugiuele, *Probing sub-GeV dark sectors via high energy proton beams at LBNF/DUNE and MiniBooNE*, arXiv:1701.05464 [hep-ph]. Phys.Rev. D96 (2017) no.1, 015029

12. K. Blum, A. Efrati, C. Frugiuele and Y. Nir, *Exotic colored scalars at the LHC*, arXiv:1610.06582 [hep-ph]. JHEP 1702 (2017) 104

13. T. Flacke, C. Frugiuele, E. Fuchs, R. S. Gupta and G. Perez, *Phenomenology of relaxion-Higgs mixing*, JHEP 1706 (2017) 050 arXiv:1610.02025 [hep-ph].

14. C.Frugiuele, E. Fuchs, G. Perez, and M. Schlaffer, *Constraining New Physics Models with Isotope Shift Spectroscopy*, arXiv:1602.04822 [hep-ph]. Phys.Rev. D96 (2017) no.1, 015011

15. P. Coloma, B. A. Dobrescu, C. Frugiuele, and R.Harnik, *Dark matter beams at LBNF*, arXiv:1512.03852 [hep-ph]. JHEP 1604 (2016) 047

16. E. Bertuzzo and C. Frugiuele, *A natural SM-like 126 GeV Higgs via non-decoupling D-terms*, arXiv:1412.2765 [hep-ph]. Phys.Rev. D93 (2016) no.3, 035019

17. B. A. Dobrescu and C. Frugiuele, *GeV-scale dark matter: production at the Main Injector*, arXiv:1410.1566 [hep-ph]. JHEP 1502 (2015) 019

18. W. Altmannshofer, C. Frugiuele and R. Harnik, *Fermion Hierarchy from Sfermion Anarchy*, arXiv:1409.2522 [hep-ph]. JHEP 1412 (2014) 180

19. B. A. Dobrescu and C. Frugiuele, *Hidden GeV-scale interactions of quarks*, arXiv:1404.3947 [hep-ph]. Phys.Rev.Lett. 113 (2014) 061801

20. E. Bertuzzo, C. Frugiuele, T. Gregoire and E. Ponton, *Dirac gauginos, R symmetry and the 125 GeV Higgs*, arXiv:1402.5432 [hep-ph]. JHEP 1504, 089 (2015).

21. P. Agrawal and C. Frugiuele, *Mixing stops at the LHC* , arXiv:1304.3068 [hep-ph]. JHEP 1401 (2014) 115

22. C. Frugiuele, T. Gregoire, P. Kumar and E. Ponton, *L=R' – $U(1)_R$ Lepton Number at the LHC*, arXiv:1210.5257 [hep-ph]. JHEP 1305(2013) 156

23. C. Frugiuele, T. Gregoire, P. Kumar and E. Ponton, *L=R' - $U(1)_R$ as the Origin of Leptonic 'RPV*, arXiv:1210.0541 [hep-ph]. JHEP 1303 (2013) 156

24. E. Bertuzzo, and C. Frugiuele, *Fitting neutrino physics with $U(1)_R$*, arXiv:1203.5340 [hep-ph]. JHEP 1205, 100 (2012)

25. C. Frugiuele and T. Gregoire, *Making the Sneutrino a Higgs with a $U(1)_R$ Lepton Number*, arXiv:1107.4634 [hep-ph]. Phys.Rev. D85 (2012) 015016

26. T. Brown, C. Frugiuele and T. Gregoire, *UV friendly T-parity in the SU(6)/Sp(6) little Higgs model,* JHEP 1106, 108 (2011) arXiv:1012.2060 [hep-ph]

REVIEWS

1. "The CLIC Potential for New Physics" , J. DeBlas *et al.*, : arXiv:1812.020

2. "Long-Lived Particles at the Energy Frontier: The MATHUSLA Physics Case" D. Curtin *et al.*, arXiv:1806.07396 [hep-ph].

3. "US Cosmic Visions: New Ideas in Dark Matter 2017: Community Report" M. Battaglieri *et al.*, arXiv:1707.04591 [hep-ph].

Curriculum of the Scientific Activity of Isabella Masina

Professional address: Dept. of Physics and Earth Sciences,
University of Ferrara, Via Saragat 1, I-44122 Ferrara, Italy
Professional website: http://docente.unife.it/isabella.masina
E-mail: masina@fe.infn.it
Citizenship: Italian
Languages: Italian (mother tongue), English (fluent), French (fluent)

Isabella Masina is, since 2008, assistant professor – Italian "ricercatore" – at the Dept. of Physics and Earth Sciences of the University of Ferrara, in the scientific sector FIS/02 (Fisica teorica, modelli e metodi matematici). She is associate member of the Istituto Nazionale di Fisica Nucleare (INFN), Sez. Ferrara. Since 2014, she is local coordinator of the "Theoretical Astroparticle Physics (TASP)" project supported by the INFN.

She is author of about 52 published papers – with h-index=30 and among which 1 top 500, 5 top 250, 10 top 100 and 6 top 50, according to Spires – in the domains of theoretical particle physics, astro-particle physics and cosmology. She presented her work at many international conferences and invited seminars. She is referee for many journals in her domain.

After having graduated *cum laude* in Physics in 1997 at the University of Ferrara, she got a Ph.D. in Physics in 2001 at the University of Padova. She was subsequently: post-doc at the Service de Physique Théorique of the Commisariat à l'Energie Atomique, CEA-Saclay, Gif-sur-Yvette, France; grant holder at the Centro Studi e Ricerche "E. Fermi", hosted by Rome I "La Sapienza" University, Rome, Italy; CERN fellow at the PH-TH Division, Geneva, Switzerland. In 2008 she got the position of "ricercatore" at the University of Ferrara. From 2009 to 2020 she was adjunct professor at the Centre for Particle Physics Phenomenology CP3-Origins, Southern Denmark University, Odense, Denmark. She was Scientific Associate at CERN in 2018.

She participated in the organization of about three international conferences and was active in the seminar organization at her host institutions. From 2014 to 2017 she was local coordinator of the PRIN 2012 project supported by the Italian Ministry of University and Research (MIUR) entitled "Theoretical and Astroparticle Physics".

Her teaching activity at the undergraduate and PhD level is focussed mainly in the domains of Quantum Mechanics, Quantum Field Theory, Standard Model and Astro-particle Physics. She was tutor of about six students (from Bachelor to PhD) and was active in the organization of the International Doctorate on AstroParticle Physics (IDAPP) program from 2009 to 2015. She is also active in outreach programs.

CURRICULUM VITÆ
Enrico NARDI

Personal Records

- **Nationality:** Italian.
- **Languages:** Italian, English, Spanish, French.
- **ORCID iD:** 0000-0001-7165-3808.
- **Mailing address:** INFN - Laboratori Nazionali di Frascati
  Via Enrico Fermi no. 40, 00044 Frascati (RM) Italy
  Tel.: +39 06 94032880 Cel.: +39 349 2232297
  E–mail: `enrico.nardi@lnf.infn.it`

Synopsis and highlights of scientific activity

Five papers single authored already during Ph.D./first postdoc (1990-1993). 0 papers with Ph.D./M.Sc. supervisors. More than 50 co-authors, mostly younger and international. Original contributions in: LEP physics, GUT models $[SU(5), SO(10), E_6]$, B-physics, SUSY without R-parity, neutrino physics (mass models, form factors, non-standard ν interactions, ν's from supernova and pulsars), flavour symmetries, leptogenesis, dark matter, axion physics and dark sectors. 4,700 citations to refereed articles with five or less authors. 100 citable papers (5,500 citations). h: 34. Supervision: 7 postdocs; 5 Ph.D., 4 M.Sc., 2 B.Sc. thesis. Chair of 18 international workshops/conferences/schools. Coordinator of the LNF Theory Group. Internal referee for INFN-CSN4 Astroparticle physics. Evaluator for both calls (2018, 2019) of the FELLINI - Fellowship for Innovation at INFN, co-financed through the EC Marie Sklodowska-Curie COFUND Action. Local Responsible of INFN-CSN4 Initiative on Theoretical Astroparticle Physics (TAsP).

Academic Education and Working Experience

Academic Education

1987: Degree in Theoretical Physics, University of Trieste, (110/110 *cum laude*)
1989: Master in Elementary Particle Physics, SISSA-ISAS, Trieste (30/30 *cum laude*)
1990: *Research Associate* in the Program for Advanced Graduate Student, CERN (CH)
1991: Ph. D in Elementary Particle Physics, SISSA-ISAS, Trieste

Postgraduate and working experience

1991-1994: Post-doctoral fellow, University of Michigan – Ann Arbor, (USA).
1994-1997: Research fellow, Feinberg Graduate School, Weizmann Institute of Science (IL)
1997-2009: Professor of Physics, Postgraduate program, University of Antioquia (CO)
2001-2008: INFN Researcher (level 3) - Laboratori Nazionali di Frascati (RM)
2009-2019 INFN Primo Ricercatore (level 2) - Laboratori Nazionali di Frascati (RM)
2010-2011: Visiting professor in the Master Program, Madrid Autonoma University & Institute for Theoretical Physics, Madrid (ES)
2018-2024: Italian ASN: "Abilitazione a professore di prima fascia, settore 02/A2" (with all required indicators well above the reference thresholds).

Present position

Since 01/01/2019: INFN Research Director (level 1) - Laboratori Nazionali di Frascati (RM)

Scientific leadership, institutional assignments and development

1999-2008: Head of the particle physics group GFIF, U. Antioquia (CO)
2002-present: Local responsible INFN "Iniziativa Specifica" TAsP (previously FA51)
2009-2011: Member of the LNF Selection Committee for "Assegni di Ricerca"
2011: Member of the INFN selection committee for INFN Postdoctoral Fellowships for non Italian citizens for the CSN4 IS FA51
2014-2017: Local LNF responsible for PRIN-2012 in Theoretical Astroparticle Physics
2015-2019: Coordinator of the Theory Group of the Frascati National Laboratories (1st term)
2015-2019: Internal referee for Astroparticle Theory, Linea 5 INFN CSN4 (1st term)
2016: President of the INFN selection committee for INFN Postdoctoral Fellowships for non Italian citizens for the INFN IS: TAsP
2017: President of the selection committee for LNF Summer Students (call n. 18789/17)
2017-present: Associated member of the European Organization for Nuclear research (CERN)
2018: Responsible of the LNF selection committee for INFN Postdoctoral Fellowships for non Italian citizens for the INFN IS: TAsP
2019-present: Responsible of the LNF postdoctoral position "Cabibbo Fellowship"
2015-present: Internal referee for Astroparticle Theory, Linea 5 INFN CSN4 (2nd term)
2019-present: Coordinator of the Theory Group of the Frascati National Laboratories (2nd term)

Early experience gained abroad, in developing the first Ph. D. program in theoretical particle physics in the Antioquia Department (CO) at the University of Antioquia, teaching a different course each semester to make up for the initial lack of sufficiently trained professors, setting up a HEP group with funding from several governmental and University grants, organizing international HEP schools, conferences and workshops in that country.

Awards

1989: *"Fondazione Della Riccia"* fellowship at the " Laboratoire de Physique Mathématique de l' Université de Languedoc ", Montpellier (FR)
2003-present: European member in the International Scientific Committee of the *"Latin American Symposium of High Energy Physics"*
2006: (U. Antioquia, Fac. Science) Parchment *"In recognition of the leadership of the HE group and for the contributions to the excellence and development of scientific research in the Faculty."*
2009: (U. Antioquia, Fac. Science) Plaque and commendation letter reporting: *Your commitment, responsibility, ethics, honesty, initiative, vocation and leadership, always accompanied by excellent human relations, which leave an indelible mark on our institution. Your contributions from different international fronts were essential to achieve the recognition that the Institute of Physics enjoys today as a leading academic dependency in the country. Receive our admiration and gratitude forever.*
2017: Highlight as a Physics Review Letters Editors' Suggestion for the article *"Redefining the axion window"* by L. Di Luzio, F. Mescia and E. Nardi [Phys. Rev. Lett. 118, 031801 (2017)]"Due to its particular importance, innovation, and broad appeal"
2018: Awarded a María de Maeztu grant for visiting scientists at the Institut de Ciències del Cosmo, Universitat de Barcelona during May 2018.

2018 Awarded a Simons Foundation grant for visiting scientist at the Aspen Center for Physics, CO (USA) as invited participant in the "Understanding the Origin of the Baryon Asymmetry of the Universe? workshop.

2019: Awarded a María de Maeztu grant for visiting scientists at the Institut de Ciències del Cosmo, Universitat de Barcelona during May 2019.

2019 Awarded a Simons Foundation grant for visiting scientist at the Aspen Center for Physics, CO (USA) as Leader of the Working Group "The landscape of axion models".

Grants & Research Projects

1998-2000: *"Study of rare B meson decays for testing the standard electroweak theory and constraining of new physics"*. Funding agency: Colciencias (CO) (50,000 eu. - 5 pers.)

1999-2001: *"Neutrino Oscillations in High Density Matter"*. Funding agency: Comité de Investigaciones, UdeA (CO) (10,000 eu. - 3 pers.)

2001-2002: *"Neutrino masses and mixings in supersymmetry without R-parity"*. Funding agency: : Comité de Investigaciones, UdeA (CO) (5,000 eu. - 3 pers.)

2004-2006: *"Computing Yukawa couplings in* $SU(5) \times U(1)$*"*. Funding agency: Comité de Investigaciones, UdeA (CO) (10,000 eu. - 3 pers.)

2004-2006: *"Searching for sub eV-scale neutrino masses using supernova neutrinos"*, Funding agency: Colciencias (CO) (30,000 eu. - 4 pers.)

2005-2006: *"Sostenibilidad"* - Project for strengthen and develop the *Grupo de Fenomenologia de las Interacciones Fundamentales (GFIF) - UdeA"*, Funding agency: Comité de Investigaciones, UdeA (CO) (30,000 eu. - 10 pers.)

2006-2007: *"Flavor Effects in Leptogenesis and Neutrino Physics"*. Funding agency: Colciencias (CO) (50,000 eu. - 10 pers.)

2002-present *INFN CSN4 Iniziativa Specifica on Astroparticle Physics:* TAsP. LNF local coordinator (non-competitive basis grant).

2010-2011: INFN-MICINN ACI2009-1038 grant for collaboration between LNF and the U. of Barcelona. Research Project: *"Low scale leptogenesis"* (8,000eu. - 4 pers.)

2014-2017: *PRIN-2012: Theoretical Astroparticle Physics*, local coordinator (for LNF and U. Rome 1 groups).

2018-2018: ICCUB-Maria de Maeztu Grant for for visiting scientists at ICCUB (2,500eu.)

2019-2019: ICCUB-Maria de Maeztu Grant for for visiting scientists at ICCUB (1,000eu.)

Recent talks and invitations

Recent invited talks/lectures at International Conferences/Workshops (triennium 2016-2020 only)

2020 Invited lecture *"Axions: an interface between particle physics and cosmology"* , Axion++ Workshop, LPSC Grenoble, May 5-7, 2020 (COVID-19 postponed)

2019 (Plenary) *"QCD Axions off the beaten tracks"*
15th PATRAS workshop on Axions, Wimps and Wisps, Freiburg (D) (*June 3-7, 2019*)

2018 (Plenary) *"Understanding the origin of the Baryon asymmetry of the Universe"*
Aspen Center for Physics, Aspen, CO (*August 26 - September 16, 2018)*

2017 (Plenary) *"New Directions in Dark Matter and Neutrino Physics"*
Perimeter Institute for Theoretical Physics, Waterloo, ON (CA)

2017 (Plenary) CERN-EPFL-Korea Theory Institute *"New Physics at the Intensity Frontier"* CERN, Geneva (CH)

2017 (Plenary) *"2nd ComHEP: Colombian Meeting on High Energy Physics"* UNAL, Bogota

2016 (Plenary) *"1st ComHEP: Colombian Meeting on High Energy Physics"* ITM, Medellin (CO)

2016 (Parallel) *"11th Latin American Symposium on High Energy Physics"* Antigua, (GT)

2016 (Parallel) *"TeV Partilce Astrophysics"* (TeVPA), CERN (CH)

2016 (Plenary) 2016 MIAPP programme *"Why is there more Matter than Antimatter in the Universe?"* Munich, (D)

2016 (Plenary) ERC-Grant workshop *"Towards the Construction of the Fundamental Theory of Flavour"* MIAPP, Munich (D)

2016 (Plenary) *"6th International Workshop on High Energy Physics in the LHC era"* Universidad Técnica Federico Santa Mara, Valparaiso (CL)

Recent invitations (2016-2020 only)

2020 CERN-TH short-term visitor, June 15 - July 4, 2020 (COVID-9 postponed)

2020 MIAPP Workshop *"Axion Cosmology"*, Munich, March 1-13

2019 Proposer and Working Group Leader *"Landscape of Axion models":* Aspen Center for Physics, (USA)

2019 Visiting scientists at the Institut de Ciències del Cosmo, Universitat de Barcelona

2018 Aspen Center for Physics, CO (USA)

2018 Visiting scientists at the Institut de Ciències del Cosmo, Universitat de Barcelona

2017 Visiting researcher, CERN Theory Group, Geneva (CH)

2017 Visiting scientist, Perimeter Institute for Theoretical Physics, Waterloo, ON (CA)

2017 Invited participant, CERN-EPFL-Korea Theory Institute, CERN, Geneva (CH)

2016 Munich Institute for Astro- and Particle Physics, MIAPP, Munich (D)

Coordinator of International Cooperation Agreements:

2001-2002 *Cooperation Agreement:* Physics Institute, Antioquia U. (CO) & International Center for Relativistic Astrophysics (ICRA) (Rome - Italy)

2001-2002 *Cooperation Agreement:* Physics Institute, Antioquia U. (CO) & University of Valencia (Spain) (2001-02). Funding Agencies: COLCIENCIAS (Colombia) & CSIC (Spain).

2002-2007: *Federation Arrangement:* Abdus Salam International Centre for Theoretical Physics (Trieste - Italy) & Physics Institute, Antioquia U. (CO)

Organization of Scientific Events

Proposer/Chair of Conferences, Workshops and Schools

2021 Proposer/Contact person: ACP Summer Workshop *"Axions Beyond Boundaries between Particle Physics, Astrophysics, Cosmology and forefront Detection Technologies"*. Aspen Center for Physics, (USA). Selected in Phase 1, under evaluation in Phase 2.

2019 Proposer and co-chair of the *Rome Physics Encounters LNF*
`https://agenda.infn.it/category/1150/`

2019: Proposer and Co-Chair of the LNF Autumn Institute on *"Directional Sub-GeV Dark Matter Detection"*
https://agenda.infn.it/conferenceDisplay.py?confId=19972

2019: ACP Working Group Leader: *"The landscape of QCD axion models"*
Aspen Institute of Physics, Aspen (CO-USA) 14-28 July 2019.

2019: Chair: LNF Summer Institute on *"Flavour anomalies in B decays, light dark matter from hidden sectors and lepton dipole moments"*
https://agenda.infn.it/conferenceDisplay.py?confId=19324

2019: Chair: LNF Spring Institute on *" The importance of being light: Axions, Nambu-Goldstone Bosons, and Vector Bosons in the Dark"*
https://agenda.infn.it/conferenceDisplay.py?confId=19200

2019: Chair: LNF Winter Institute on *"Axions in Astrophysics and Cosmology"*
https://agenda.infn.it/conferenceDisplay.py?confId=17880

2018: Chair: LNF Summer Institute on *"Flavor Physics, axion phenomenology and dark sectors"*
https://agenda.infn.it/conferenceDisplay.py?confId=15950

2017: Chair: 6th Rome Joint Workshop *"Weird Theoretical Ideas"*
https://agenda.infn.it/conferenceDisplay.py?confId=14269

2017: Chair: 5th Rome Joint Workshop *"Hot QCD Matters"*
https://agenda.infn.it/conferenceDisplay.py?confId=13016

2016: Chair: 4th Rome Joint Workshop *"Selected puzzles in Particle Physics"*
https://agenda.infn.it/conferenceDisplay.py?confId=12099

2016: Director: *XVIII Frascati Spring School "Bruno Touscheck" & 5th Young Researcher Workshop* http://www.lnf.infn.it/conference/lnfss/16/index.php

2015: Chair: 3rd Rome Joint Workshop *"Challenges in the Dark Sector: Alternatives to the WIMP paradigm"* https://agenda.infn.it/conferenceDisplay.py?confId=10217

2015: Chair: 2nd Rome Joint Workshop *"Top mass: challenges in definition and determination"*
https://agenda.infn.it/conferenceDisplay.py?confId=9202

2014: Chair: 1st Rome Joint Workshop *"Rethinking Naturalness"* ,
https://agenda.infn.it/conferenceDisplay.py?confId=8527

2014: Director: *XVII Frascati Spring School "Bruno Touscheck" & 4th Young Researcher Workshop,* http://www.lnf.infn.it/conference/lnfss/14/index.php

2012: Director: *XVI Frascati Spring School "Bruno Touscheck" & 3rd Young Researcher Workshop,* http://www.lnf.infn.it/conference/lnfss/12/index.php

2010: Director: *XV Frascati Spring School "Bruno Touscheck" & 2nd Young Researcher Workshop,* http://www.lnf.infn.it/conference/lnfss/10/index.php

2010: Organizer: Course on *Space-time metrics, Cosmology, Inflation and Dark Matter*, LNF

2009: Co-chair of the Local Organization Committee:
CERN School: 5th Latin American School of High-Energy Physics, Antioquia (CO)
http://physicschool.web.cern.ch/PhysicSchool/LatAmSchool/2009/

2009: Director: *XIV Frascati Spring School "Bruno Touscheck" & 1st Young Researcher Workshop,* http://www.lnf.infn.it/conference/lnfss/09/index.php

2007: Co-Chair: *International Meeting on Lepton Properties and the Cosmological Origin of Matter*, Antioquia, (CO) http://csi.uan.edu.co/imlpcom07/index.htm

2003: Chair of the session: *Neutrino Physics, Astrophysics and Cosmology*, 10th Marcel Grossmann Meeting on General Relativity, Rio de Janeiro (BR)

2000: Chair: *III Latin American Symposium on High Energy Physics*, (SILAFAE-III), Cartagena de Indias, (CO)

1997: Director: *XII Colombian School in Theoretical Physics*, San Andres Islas, (CO)

Member of Organizing & Scientific Committees of Workshops, Conferences and Schools

2019: Convenor of the *"Ultralight Dark Matter"* session at the *"Light Dark Matter at Accelerators (LDMA)"* conference, Venice, November 20-22, 2019

2018: Member of the Organizing Committee: *XIX Frascati Spring School "Bruno Touscheck" & 6th Young Researcher Workshop*

2002-08: Member of the Organizing Committee:
LNF Spring School in Nuclear, Subnuclear and Astroparticle Physics "Bruno Touscheck", INFN - Laboratori Nazionali di Frascati. (Years 2002/03/04/05/06/07/08).

2006-09: Member of the Organizing Committee: *LNF Spring Institute* (Years 2006/07/08/09).

2002 - : Member of the Scientific Committee: *Latin American Symposium on High Energy Physics*, (SILAFAE) (2002 - present).

1994: Member of the Organizing Committee: *International Workshop on Supersymmetry and Unification of Fundamental Interactions SUSY-94*, U. of Michigan, Ann Arbor, (USA)

Scientific Reviewer:

Projects and research proposals reviewer: French National Research Agency (ANR) (France); FONDECYT (Chile); National Science Centre (Poland); Comité para el Desarrollo de la Investigación (Antioquia U., Colombia); Erwin Schrödinger International Institute for Mathematics and Physics (U. of Vienna, Austria).

Referee of Scientific Journals:

- Physical Review Letters
- Physical Review D
- Nuclear Physics B
- Physics Letters B
- JHEP (Journal of High Energy Physics)
- JCAP (Journal of Cosmology and Astroparticle Physics)
- Journal of Physics G
- New Journal of Physics
- Europhysics Letters
- European Physical Journal C

Thesis Supervision and Teaching

Career supervision (abridged)

- 5 Ph. D. students (*all presently holding academic positions*)
- 5 M. Sc. students, 2 B. Sc. (*all presently holding academic positions*)
- 11 Postdoctoral fellows [D. Aristizabal (CO), E. Peinado (MX), C.S. Fong (MY), A. Meroni (IT), S. Boucenna (DZ), M. Krauss (DE), F. Bjorkeroth (SE), J.L. Darmé (FR), Giovanni Grilli di Cortona (IT), Luca Visinelli (IT), Alexis Plascencia(MX)]

Ph. D., M. Sc. & B. Sc. thesis (detailed):

- **Ph. D.**: Dafne Guetta, (**presently:** Researcher, Osservatorio Astr. Roma), Topic: *B Physics in SUSY without R-parity.* Bologna U., (February 1999).
- **Ph. D.**: Jesus M. Mira (**presently:** Associate Professor, Antioquia U., CO), Topic: *B Physics in SUSY without R-parity.* Antioquia U. (December 2000).
- **M. Sc.**: Jorge I. Zuluaga (**presently:** Associate Professor, Antioquia U., CO), Topic: *Pulsar Kicks.* Antioquia U. (February 2001).
- **M. Sc.**: Diego Aristizabal (**presently:** Associate Professor, U. Técnica Federico Santa María, Valparaíso, CL), Topic: *Flavor Symmetries.* (January 2004).
- **Ph.D.**: Jorge I. Zuluaga (**presently:** Associate Professor, Antioquia U., CO), Topic: *Supernova neutrino signals.* Antioquia U. (January 2005).
- **B. Sc.**: Jorge Noreña (**presently:** Associate Professor, Pontificia U. Católica de Valparaíso, CL), Topic: *Leptogenesis.* Antioquia U. (June 2006).
- **M. Sc.**: Luis F. Duque (**presently:** Professor, ITM - Medellín), Topic: *Flavor Symmetries in GUT Models.* Antioquia U. (February 2007).
- **B. Sc.**: Carolina Arbelaez (**presently:** Postdoc, U. Técnica Federico Santa María, Valparaíso, CL), Topic: *Flavor Symmetries for ν masses.* (December 2010).
- **Ph. D.**: Luis A. Muñoz, (**presently:** Professor, ITM - Medellín), Topic: *Selected Issues in Leptogenesis.* Antioquia U. (April 2010).
- **M. Sc.** - César Arias, (**presently:** Assistant Professor, ITM - Medellín) Topic: *Flavour in Leptogenesis.* Antioquia U. (June 2011).
- **Ph. D.**: Cristian D. Ruiz Carvajal, (**presently:** Contract Professor, UdeA, Medellín) Topic: *Phenomenology of axion dark matter.* Antioquia U. (February 2019).
- **M. Sc.** - Clemente Smarra, (**presently:** Ph.D. Studente, SISSA-ISAS - Trieste) Topic: *The Axion Flavour Connection.* Sapienza U. (Rome) (September 2021).

Didactics and teaching (abridged)

- 3 graduate and 12 postgraduate courses: Subatomic Physics, Electromagnetism, Advanced topics in the Standard Model, Physics beyond the Standard Model, Quantum Field Theory, Supersymmetry, Astroparticle physics, Physics of the early universe, at U. Antioquia (CO) and U. Autonoma Madrid (ES).
- 4 invited short courses in Univerisities and Schools on physics of the early universe: U. of Southern Denmark (DK), U. Barcelona (ES), U. San Carlos (GT), Astro-scuola 2001, Otranto (I) .

Teaching: courses in Undergraduate, M. Sc., Ph. D. programs and Physics Schools (detailed)

- *Three lectures on the physics of the Early Universe*
  9th Odense Winter School on Theoretical Physics - CP3-Origins University of Southern Denmark - Odense (DK) - February 6-10, 2017.
- *Standard Model II.* (M. Sc.). 2° semesters 2010 and 2011, Physics Department, Madrid Autonoma University Madrid, (Spain).
- *Four lectures on the Early Universe: 1. Boltzmann Equations, 2. Recombination, 3. Nucleosynthesis, 4. Freeze-out of WIMP Dark Matter.* (M. Sc. & Ph. D.)
  Barcelona University - June 14-18, 2010.
- *Introduction to Quantum Field Theory.* (M. Sc.)
  University San Carlos de Guatemala - February 5-9, 2007.
- *Neutrinos in Physics and Astrophysics* . (Graduate Level).
  1 semester, Ph. D. program, U. Antioquia (Medellín - CO)
- *Introduction to the Standard Model.* (Undergraduate Level).
  2 semesters, U. Antioquia (Medellín - CO)
- *Advanced topics in the Standard Model.* (Graduate Level).
  1 semester, Ph. D. program, U. Antioquia (Medellín - CO)
- *Supersymmetry.* (Graduate Level).
  3 semesters, Ph. D. program, U. Antioquia (Medellín - CO)
- *Introduction to Subatomic Physics.* (Undergraduate Level).
  2 semesters, U. Antioquia (Medellín - Colombia)
- *Selected topics in Physics of the Early Universe.* (Graduate & Undergraduate Level).
  1 semester, U. Antioquia (Medellín - Colombia)
- *Electromagnetism I.* (Undergraduate level).
  3 semesters, U. Antioquia (Medellín - CO)
- *Introduction to Quantum Field Theory* (Graduate Level).
  3 semesters, Ph. D. program, U. Antioquia (Medellín - CO)
- *Neutrinos and Supernovae.* Lectures at "AstroScuola 2001 - Prima Scuola Nazionale in Fisica delle Astroparticelle" Conca Specchiulla (Otranto, Lecce) 11 - 16 June 2001.
- *From Quarks to Cosmos.* Lectures at *Incontri di Fisica dell' INFN* Frascati (Roma) 5 -7 Settembre 2001.

Outreach ("Terza Missione"):

2017 Collaboration to "LNF Highlights 2016" publication with the divulgative article "Where should we search to find the Axion?"
http://library.lnf.infn.it/wp-content/uploads/2017/09/Highlights2016.pdf

2016 Outreach Conference, ITM, Medellín, Colombia,
"Las constantes fundamentales de la naturaleza y la física moderna".

2016 Two talks at the 12th IPPOG International Masterclass 2016 at LNF
"Le costanti fondamentali della natura e la fisica moderna",
"Introduzione al Modello Standard".

2015 Talk at the 11th IPPOG International Masterclass 2015 at LNF
"Le costanti fondamentali della natura e la fisica moderna".

2013 Outreach Conference, Parque Explora, Medellín, Colombia,
"Las constantes fundamentales de la naturaleza y la física moderna".

2012 Conference for Scientific High Schools, Liceo Scientifico G. Marinelli, Udine
"Le costanti fondamentali della natura e la fisica moderna".

2007 Outreach conference, *Instituto Italiano de Cultura*, Ambasciata d' Italia, Ciudad de Guatemala: "De los quarks al Cosmo".

2006– Scientific Collaborator for the INFN outreach project "ScienzaPerTutti".

2002 Outreach conference, Instituto di Fisica, Univ. de Antioquia, Medellín, Colombia, "From quarks to Cosmos". July 29th, 2002.

2001 Outreach conference: *Corso di fisica per insegnanti di scuola media superiore,* Laboratori Nazionali di Frascati, "Dai quarks al Cosmo".

Resumed List of Research Topics

- LEP Physics. Radiative Corrections in $SU(2) \times U(1)$. Top-quark mass loop effects.
- Global fits to high precision measurements and limits on new physics parameters
- GUT models. Non-conventional E_6 models.
- B-physics. Study of rare decays. New physics effects in B-decays. Excess of b-quarks production at LEP: analysis and models.
- SUSY without R-parity. Neutrino masses from broken R-parity. Models for R-parity as an accidental symmetry.
- Flavor Symmetries: models for charged and neutral fermion masses.
- Neutrino physics: electromagnetic form factors. Neutrino propagation in matter.
- Physics of Supernovæ and Pulsars. Models to explain *Pulsar Kicks*. Limits on neutrino masses from precise measurements of a Galactic supernova neutrino signal.
- Leptogenesis: Spectator processes; Flavor effects; CP asymmetries in scatterings. Low scale leptogenesis.
- Non-Abelian and Abelian flavor symmetries for neutrino masses. Related effects in leptogenesis.
- Dark Matter (DM). Non-conventional candidates. Asymmetric DM. DM decays and related signals (anomalies) in cosmic rays fluxes. DM from GUTs.
- Spontaneous breaking of the $SU(3)^5$ flavour symmetry. Effective potential and phenomenological models.
- Axion physics.
- Phenomenology of dark photons and dark sectors.

Specific skills in leadership

- Experience in starting and developing research groups.
- Experience in leading research projects.
- Experience in preparing/submitting research proposals.
- Experience in the organization of scientific events.

Curriculum vitae

FRANCESCO TRAMONTANO
Professor of Theoretical Physics
Dept. Physics, Università di Napoli Federico II (UNINA), *Napoli, Italy*
ORCID: 0000-0002-3629-7964
Reseacher ID: L-9415-2015 (http://www.researcherid.com/rid/L-9415-2015)
Google Scholar ID: https://scholar.google.it/citations?user=OWmPfGYAAAAJ&hl=it&oi=ao
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PERSONAL INFORMATIONS:
Full name: Francesco Tramontano
Nationality: Italy
Date of birth: 9th September 1973

EDUCATION:

2001	Research Doctorate (PhD), Physics, UNINA, Italy
1997	Laurea (Master's degree), Physics, UNINA, Italy

EMPLOYMENT HISTORY:

2018 – curr.	Associate Professor of Theoretical Physics, Dept. Physics, UNINA, Italy
2012 – 2018	Researcher of Theoretical Physics, Dept. Physics, UNINA, Italy
2015 – 2016	Visiting Scientist (November-February, 3 months), CERN, Switzerland.

FELLOWSHIPS:

2011 – 2012	Marie Curie Intra European Fellow, project title SAMURAI-APPS, CERN, Switzerland
2009 – 2011	CERN Fellow of the Theory Group, CERN, Switzerland
2003 – 2009	Post Doctoral Fellow at UNINA and Istituto Nazionale di Fisica Nucleare
2003	Fellow of the "Angelo Della Riccia" Foundation, spent at CERN, Switzerland
2002	Researcher under contract, Experimental Group on Neutrino Physics, UNINA, Italy.

MANAGEMENT OR PARTICIPATION IN INTERNATIONAL RESEARCH GROUPS:

2020 - curr.	Coordinates the theoretical studies related to the neutrino physics section of the SND@LHC experiment (Scattering and Neutrino Detector)
2014 - 2019	Coordinator of the subgroup of the Higgs Cross Section Working Group which deals with the associated production channel of an Higgs and a vector boson at the LHC
2014 - curr.	Coordinates the theoretical studies related to the neutrino physics section of the SHiP experiment proposal (Search for Hidden Particles)
2013 - curr.	Theory consultant for the CMS collaboration the physics of the top quark

SUPERVISION OF STUDENTS AND POSTDOCTORAL FELLOWS:

2012 - curr.	2 PostDocs (Anurag Tripathi, now staff at the IIT, Hyderabad), 1 current
	2 PhD student at UNINA (1 in cotutele with the University of Zurich, Switzerland)
	5 Master students, 1 current
	2 Bachelor students

TEACHING ACTIVITIES:

2018	Course of "Introduction to Quantum Chromodynamics" at the joint CERN and JINR

"European School of High Energy Physics"

2017 - curr. Introduction to Quantum Chromodynamics, PhD program in Physics

2017 - curr. Numerical methods in Physics, and Applied Perturbative QCD, Laurea Magistrale (MSc) in Physics

2014 - curr. General Physics, Diploma (BSc) in Computer Science, Biology and Biotech. Science

ORGANIZATION OF SCIENTIFIC MEETINGS (selected - more recent):

2021,19,17,15 Convener of the international conference "Linear and Future Colliders", Trento, Italy

2018 Convener of the international conference "LHC Physics 2018", Bologna, Italy

2018 Convener of the international conference "QCD@LHC 2018", Debrecen, Hungary

2017 Scientific Advisory Board of the CERN-EPFL-Korea Theory Institute: "New Physics at the Intensity Frontier", CERN, Switzerland

2015 Member of the local organizing committee for the international conference: "8th International Workshop on Top Quark Physics", Ischia island, Italy

INSTITUTIONAL RESPONSIBILITIES:

2019 Recruitment com. for the PhD program at UNINA

2019 Recruitment com. for a tenure track position in Theoretical Physics at the University of Bologna, Italy

2018 - curr. Recruitment com. for PostDoc positions in Theoretical Physics at UNINA and INFN

EDITORIAL AND SCIENTIFIC CONSULTING ACTIVITIES:

2014 - curr. Reviewer for scientific journals (including EPJC, JHEP, PLB, PRD, PRL)

2015 - curr. Reviewer for the national funding agency: Netherlands Organization for Scientific Research, Netherlands

2015 - curr. Reviewer of PhD thesis at UNINA, the University of Pavia (Italy), the University of Leiden (Netherlands)

2015 - 2016 Editor of the Proceedings of the 8th International Workshop on Top Quark Physics, PoS TOP2015 (2015)

MEMBERSHIPS OF SCIENTIFIC SOCIETIES:

2019 - curr. Member of the Italian Physical Society, Italy

2016 - curr. Research Assignment by Istituto Nazionale di Fisica Nucleare, Italy

2009 - curr. CERN Associated Member, CERN, Switzerland

PUBLICATION AND CITATION TOTAL NUMBERS:

- 56 publications in scientific journals (1 in Report on Progress in Physics and 8 in PRL)
- Co-author of 6 CERN Yellow Reports
- Citations to the 56 publications are 4997 in inspirehep (3976 without self citations).

NAPOLI, 18 OTTOBRE 2021

Francesco Tramontano