CURRICULUM VITÆ

GIANCARLO FERRERA

Address

Dip. di Fisica, Università di Milano
Via G. Celoria 16, I-20133 Milano, Italy
Phone: (+39)0250317426
E-mail: giancarlo.ferrera@mi.infn.it
Web-site: http://pcteserver.mi.infn.it/∼ferrera/
ORCID 0000-0002-4559-0740; Inspire ID INSPIRE-00176935; Scopus A. ID 14057930700.

Current and Previous Positions and Fellowships

2018-now Associate Professor (permanent) at Physics Department, Milan University.

2015-now INFN Scientific Research Appointment.

2014-now Visiting Scientist at CERN.

2013 & 2017 Italian Professorship Qualification as Associate (2013) and Full (2017) Professor in the field "Theoretical Physics of Fundamental Interactions".

2011-2017 Assistant Professor (permanent) at Physics Department, Milan University.

2011 Academic Visitor, Physics Department, Zurich University.

2007-2011 Postdoc position, Physics Department, Florence University.

2007 Research Training grant (High Energy Physics LatinAmerican-European Network), Buenos Aires University. Supervisor: Prof. D. de Florian.

2006-2007 Postdoc position at Department E.C.M., Barcelona University. Early Stage Researcher (Marie Curie RTN HEPTOOLS). Supervisors: Prof. F. del Águila, Prof. J. Solà (7 months).

Education

2004-2006 Ph.D. in Physics, Rome University "La Sapienza". Thesis Title: *Threshold resummation in heavy flavour physics*; Supervisor: Dr. U. Aglietti. Graduation: 23/01/2007.

2001-2002 Master in Theoretical Physics, Rome University "La Sapienza" ; Thesis Title: *Associated production of Higgs bosons and charginos in the MSSM at linear colliders;* Supervisors: Prof. G. Martinelli and Dr. B. Mele. Graduation: 25/09/2003. Degree: 110/110 cum laude.

1999-2000 Master studies of Physics at "Scuola Normale Superiore" Pisa and Pisa University.

Supervision of postdoctoral fellows, graduate and PhD student

2012-now Supervisor of 3 postdoc researchers: M.Villaplana, G.Sborlini, N.Rana, Milan U. and INFN.

2012-now Co-supervisor of 1 PhD student and referee of 4 PhD thesis in Physics.

2012-now Supervisor of 12 BSc and 4 Master thesis students in Physics, Milan University.

Organization of research meetings and research responsabilities

2019-now Group convener of *VH* subgroup of the CERN "LHC Higgs Cross Section Working Group" and

2012-2014 of the "Handbook of LHC Higgs Cross Sections: Higgs properties".

2019 Member of local organizing committee of the Workshop: "Workshop on Photon Physics and Simulation at Hadron Colliders", INFN-LNF, Frascati (Rome), Italy, June 2019

2015-2019 Organizer and Convener of the "QCD session" of the workshop "Linear and Future Colliders", ECT* Trento, Italy, September 2015/2017/2019.

2010 Member of local organizing committee of the Workshop: "HP2.3rd - High Precision for Hard Processes at the LHC", Florence U., Italy, September 2010

2013-2017 Person in charge for the Theoretical Physics Seminars of the Phys. Dept., Milan U.

Academic teaching and responsabilities

Since 2012 around half of my activity has been devoted to academic teaching and other institutional duties (see below).

2012-now Classes of "Quantum Mechanics" (∼500h) and "Fundamental Interactions" (∼100h), Examination committee "Theoretical Physics" (∼100 oral exams)

2015-now Lectures "Introduction of perturbative QCD" (20h), PhD School, Milan U. (2015, 2016 and 2017). Lectures to graduate and PhD students "NNLO QCD calculations in hadronic collisions" (12h), Saha Theory Workshop: Multi-loop and Multi-leg processes for precision physics at the LHC, Kolkata (2016)

2004-2007 Exercise Classes of "Quantum Mechanics" (30h) and "Mathematical Analysis" (120h)

2012-now Committe member of: Bsc/Master theses (∼30 times), postdoc/teaching fellowship (10 times), Milan U. PhD School selection (3 times).

2012-now Member of the Faculty Committee and person in charge for the Courses of the Theoretical Physics Area of the *Physics, Astrophysics and Applied Physics PhD School* of the Milan U.

Programming skills

Author and co-author of various numerical codes intensively used by the LHC experimental collaborations: `DYNNLO`, `2γNNLO`, `HVNNLO`, `HqT`, `DYqT`, `HRes`, `DYres`.

Participation in funded Network and Research Project

EU Research Projects:

2014-2018: ITN - *The Higgs quest - exploring electroweak symmetry breaking at the LHC (HIGGSTOOLS)*; 3 738 154 € (amount), 4 years (period), project participant (role).
2014-2018: ITN - *Advanced Particle Phenomenology in the LHC era (LHCPHENONET)*; 4 491 085 € (amount), 4 years (period), project participant (role).

Italian Ministry of University and Research Research (MIUR) Projects:

2013-2016: *Symmetries, Masses and Mysteries: Electroweak symmetry breaking, flavour mixing and CP violation and Dark Matter in the LHC era*; 920 500 € (amount), 3 years (period), project participant (role).
2009-2011: *Theory of fundamental interactions in the LHC era: precision calculations and new physics.*; 173 793 € (amount), 2 years (period), project participant (role).

2007-2009: *Beyond the Standard Model Physics in the LHC era*; 169 500 € (amount), 2 years (period), project participant (role).

Italian Ministry of Foreign Affairs and International Cooperation (MAECI) Projects:

2017-2019: *Joint research project for indo-italian scientific cooperation*, project participant (role).

INFN Research Projects:

2004-2011: *Field Theory of Fundamental Interactions*, project participant (role).
2011-2016: *Weak and Strong Interactions Phenomenology*, project participant (role).
2017-2019: *Phenomenology of Weak and Strong Interactions*, project participant (role).

All ongoing grants and funding of the PI (Funding ID)

Project Title	*Funding source*	*Amount (Euro)*	*Period*	*Role of the PI*
Proton strucure for discovery at the Large Hadron Collider	ERC	1 602 862	2017-2022 (5 years)	Project participant
Phenomenology of Weak and Strong Interactions (SPIF)	INFN	∼ 80 000	2017-2019 (3 years)	Project participant
Joint research project of scientific cooperation	MAECI	∼ 20 000	2017-2019 (3 years)	Project participant

Other funded grants as PI

Project Title	*Funding source*	*Amount (Euro)*	*Period*	*Role of the PI*
Transition Grant (for reaching II step in ERC-StG)	Milan University	80 000	2017-2019 (2 years)	Project PI
Towards a competitive ERC project in High-Energy Physics	Cariplo Foundation & Regione Lombardia	131 368	2015-2017 (2 years)	Project PI
GPU computing in Theoretical Physics	Milan University	∼ 35 000	2014-2018 (5 years)	Project PI

Publications

Representative publications

[1] S. Catani, L. Cieri, G. Ferrera, D. de Florian and M. Grazzini, *"Vector boson production at hadron colliders: a fully exclusive QCD calculation at NNLO"*, Phys. Rev. Lett. **103** (2009) 082001.

[2] D. de Florian, G. Ferrera, M. Grazzini and D. Tommasini, *"Transverse-momentum resummation: Higgs boson production at the Tevatron and the LHC"*, JHEP **1111** (2011) 064.

[3] G. Ferrera, M. Grazzini and F. Tramontano, *"Associated WH production at hadron colliders: a fully exclusive QCD calculation at NNLO"*, Phys. Rev. Lett. **107** (2011) 152003.

[4] G. Bozzi, S. Catani, G. Ferrera, D. de Florian and M. Grazzini, *"Production of Drell–Yan lepton pairs in hadron collisions: transverse-momentum resummation at next-to-next-to-leading logarithmic accuracy"*, Phys. Lett. **B696** (2011) 207.

[5] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, *"Diphoton production at hadron colliders: a fully-differential QCD calculation at NNLO"*, Phys. Rev. Lett. **108** (2012) 072001.

[6] D. de Florian, G. Ferrera, M. Grazzini and D. Tommasini, *"Higgs boson production at the LHC: transverse momentum resummation effects in the $H \to 2\gamma$, $H \to WW \to l\nu l\nu$ and $H \to ZZ \to 4l$ decay modes"*, JHEP **1206** (2012) 132.

[7] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, *"Universality of transverse-momentum resummation and hard factors at the NNLO"*, Nucl. Phys. B **881** (2014) 414.

[8] G. Ferrera, G. Somogyi and F. Tramontano, *"Associated production of a Higgs boson decaying into bottom quarks at the LHC in full NNLO QCD,"* Phys. Lett. B **780** (2018) 346.

[9] G. Ferrera and J. Pires, *"Transverse-momentum resummation for Higgs boson pair production at the LHC with top-quark mass effects,"* JHEP **1702** (2017) 139.

[10] L. Cieri, G. Ferrera and G. F. R. Sborlini, *"Combining QED and QCD transverse-momentum resummation for Z boson production at hadron colliders,"* JHEP **1808** (2018) 165.

Other publications on peer-reviewed Journal Papers

[11] A. Abada *et al.* [FCC Collaboration], Eur. Phys. J. ST **228** (2019) no.2, 261.

[12] A. Abada *et al.* [FCC Collaboration], Eur. Phys. J. ST **228** (2019) no.4, 755.

[13] A. Abada *et al.* [FCC Collaboration], Eur. Phys. J. ST **228** (2019) no.5, 1109.

[14] A. Abada *et al.* [FCC Collaboration], Eur. Phys. J. C **79** (2019) no.6, 474.

[15] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, JHEP **1804** (2018) 142

[16] S. Alioli *et al.*, Eur. Phys. J. C **77** (2017) no.5, 280

[17] S. Catani, D. de Florian, G. Ferrera and M. Grazzini, JHEP **1512** (2015) 047.

[18] R. Angeles-Martinez *et al.*, Acta Phys. Polon. B **46** (2015) no.12, 2501

[19] S. Forte *et al.*, Eur. Phys. J. C **75** (2015) no.11, 554

[20] G. Ferrera, M. Grazzini and F. Tramontano, Phys. Lett. B **740** (2015) 51

[21] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, Nucl. Phys. B **888** (2014) 75

[22] G. Ferrera, M. Grazzini and F. Tramontano, JHEP **1404** (2014) 039.

[23] S. Catani, L. Cieri, D. de Florian, G. Ferrera and M. Grazzini, Eur. Phys. J. C **72** (2012) 1.

[24] S. Catani, G. Ferrera and M. Grazzini, JHEP **1005** (2010) 006

[25] G. Bozzi, S. Catani, D. de Florian, G. Ferrera, M. Grazzini Nucl. Phys. B **815** (2009) 174.

[26] U. Aglietti, L. Di Giustino, G. Ferrera and L. Trentadue, Phys. Lett. B **670** (2009) 367

[27] U. Aglietti, F. Di Lodovico, G. Ferrera and G. Ricciardi, Eur. Phys. J. C **59** (2009) 831

[28] G. Ferrera, J. Guasch, D. Lopez-Val and J. Sola, Phys. Lett. B **659** (2008) 297

[29] G. Ferrera, Nuovo Cim. B **123** (2008) 766.

[30] G. Corcella and G. Ferrera, JHEP **0712** (2007) 029.

[31] U. Aglietti, G. Ferrera and G. Ricciardi, Nucl. Phys. B **768** (2007) 85.

[32] U. Aglietti, G. Corcella and G. Ferrera, Nucl. Phys. B **775** (2007) 162.

[33] U. Aglietti, L. Di Giustino, G. Ferrera, and L. Trentadue, Phys. Lett. B **651** (2007) 275

[34] U. Aglietti, L. Di Giustino, G. Ferrera, A. Renzaglia, G. Ricciardi and L. Trentadue, Phys. Lett. B **653** (2007) 38

[35] U. Aglietti, G. Ricciardi and G. Ferrera, Phys. Rev. D **74** (2006) 034006.

[36] U. Aglietti, G. Ricciardi and G. Ferrera, Phys. Rev. D **74** (2006) 034005.

[37] U. Aglietti, G. Ricciardi and G. Ferrera, Phys. Rev. D **74** (2006) 034004.

[38] G. Ferrera and B. Mele, Eur. Phys. J. C **42** (2005) 425.

Other publications

[39] P. Azzi *et al.* [HL-LHC Collaboration and HE-LHC Working Group], arXiv:1902.04070 [hep-ph].

[40] M. L. Mangano *et al.*, *"Physics at a 100 TeV pp Collider: Standard Model Processes,"* CERN Yellow Report (2017) no.3, 1

[41] A. Andreazza *et al.*, *"What Next: White Paper of the INFN-CSN1,"* Frascati Phys. Ser. **60** (2015) 1.

[42] D. de Florian *et al. "Handbook of LHC Higgs Cross Sections: 4. Deciphering the Nature of the Higgs Sector,"*

[43] G. Ferrera, "Standard Model physics at the LHC," Nuovo Cim. C **38** (2015) no.1, 9.

[44] G. Ferrera and L. Trentadue *"Perturbative QCD at the LHC"*, Nuovo Cim. C **37** (2014) 83.

[45] S. Heinemeyer *et al. "Handbook of LHC Higgs Cross Sections: 3. Higgs Properties".*

[46] S. Dittmaier, *et al.*, *"Handbook of LHC Higgs Cross Sections: 2. Differential Distributions".*

[47] J. M. Campbell *et al.*, *"Report of the Snowmass 2013 energy frontier QCD working group".*

Talks and presentations

Selected invited presentations to international conferences and workshops (among more than 60 seminars)

[1] *Precise perturbative QCD predictions for the LHC: higher-order calculations and all-order Sudakov resummation*, 48th International Symposium on Multiparticle Dynamics Singapore, 2018.

[2] *Future Hadron Collider Theory*, 6th Annual LHC Physics Conference (LHCP2018), Shangai, China, 2018.

[3] *Transverse-momentum resummation for vector boson production* ATLAS Standard Model Workshop, Thessaloniki, Greece, 2017.

[4] *NNLO QCD predictions and transverse-momentum resummation for vector boson production* (LHCP2017), 4th Annual LHC Physics Conference, Shangai, China, 2017.

[5] *Vector boson production at the LHC: transverse-momentum resummation and leptonic decay*, 3th Annual LHC Physics Conference (LHCP2015), St. Petersburg, Russia, 2015.

[6] *Diphoton production at hadron colliders in NNLO QCD,* "Loops and Legs in Quantum Field Theory" 11th DESY Workshop on Elementary Particle Physics, Wernigerode, Germany, 2012.

[7] *Higher-order QCD effects for associated VH production and decay at the LHC,* "XLVIIth Recontres de Moriond" QCD and High Energy Interaction, La Thuile, Italy, 2012.

[8] *VH Cross Section Working Group: Theory status and plans,* "VII LHC Higgs Cross Section Workshop", CERN, Switzerland, 2012.

[9] *Lepton Charge Asymmetry from W decays at hadron colliders in NNLO QCD,* "XLIVth Recontres de Moriond" La Thuile, Italy, 2010.

[10] *NNLO QCD corrections to lepton charge asymmetry in W decays at hadron colliders*, XVIII Int. Workshop on DIS and Related Subjects, Florence, Italy, 2010.

[11] *Fully differential NNLO QCD calculations for WH production at hadron colliders,* 11th Int. Symp. on Radiative Corrections, Mamallapuram, India, 2009.

[12] *Higher-order QCD corrections to vector boson production at hadron colliders,* Europhysics Conf. on High Energy Physics, Krackow, Poland, 2009.

[13] *NNLO QCD correction to vector boson production at hadron colliders*, 9th International Symposium on Radiative Corrections, Ascona, Switzerland, 2009.

[14] *Higher-order QCD corrections for vector boson production at hadron colliders*, "XLIIIth Recontres de Moriond" La Thuile, Italy, 2009.

[15] *Triple Higgs boson production at the ILC within a generic Two-Higgs-Doublet Model*, 8th Intern. Symposium on Radiative Corrections, Florence, Italy, 2007.

October 2019