

Federico Zerbini

Personal Information

Birth July 9th, 1989 in Milan, Italy
Nationality Italian

Employment

- 12/22-now **Beatriz Galindo tenure track**, *UNED, Departamento de Matematicas (Madrid, Spain)*
09/22-11/23 **Postdoctoral fellow**, *Mathematical Institute, University of Oxford (UK)*
10/22-09/23 **Stipendiary Lecturer**, *St. Peter's College, University of Oxford (UK)*
09/20-08/22 **Marie Skłodowska-Curie Postdoctoral Fellow**, *Institut de Physique Théorique (IPhT), CEA-Saclay (Paris, France)*
10/'19-08/'20 **LabEx IRMIA Postdoctoral Fellow**, *Institut de Recherche Mathématique Avancée (IRMA) at Strasbourg University (France)*
11/17-09/19 **LabEx Hadamard Postdoctoral Fellow in “Mathematics and Physics”**, *Institut de Physique Théorique (IPhT), CEA-Saclay (Paris, France)*

Education

- 10/2017 **Ph.D. in mathematics**, *Bonn University (Germany)*, thesis: “Elliptic multiple zeta values, modular graph functions and genus 1 superstring scattering amplitudes”, supervised by Prof. Don Zagier (Max Planck Institute for Mathematics)
07/2013 **M.Sc. in mathematics**, *Double-degree master ALGANT (ALgebra, Geometry And Number Theory), Bordeaux 1 University (France) and Milan University (Italy)*, thesis: “The dominant root assumption in problems with linear recurrences”, supervised by Prof. Yuri Bilu
07/2011 **B.Sc. in mathematics**, *Milan University (Italy)*, thesis: “On the irrationality of the function zeta at the odd integers”, supervised by Prof. Giuseppe Molteni

Articles

Published

- 12/2022 **Single-valued hyperlogarithms, correlation functions and closed string amplitudes**, *joint with P. Vanhove*, *Adv. Theor. Math. Phys.* Vol. 26 no. 2 (2022), arXiv:1812.03018
02/2022 **Building blocks of closed and open string amplitudes**, *joint with P. Vanhove*, *PoS* Vol. 383 (2022) MA2019 022, arXiv:2007.08981
03/2020 **Genus-zero and genus-one string amplitudes and special multiple zeta values**, *joint with D. Zagier*, *Commun. Number Theory Phys.* Vol. 14 no. 2 (2020) 413–452, arXiv:1906.12339
01/2019 **Modular and holomorphic graph functions from superstring amplitudes**, *Conference Proceedings Elliptic Integrals, Elliptic Functions and Modular Forms in Quantum Field Theory (2019)*, *Chap. 18, 459–484*, Springer-Verlag Wien, arXiv:1807.04506
01/2019 **From elliptic multiple zeta values to modular graph functions: open and closed strings at one loop**, *joint with J. Brödel and O. Schlotterer*, *J. High Energ. Phys.* Vol. 2019 Nr. 01 (2019) 155, arXiv:1803.00527
12/2016 **Single-valued multiple zeta values in genus 1 superstring amplitudes**, *Commun. Number Theory Phys.* Vol. 10 no. 4 (2016) 703–737, arXiv:1512.05689
04/2016 **Counting invertible potentials**, *joint with A. Ros Camacho*, Appendix to “Strangely dual orbifold equivalence I” from R. Newton, A. Ros Camacho, *Journal of Singularities* Vol. 14 (2016) 46–51, arXiv:1509.08069

Preprints

- 06/2024 **Schottky–Kronecker forms and hyperelliptic polylogarithms**, *joint with K. Baune, J. Broedel, E. Im and A. Lisitsyn*, arXiv:2406.10051
07/2023 **Elliptic hyperlogarithms**, *joint with B. Enriquez*, arXiv:2307.01833

- 12/2022 **Analogues of hyperlogarithm functions on affine complex curves**, joint with B. Enriquez, arXiv:2212.03119
- 10/2021 **Construction of Maurer-Cartan elements over configuration spaces of curves**, joint with B. Enriquez, arXiv:2110.09341

Grants and awards

- 2023-2027 **“Beatriz Galindo junior” grant**
- 2020-2022 **“Marie Curie Individual Fellowship” grant**, for the project “Higher genus polylogarithms and scattering amplitudes” (HIPSAM), European Union’s HORIZON 2020 Programme
- 2017-2019 **“Prestige” co-financing grant**, for the project “The mathematical structure of Feynman amplitudes in string theory”, European Union’s Seventh Framework Programme
- 2014 **Master Thesis prize**, INdAM (Istituto Nazionale di Alta Matematica - National Institute for Advanced Mathematics)
- 2011-2013 **INdAM master grant**, awarded to the top 7 Italian master students in mathematics
- 2008-2011 **INdAM bachelor grant**, awarded to the top 40 Italian freshmen in mathematics

Organization of scientific events

- 2020-now **Online seminar** “Motives and Period Integrals in Quantum Field Theory and String Theory”
- 02/2024 **Workshop** “Jornada sobre Superficies de Riemann”, UNED (Madrid, Spain)
- 07/2022 **AMS-SMF-EMS Joint International Meeting** “Special Session on Mathematical Physics of Gravity”, Grenoble University (France)
- 2017-2019 **Seminar** “Motives and Feynman integrals”, École Polytechnique (Paris, France)
- 09/2015 **School** “Introductory school to moduli spaces”, Max Planck Institute for Mathematics (Bonn, Germany)

Teaching, mentoring and outreach

- 2022-2023 **College tutorials**, *Metric Spaces and Complex Analysis, Integration, Group Theory, Multidimensional Analysis and Geometry*, University of Oxford (UK)
- Spring 2019 **Exercise classes**, *Sequences, integrals and linear algebra*, Sorbonne University, IMJ (Paris, France)
- 09/2018 **Co-supervision** of the exchange PhD student Ekta Chaubey, in the framework of a joint doctoral school programme between Mainz University and IPHT Paris-Saclay.
- 09/2015 **Graduate level mini-course**, *Modular forms*, MPIM (Bonn, Germany)
- 2010-2011 **Scientific guide** at the *Center for research on communication and informal learning of mathematics “Matematita”* (Milan, Italy).
- 2007-2011 **Private tutoring in mathematics and physics**, *Bachelor students in economics and engineering, high school students*, Milan (Italy)

Professional service

- Referee for: Communications in Mathematical Physics, Communications in Number Theory and Physics, Journal of High Energy Physics, Journal of Integer Sequences, MathSciNet, zbMATH Open

Selected talks

Conferences and workshops

- 05/2024 **GGI (Florence, Italy)**, Programme “Resurgence and Modularity in QFT and String Theory”
- 04/2024 **HIM (Bonn, Germany)**, Follow-up workshop “Periods in Physics, Number Theory and Algebraic Geometry”
- 03/2024 **UNIGE (Geneva, Switzerland)**, Workshop “Multiple zeta values, associators and related topics”
- 09/2023 **ETH (Zurich, Switzerland)**, Workshop “Elliptics and beyond ’23”
- 06/2023 **Pollica Physics Center (Italy)**, Workshop “New connections between Physics and Number Theory”
- 03/2023 **Bethe Center for Theoretical Physics (Bonn, Germany)**, Workshop “Geometries and Special Functions for Physics and Mathematics”
- 11/2022 **IHES (Bures-sur-Yvette, France)**, 10th Itzykson seminar
- 09/2022 **INI (Cambridge, UK)**, Programme “New Connections in Number Theory and Physics”
- 07/2022 **Grenoble University (France)**, AMS-EMS-SMF Joint International Meeting
- 05/2022 **Nice University (France)**, Fifth International Workshop on Zeta Functions in Algebra and Geometry, Talk cancelled due to Covid positivity

- 05/2021 **ENS Lyon (France)**, Conference “Rendez-vous on Special Values and Periods” (RSVP)
- 09/2020 **MITP (Mainz, Germany)**, Conference “Elliptics and beyond 2020”
- 02/2020 **Sirius Mathematics Center (Sochi, Russia)**, Conference “Integrable systems and automorphic forms”
- 09/2019 **Montpellier University (France)**, Workshop “Multiple zeta values and deformation quantization”
- 07/2019 **Trinity College Dublin (Ireland)**, Conference “Amplitudes 2019”
- 06/2019 **Uppsala University (Sweden)**, Workshop “Supergravity divergences and modular graph forms”
- 04/2019 **ETH (Zurich, Switzerland)**, Workshop “Modular forms, periods and scattering amplitudes”
- 11/2018 **GGI (Florence, Italy)**, Programme “Amplitudes in the LHC era”
- 03/2018 **HIM (Bonn, Germany)**, Workshop “Amplitudes and periods”
- 10/2017 **DESY Zeuthen (Germany)**, Conference “Elliptic Integrals, Elliptic Functions and Modular Forms in Quantum Field Theory”
- 02/2017 **Humboldt University (Berlin, Germany)**, Conference “KMPB-day 2017”

Seminars

- 02/2024 **UCM (Madrid, Spain)**, Mathematical physics and algebraic geometry seminar (MAPHYAG)
- 01/2023 **Strasbourg University (France)**, Algebra and topology seminar
- 10/2022 **Universidad Nacional de Colombia (Bogotá, Colombia)**, Online algebraic geometry seminar
- 04/2022 **ETH (Zurich, Switzerland)**, QFT, strings and beyond seminar
- 03/2022 **Durham University (UK)**, High Energy Physics seminar
- 02/2022 **Montpellier University (France)**, AGATA seminar
- 01/2022 **Dijon University (France)**, Mathematical physics seminar
- 04/2021 **IMPA (Rio de Janeiro, Brasil)**, GADEPs seminar
- 12/2020 **Nagoya University (Japan)**, Japan Europe number theory exchange seminar (JENTE)
- 11/2020 **Strasbourg University (France)**, Algebraic geometry seminar
- 04/2019 **Sorbonne University (Paris, France)**, Mathematical physics seminar
- 02/2019 **École polytechnique (Paris, France)**, Seminar “Motifs et intégrales de Feynman”
- 11/2018 **Chalmers University (Gothenburg, Sweden)**, Number theory seminar
- 05/2018 **Montpellier University (France)**, Algebraic geometry seminar
- 04/2018 **Utrecht University (Netherlands)**, MathPhys seminar
- 03/2018 **IPhT CEA-Saclay (Paris, France)**, Mathematical physics seminar
- 03/2018 **Sorbonne University (Paris, France)**, Number theory seminar
- 12/2017 **École polytechnique (Paris, France)**, Seminar “Motifs et intégrales de Feynman”
- 02/2017 **MPIM (Bonn, Germany)**, Seminar on Algebra, Geometry and Physics
- 11/2016 **ICTP (Trieste, Italy)**, Number theory seminar
- 11/2016 **Oxford University (UK)**, Relativity seminar
- 11/2016 **MPIM (Bonn, Germany)**, Oberseminar
- 09/2016 **Milan University (Italy)**, Analytic number theory seminar
- 05/2016 **ETH (Zurich, Switzerland)**, Mathematical physics seminar

Scientific visits

- 08/22-09/22 **INI (Cambridge, UK)**, *Programme “New Connections in Number Theory and Physics”*
- 06/2022 **University of Oxford (UK)**
- 02/22-03/22 **University of Oxford (UK)**
- 10/20-12/20 **Strasbourg University (France)**
- 11/2018 **GGI (Florence, Italy)**, *Programme “Amplitudes in the LHC era”*
- 02/18-03/18 **HIM (Bonn, Germany)**, *Hausdorff Trimester Programme “Periods in Number Theory, Algebraic Geometry and Physics”*
- 10/2015 **Max Planck Institute for Gravitational Physics (Potsdam, Germany)**
- 09/2015 **IHES (Bures sur Yvette, France)**

Languages

- Fluent English, Italian, French, Spanish
- Intermediate German