Federico Zerbini

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Personal Information

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

Employment

From 09/2020	**Marie Curie Postdoctoral Fellow**, *Institut de Physique Théorique (IPhT), CEA-Saclay (Paris, France)*.
10/2019- 08/2020	**LabEx IRMIA Postdoctoral Fellow**, *Institut de Recherche Mathématique Avancée (IRMA) at Strasbourg University (Strasbourg, France)*.
11/2017- 09/2019	**LabEx Hadamard Postdoctoral Fellow in "Mathematics and Physics"**, *Institut de Physique Théorique (IPhT), CEA-Saclay (Paris, France)*.

Education

10/2017	**Ph.D. in mathematics**, *Max Planck Institute for Mathematics (Bonn, Germany)*, thesis: "Elliptic multiple zeta values, modular graph functions and genus 1 superstring scattering amplitudes", supervised by Prof. Don Zagier.
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.

Fields of research

Mathematical aspects of string theory, periods, modular forms, special functions.

Publications

Preprints

12/2018	**Single-valued hyperlogarithms, correlation functions and closed string amplitudes**, *joint with P. Vanhove*, arXiv:1812.03018.

To appear

07/2020	**Building blocks of closed and open string amplitudes**, *joint with P. Vanhove*, To appear in the proceedings of the conference *Mathemamplitudes* (2020), arXiv:2007.08981.

Published

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.

Grants and awards

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 **Co-organizer of the web-seminar "Motives and period integrals in Quantum Field Theory and String Theory"**.

2017-2019 **Co-organizer of the seminar "Motives and Feynman integrals"**, *École Polytechnique (Paris, France)*.

09/2015 **Co-organizer of the school "Introductory school to moduli spaces"**, *Max Planck Institute for Mathematics (Bonn, Germany)*.

Talks

Conferences and workshops

05/2021 **ENS Lyon (France, Germany)**, *New modular forms from string theory, and single-valued periods*, Conference "Rendez-vous on Special Values and Periods" (RSVP).

09/2020 **MITP (Mainz, Germany)**, *Elliptic polylogarithms and superstring amplitudes*, Conference "Elliptics and beyond 2020".

02/2020 **Sirius Mathematics Center (Sochi, Russia)**, *String amplitudes from genus zero to genus one*, Conference "Integrable systems and automorphic forms".

09/2019 **Montpellier University (France)**, *Single-valued polylogarithms*, Workshop "Multiple zeta values and deformation quantization".

07/2019 **Trinity College Dublin (Ireland)**, *String amplitudes from genus zero to genus one*, Conference "Amplitudes 2019".

04/2019 **Uppsala University (Sweden)**, *String amplitudes from genus zero to genus one*, Workshop "Supergravity divergences and modular graph forms".

04/2019 **ETH (Zurich, Switzerland)**, *Relations between genus-zero and genus-one string amplitudes*, Workshop "Modular forms, periods and scattering amplitudes".

11/2018 **Galileo Galilei Institute (Florence, Italy)**, *Modular graph functions, multiple zeta values and iterated Eichler integrals*, Workshop "Amplitudes in the LHC era".

03/2018 **Hausdorff Institute for Mathematics (Bonn, Germany)**, *Elliptic multiple zeta values and string amplitudes*, Workshop "Amplitudes and periods".

10/2017 **DESY Zeuthen (Germany)**, *Genus one superstring amplitudes and modular forms*, Conference "Elliptic Integrals, Elliptic Functions and Modular Forms in Quantum Field Theory".

02/2017 **Humboldt University (Berlin, Germany)**, *Superstring amplitudes in genus 1*, Conference "KMPB-day 2017".

Selected seminars

04/2021 **IMPA (Rio de Janeiro, Brasil)**, *The periods of string theory amplitudes*, GADEPs seminar.

12/2020	**Nagoya University (Japan)**, *Single-valued multiple zeta values, and a new class of modular forms from string theory*, Japan Europe number theory exchange seminar (JENTE).
11/2020	**Strasbourg University (France)**, *Single-valued periods and applications in string theory*, Algebraic geometry seminar.
04/2019	**Sorbonne University (Paris, France)**, *The mathematical structure of superstring amplitudes*, Mathematical physics seminar.
02/2019	**École polytechnique (Paris, France)**, *Single-valued multiple zeta values in genus-zero string amplitudes*, Seminar "Motifs et intégrales de Feynman".
11/2018	**Chalmers University (Gothenburg, Sweden)**, *A class of non-holomorphic modular forms from string theory*.
05/2018	**Montpellier University (France)**, *Feynman periods and Eichler integrals of modular forms*, Algebraic geometry seminar.
04/2018	**Utrecht University (Netherlands)**, *Eichler integrals of modular forms in physics*, MathPhys seminar.
03/2018	**IPhT CEA-Saclay (Paris, France)**, *String amplitudes in genus one: from open to closed strings*, Mathematical physics seminar.
03/2018	**Sorbonne University (Paris, France)**, *Elliptic multiple zeta values and iterated Eichler integrals*, Number theory seminar.
02/2017	**MPIM (Bonn, Germany)**, *Superstring amplitudes and multiple zeta values*, Seminar on Algebra, Geometry and Physics.
11/2016	**ICTP (Trieste, Italy)**, *The number theory of superstring amplitudes*.
11/2016	**Oxford University (UK)**, *The number theory of superstring scattering amplitudes*, Relativity seminar.
09/2016	**Milan University (Italy)**, *Polylogarithms and superstring Feynman integrals*.
05/2016	**ETH (Zurich, Switzerland)**, *Single-valued multiple zeta values in superstring amplitudes*, Mathematical physics seminar.

Scientific visits

10/20-12/20	**Strasbourg University (France)**.
02/18-03/18	**Hausdorff Institute for Mathematics (Bonn, Germany)**, *Hausdorff Trimester Programme "Periods in Number Theory, Algebraic Geometry and Physics"*.
10/2015	**Max Planck Institute for Gravitational Physics (AEI, Potsdam, Germany)**.
09/2015	**Institute des Hautes Études Scientifiques (IHES, Bures sur Yvette, France)**.

Teaching experience

01/2019-05/2019	**Bachelor level exercise classes**, *Sequences, integrals and linear algebra*, Sorbonne University, IMJ (Paris, France).
09/2015	**Graduate level mini-course**, *Modular forms*, MPIM (Bonn, Germany).

Students supervision

09/2018	Co-supervision of the exchange PhD student Ekta Chaubey

Professional service

Referee for:	Commun. Mathematical Physics, Commun. Number Theory and Physics, MathSciNet, JHEP

Languages

Fluent	Italian, English, French, Spanish
Intermediate	German