Federico Zerbini

Mathematical Institute, University of Oxford
Andrew Wiles Building, Radcliffe Observatory Quarter (550)
Woodstock Road, Oxford, OX2 6GG (UK)
✉ federico.zerbini@maths.ox.ac.uk

Personal Information

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

Employment

From 10/2022	**Stipendiary Lecturer**, *St. Peter's College, University of Oxford (UK)*.
From 09/2022	**Postdoctoral fellow**, *Mathematical Institute, University of Oxford (UK)*.
09/2020-08/2022	**Marie Sklodowska-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 (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.

Articles

Published

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.

To appear

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.

Preprints

10/2021	**Construction of Maurer-Cartan elements over configuration spaces of curves**, *joint with B. Enriquez*, arXiv:2110.09341.

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

07/2022   **AMS-SMF-EMS Joint International Meeting** "Special Session on Mathematical Physics of Gravity", Grenoble University (France)

2020-now   **Online seminar** "Motives and Period Integrals in Quantum Field Theory and String Theory"

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

Spring 2019   **Exercise classes**, *Sequences, integrals and linear algebra (bachelor course)*, 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

09/2022   **INI (Cambridge, UK)**, Programme "New Connections in Number Theory and Physics.

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   **Galileo Galilei Institute (Florence, Italy)**, Programme "Amplitudes in the LHC era".

03/2018   **Hausdorff Institute for Mathematics (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

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**, 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	**Sorbonne University (Paris, France)**, Number theory seminar.
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.
09/2016	**Milan University (Italy)**, Analytic number theory seminar.
05/2016	**ETH (Zurich, Switzerland)**, Mathematical physics seminar.

Scientific visits

08/22-09/22	**Isaac Newton Institute (Cambridge, UK)**, *Programme "New Connections in Number Theory and Physics".*
02/18-03/18	**Hausdorff Institute for Mathematics (Bonn, Germany)**, *Hausdorff Trimester Programme "Periods in Number Theory, Algebraic Geometry and Physics".*
06/22	**University of Oxford (UK)**.
02/22-03/22	**University of Oxford (UK)**.
10/20-12/20	**Strasbourg University (France)**.
11/2018	**Galileo Galilei Institute (Florence, Italy)**, *Programme "Amplitudes in the LHC era".*
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 (Potsdam, Germany)**.
09/2015	**Institute des Hautes Études Scientifiques (IHES, Bures sur Yvette, France)**.

Languages

Fluent	English, Italian, French, Spanish
Intermediate	German