

Claudia Rella

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Institut des Hautes Études Scientifiques (IHES)
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EMPLOYMENT

Postdoctoral Researcher in Mathematics from Oct 2024
Institut des Hautes Études Scientifiques (IHES), France
Affiliations: Huawei Young Talents Program.

EDUCATION

Ph.D. in Mathematical Physics – Très Bien (highest honours) 2020 – 2024
Department of Theoretical Physics, University of Geneva, Switzerland
Thesis: *On the arithmetic of resurgent topological strings*. Supervised by Prof. Marcos Mariño.
Affiliations: ERC SyG ReNewQuantum and NCCR SwissMAP.

M.Sc. in Mathematical and Theoretical Physics – Distinction (highest honours) 2018 – 2019
Mathematical Institute and Department of Physics, University of Oxford, UK
Thesis: *Motivic amplitudes*. Supervised by Prof. Francis Brown.
Affiliations: St John's College.

B.Sc. in Physics (*) – Summa cum Laude (highest honours) 2015 – 2018
Department of Physics, Sapienza University of Rome, Italy
Thesis: *Photonic Bloch waves*. Supervised by Prof. Fabio Sciarrino.
(*) : Extra-curricular coursework in Mathematics at the Department of Mathematics.

RESEARCH EXPERIENCE AND INTERSHIPS

Research Internship in High-Energy Physics Phenomenology 2020, Jul – Sep
CERN, Geneva, Switzerland

Master Class in Mathematical Physics 2019, Sep – 2020, Jun
NCCR SwissMAP and Mathematics Section, University of Geneva, Switzerland

Business Consulting Internship 2019, Jul – Aug
Pangea Formazione, Rome, Italy

Research Internship in Experimental Particle Physics 2017, Sep – Nov
PADME @ INFN – LNF, Frascati, Italy

OTHER ACTIVITIES

Cooperation Associate of the Department of Theoretical Physics 2022, May – 2024, Sep
CERN, Switzerland

Junior Member of the Scientific Council of the SRS Conference Centre 2020, Sep – 2024, Sep
SwissMAP Research Station (SRS), Switzerland

Mentee at LeadTheFuture Mentorship Program 2019, Sep – present
LeadTheFuture, Italy

PUBLICATIONS

Modular resurgence, q-Pochhammer symbols, and quantum operators from mirror curves 2025, Jun
With V. Fantini
arXiv:2506.08265

Strong-weak symmetry and quantum modularity of resurgent topological strings on local \mathbb{P}^2 With V. Fantini, <i>Commun. Number Theory Phys.</i> 19 (2025), No. 1, pp. 1-73 https://dx.doi.org/10.4310/CNTP.250215002033	2025, Feb
On the arithmetic of resurgent topological strings <i>Doctoral Thesis</i> https://dx.doi.org/10.13097/archive-ouverte/unige:181979	2024, Sep
Modular resurgent structures With V. Fantini <i>arXiv:2404.11550</i>	2024, Apr
On the structure of wave functions in complex Chern–Simons theory With M. Mariño <i>arXiv:2312.00624</i>	2023, Dec
Resurgence, Stokes constants, and arithmetic functions in topological string theory <i>Commun. Number Theory Phys.</i> 17 (2023), No. 3, pp. 709-820 https://dx.doi.org/10.4310/CNTP.2023.v17.n3.a4	2023, Nov
Searching for muonphilic dark sectors with proton beams With B. Döbrich and T.-T. Yu, <i>Phys. Rev. D</i> 106 (2022) 3, 035023 https://doi.org/10.1103/PhysRevD.106.035023	2022, Aug
An introduction to motivic Feynman integrals <i>SIGMA</i> 17 (2021), 032, 56 pages https://doi.org/10.3842/SIGMA.2021.032	2021, Mar
Characterization and performance of PADME's Cherenkov-based small-angle calorimeter With A. Frankenthal et al., <i>Nucl. Instrum. Methods Phys. Res. A</i> 919 (2019) 89-97 https://doi.org/10.1016/j.nima.2018.12.035	2019, Mar
TALKS AND SEMINARS	
Resurgence and arithmetic of q-series: from quantum operators to quantum modular forms <i>Random Matrix Theory Seminar, University of Oxford, UK</i>	2025, May
Resurgence, number theory, and quantum mirror curves <i>Mathematical Physics and Algebraic Geometry Seminar, CMSA, Harvard University, USA</i>	2025, May
The arithmetic of non-perturbative effects <i>Conference on Higher Structures, Moduli Spaces and Integrability, Universität Hamburg, Germany</i>	2025, Apr
Resurgence, number theory, and quantum mirror curves <i>Workshop on The Arithmetic of Calabi-Yau Manifolds, MITP, Germany</i>	2025, Mar
The arithmetic of resurgent topological strings <i>Youngst@rs Physics and Number Theory, MITP, Germany</i>	2025, Jan
The arithmetic of resurgent topological strings <i>The Seed Seminar of Mathematics and Physics, IHP, France</i>	2024, Nov
The arithmetic of resurgent topological strings <i>Workshop on Holonomic Techniques for Feynman Integrals, MPP, Germany</i>	2024, Oct
Strong-weak symmetry and quantum modularity of resurgent topological strings <i>GAP XIX: Moduli Spaces and Higher Structures, Sapienza University of Rome, Italy</i>	2024, Sep
On the structure of wave functions in complex Chern–Simons theory <i>String Theory Seminar, University of Geneva, Switzerland</i>	2024, May
Strong-weak symmetry and quantum modularity of resurgent topological strings	2024, May

Strong-weak symmetry and quantum modularity of resurgent topological strings <i>Mathematics Seminar, Yale University, USA</i>	2024, May
On the structure of wave functions in complex Chern–Simons theory <i>String Theory Seminar, CERN, Switzerland</i>	2024, Apr
Strong-weak duality and quantum modularity of resurgent topological strings <i>Seminar on Quantum Modularity and Resurgence, IHES, France</i>	2024, Mar
Resurgence and Calabi–Yau geometries <i>Workshop on Positive Geometry in Particle Physics and Cosmology, MPI MiS, Germany</i>	2024, Feb
Strong-weak duality and quantum modularity of resurgent topological strings <i>Geometry and Physics Seminar, University of Sheffield, UK</i>	2023, Dec
Strong-weak duality and quantum modularity of resurgent topological strings <i>QM Research Seminar, Centre for Quantum Mathematics, SDU, Denmark</i>	2023, Nov
Resurgence, Stokes constants, and arithmetic functions in topological string theory <i>29th Nordic Congress of Mathematicians with EMS, Aalborg, Denmark</i>	2023, Jul
Resurgence, Stokes constants, and arithmetic functions in topological string theory <i>Mathematics Seminar, IHES, France</i>	2023, Apr
Resurgence, Stokes constants, and arithmetic functions in topological string theory <i>Physical Mathematics Seminar, University of Geneva, Switzerland</i>	2023, Mar
Stokes constants in topological string theory <i>Workshop on Mathematics of Beyond All-Orders Phenomena, University of Cambridge, UK</i>	2022, Nov
An introduction to motivic amplitudes <i>Seminar on Lie Groups and Moduli Spaces, University of Geneva, Switzerland</i>	2019, Nov
Motivic scattering amplitudes <i>Conference on Representation Theory and Integrable Systems, ETH Zürich, Switzerland</i>	2019, Aug
Monte Carlo simulation of PADME’s small-angle calorimeter <i>PADME Weekly Seminar, INFN – LNF, Italy</i>	2017, Dec

TEACHING EXPERIENCE

Teaching Assistant on Feynman Integrals and Number Theory <i>Winter School in Mathematical Physics – SwissMAP Research Station, Les Diablerets, Switzerland</i>	2024, Jan
Lecturer on Topological Surfaces <i>Master Class in Mathematical Physics – Mathematics Section, University of Geneva, Switzerland</i>	2019, Oct
Lecturer on Riemannian Geometry <i>Excellence Program in Physics – Department of Mathematics, Sapienza University of Rome, Italy</i>	2018, Mar – May

ACADEMIC ACHIEVEMENTS AND SCHOLARSHIPS

Excellence Fellowship <i>NCCR SwissMAP, Switzerland</i>	2019 – 2020
Degree Prize for Distinction <i>St John’s College, University of Oxford, UK</i>	2019
Torno Subito Scholarship <i>Department of Education, Research, and University, Lazio, Italy</i>	2018 – 2019

Best Student Award for the Course in Nuclear and Subnuclear Physics <i>Sapienza University of Rome and INFN, Italy</i>	2018
Summer Student Scholarship <i>INFN, Italy</i>	2017
Excellence Program <i>Department of Physics, Sapienza University of Rome, Italy</i>	2016 – 2018
Deserving Student Scholarship <i>Sapienza University of Rome, Italy</i>	2015 – 2018

SKILLS

Languages	Italian (native), English
Programming Languages	C, C++, Python, R
Data Analysis Languages	MATLAB, ROOT, Gnuplot
Symbolic Calculus Languages	Mathematica, SageMath, PARI/GP
Version-control Systems	Git
Simulation Software	Geant4