Claudia Rella

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Institut des Hautes Études Scientifiques (IHES)
35 Route de Chartres, 91440 Bures-sur-Yvette, France

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 INTERNSHIPS

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

Strong-weak symmetry and quantum modularity of resurgent topological strings on local $\mathbb{P}^2$ — 2025, Feb
With V. Fantini, Commun. Number Theory Phys. 19 (2025), No. 1, pp. 1-73
https://dx.doi.org/10.4310/CNTP.250215002033

On the arithmetic of resurgent topological strings — 2024, Sep
Doctoral Thesis
https://dx.doi.org/10.13097/archive-ouverte/unige:181979

Modular resurgent structures — 2024, Apr
With V. Fantini
arXiv:2404.11550

On the structure of wave functions in complex Chern–Simons theory — 2023, Dec
With M. Mariño
arXiv:2312.00624

Resurgence, Stokes constants, and arithmetic functions in topological string theory — 2023, Nov
Commun. Number Theory Phys. 17 (2023), No. 3, pp. 709-820
https://dx.doi.org/10.4310/CNTP.2023.v17.n3.a4

Searching for muonphilic dark sectors with proton beams — 2022, Aug
With B. Döbrich and T.-T. Yu, Phys. Rev. D 106 (2022) 3, 035023
https://doi.org/10.1103/PhysRevD.106.035023

An introduction to motivic Feynman integrals — 2021, Mar
SIGMA 17 (2021), 032, 56 pages
https://doi.org/10.3842/SIGMA.2021.032

Characterization and performance of PADME's Cherenkov-based small-angle calorimeter — 2019, Mar
With A. Frankenthal et al., Nucl. Instrum. Methods Phys. Res. A 919 (2019) 89-97
https://doi.org/10.1016/j.nima.2018.12.035

TALKS AND SEMINARS

The arithmetic of resurgent topological strings — 2025, Jan
Youngst@rs Physics and Number Theory, MITP, Germany

The arithmetic of resurgent topological strings — 2024, Nov
The Seed Seminar of Mathematics and Physics, Institut Henri Poincaré, France

The arithmetic of resurgent topological strings — 2024, Oct
Workshop on Holonomic Techniques for Feynman Integrals, MPP, Germany

Strong-weak symmetry and quantum modularity of resurgent topological strings — 2024, Sep
GAP XIX: Moduli spaces and higher structures, Sapienza University of Rome, Italy

On the structure of wave functions in complex Chern–Simons theory — 2024, May
String Theory Seminar, University of Geneva, Switzerland

Strong-weak symmetry and quantum modularity of resurgent topological strings — 2024, May
Workshop on Resurgence and Modularity in QFT and String Theory, GGI, Italy

Strong-weak symmetry and quantum modularity of resurgent topological strings — 2024, May
Mathematics Seminar, Yale University, USA

On the structure of wave functions in complex Chern–Simons theory — 2024, Apr
String Theory Seminar, CERN, Switzerland

Strong-weak duality and quantum modularity of resurgent topological strings — 2024, Mar
Seminar on Quantum Modularity and Resurgence, IHES, France

Resurgence and Calabi–Yau geometries — 2024, Feb
Workshop on Positive Geometry in Particle Physics and Cosmology, MPI MiS, Germany

Strong-weak duality and quantum modularity of resurgent topological strings — 2023, Dec
Geometry and Physics Seminar, University of Sheffield, UK

Strong-weak duality and quantum modularity of resurgent topological strings — 2023, Nov
QM Research Seminar, Centre for Quantum Mathematics, SDU, Denmark

Resurgence, Stokes constants, and arithmetic functions in topological string theory — 2023, Jul
29th Nordic Congress of Mathematicians with EMS, Aalborg, Denmark

Resurgence, Stokes constants, and arithmetic functions in topological string theory — 2023, Apr
Mathematics Seminar, IHES, France

Resurgence, Stokes constants, and arithmetic functions in topological string theory — 2023, Mar
Physical Mathematics Seminar, University of Geneva, Switzerland

Stokes constants in topological string theory — 2022, Nov
Workshop on Mathematics of Beyond All-Orders Phenomena, University of Cambridge, UK

An introduction to motivic amplitudes — 2019, Nov
Seminar on Lie Groups and Moduli Spaces, University of Geneva, Switzerland

Motivic scattering amplitudes — 2019, Aug
Conference on Representation Theory and Integrable Systems, ETH Zürich, Switzerland

Monte Carlo simulation of PADME's small-angle calorimeter — 2017, Dec
PADME Weekly Seminar, INFN – LNF, Italy

TEACHING EXPERIENCE

Teaching Assistant on Feynman Integrals and Number Theory — 2024, Jan
Winter School in Mathematical Physics – SwissMAP Research Station, Les Diablerets, Switzerland

Lecturer on Topological Surfaces — 2019, Oct
Master Class in Mathematical Physics – Mathematics Section, University of Geneva, Switzerland

Lecturer on Riemannian Geometry — 2018, Mar – May
Excellence Program in Physics – Department of Mathematics, Sapienza University of Rome, Italy

ACADEMIC ACHIEVEMENTS AND SCHOLARSHIPS

Excellence Fellowship — 2019 – 2020
NCCR SwissMAP, Switzerland

Degree Prize for Distinction — 2019
St John's College, University of Oxford, UK

Torno Subito Scholarship — 2018 – 2019
Department of Education, Research, and University, Lazio, Italy

Best Student Award for the Course in Nuclear and Subnuclear Physics — 2018
Sapienza University of Rome and INFN, Italy

Summer Student Scholarship — 2017
INFN, Italy

Excellence Program — 2016 – 2018
Department of Physics, Sapienza University of Rome, Italy

Deserving Student Scholarship — 2015 – 2018
Sapienza University of Rome, Italy

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