

Claudia Rella

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EDUCATION

Master Class in Mathematical Physics

Sep 2019 – present

Department of Mathematics, University of Geneva, Switzerland

- Excellence Fellow of the NCCR (National Centre of Competence in Research) SwissMAP

Master of Science in Mathematical and Theoretical Physics

Sep 2018 – Jul 2019

Mathematical Institute and Department of Physics, University of Oxford, UK

- Degree awarded on 11/07/2019 with final grade *Distinction*
- Thesis on *Motivic Amplitudes* under supervision of Prof. Francis Brown
- Affiliation with St John's College

Coursework in Physics:

- General Relativity – Relativistic Quantum Field Theory – Gauge Field Theory – Bosonic String Theory – Standard Model and Beyond – Topological Quantum Field Theory – Topological Quantum Matter – Topological Quantum Computation – Radiative Processes in Astrophysics – High-Energy Astrophysics

Coursework in Mathematics:

- Groups Representations – Algebraic Geometry – Homology and Cohomology Theory

Bachelor of Science in Physics

Sep 2015 – Jul 2018

Department of Physics, University of Rome La Sapienza, Italy

- Degree awarded on 25/07/2018 with final grade *Summa cum Laude*
- Thesis on *Photonic Bloch Waves* under supervision of Prof. Fabio Sciarino
- Attainment of extra-curricular exams in the fields of Algebra and Geometry at Department of Mathematics

Coursework in Physics:

- Classical, Analytical and Relativistic Mechanics – Inorganic Chemistry – Thermodynamics – Electromagnetism – Electronic Circuits – Non-Relativistic Quantum Mechanics – Classical and Quantum Statistical Mechanics – Nuclear and Subnuclear Physics – Atomic and Molecular Physics – Optics

Coursework in Mathematics:

- Number Theory – Linear Algebra – Groups, Rings and Fields – Galois Theory – Modules and Algebras – Representation Theory – Real Analysis – Complex and Functional Analysis – Affine and Projective and Differential Geometry – General, Algebraic and Differential Topology – Probability Calculus

Coursework in Informatics:

- C Programming Language – Numerical Analysis – Algorithms

RESEARCH EXPERIENCE AND INTERSHIPS

Software Engineering Intern

2019, Jul

Pangea Formazione, Rome, Italy

- Participation in a Deep Learning project finalised to developing a predictive model for planned preventative maintenance of large infrastructures equipped with alarm nets, fitting the specific automation processes of the network Open Fiber
- Project implemented using Bayesian Neural Networks and programming languages R and Python

Research Intern

2017, Sep – Nov

LNF (National Laboratories of Frascati), INFN (National Institute of Nuclear Physics), Italy

- Participation in the experimental project PADME (Positron Annihilation into Dark Matter Experiment) under supervision of Prof. Mauro Raggi
- Implementation of a Monte Carlo simulation of a prototype of the Small-Angle Calorimeter using software Geant4 and programming language C++
- Characterisation of the performance of a single PbF₂ crystal attached to a Hamamatsu R13478UV photomultiplier tube in terms of energy and timing resolutions

TEACHING EXPERIENCE

Lectures on Topological Surfaces

2019, Oct

Master Class in Mathematical Physics – Department of Mathematics, University of Geneva, Switzerland

Topics of the lectures:

- Introduction to Topological Spaces – Hausdorff Separation Axiom – Connectedness and Compactness – Abstract Topological Manifolds and Surfaces – Normal Forms for Surfaces – Real Projective Plane \mathbb{RP}^2 in detail

Lectures on Riemannian Geometry

2018, Mar – May

Excellence Program in Physics – Department of Mathematics, University of Rome La Sapienza, Italy

Topics of the lectures:

- Introduction to Riemannian Geometry – Riemannian Manifolds with Non-Positive Curvature – Jacobi Fields and Conjugate Points – Cartan-Hadamard Theorem – Killing Fields

WORK EXPERIENCE

Specialist Academic Editor in Mathematics and Statistics

2019, Oct – present

AsiaEdit, Hong Kong

Marker of the Mathematics Admission Test.

2018, Nov

Mathematical Institute, University of Oxford, UK

ACADEMIC ACHIEVEMENTS

Degree Prize for Distinction

2019

St. John's College, University of Oxford, UK

Award to Best Student of the Course in Nuclear and Subnuclear Physics

2018

University of Rome La Sapienza and INFN, Italy

Excellence Program

2016 – 2018

Department of Physics, University of Rome La Sapienza, Italy

Completion of four Advanced Modules under individual supervision:

- Numerical Semigroups (Prof. Valentina Barucci) – Real Analysis (Prof. Eugenio Montefusco) – Riemannian Geometry (Prof. Gabriele Mondello) – Lie Groups and Lie Algebras (Prof. Paolo Papi)

SCHOLARSHIPS

Excellence Fellowship

2019

NCCR SwissMAP, Switzerland

Torno Subito Scholarship

2018

Department of Education, Research and University, Organization for the Right to Higher Education in Regione Lazio, Italy

Summer Student Scholarship

2017

INFN, Italy

Deserving Student Scholarship

2015 – 2018

University of Rome La Sapienza, Italy

Scholarship for Undergraduate Applicants in Mathematics

2015 – 2018

INdAM (National Institute of High Mathematics), Italy

- Declined as a consequence of the enrolment to the BSc in Physics

ATTENDANCE AT CONFERENCES, WORKSHOPS, ETC.

SwissMAP Winter School in Mathematical Physics (*)

2020, Feb

Les Diablerets, Switzerland

6th SwissMAP General Meeting

2019, Sep

Villars-sur-Ollon, Switzerland

School on Modular Forms, Periods and Scattering Amplitudes

2019, Feb

ETH-ITS, Zurich, Switzerland

Workshop on Quantum Foundations. New frontiers in testing quantum mechanics

2017, Nov

INFN-LNF, Frascati, Italy

Workshop Quantum Foundations. The physics of “what happens” and the measurement problem
INFN-LNF, Frascati, Italy

2017, May

TALKS AT CONFERENCES, WORKSHOPS, ETC.

Research Seminar on Lie Groups and Moduli Spaces (*)

2019, Nov

Department of Mathematics, University of Geneva, Switzerland

- Invited talk on Motivic Amplitudes

Conference on Representation Theory and Integrable Systems

2019, Aug

ETH, Zurich, Switzerland

- Contributed talk on Motivic Amplitudes

PADME Weekly Meeting

2017, Dec

INFN-LNF, Frascati, Italy

- Invited talk on the Geant4 Monte Carlo simulation of PADME's SAC

VISITING POSITIONS

Visiting Student

2018, Sep

CERN (European Organization for Nuclear Research)

PUBLICATIONS

Characterization and Performance of PADME's Cherenkov-Based Small-Angle Calorimeter

2019, Mar

A. Frankenthal et al., Nuclear Instruments and Methods in Physics Research A, (vol. **919**, 1 March 2019, pages 89-97),

<https://doi.org/10.1016/j.nima.2018.12.035>

MEMBERSHIPS

Mentee of the LeadTheFuture Mentorship Program

Since 2019

Invited Fellow of the Italian Physics Society

Since 2019

IT SKILLS

Operating Systems	OS, Windows, Linux
Programming Languages	C, C++, HTML, PEARL, R, Python
Typesetting Systems	LaTeX, MS Office
Data Analysis Software	MATLAB, ROOT, gnuplot
Simulation Software	Geant4
Machine Learning	Deep Learning, Bayesian Neural Networks

LANGUAGE SKILLS

Italian	Native
English	Level C2 (CEFRL) - Cambridge ESOL Level 3 Certificate

ARTISTIC SKILLS

Classical ballet student

2005 – 2015

Piano student with mostly classical and jazz interests

2012 – present

(*): expected