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 - Distinction Sep 2018 – Jul 2019
Mathematical Institute and Department of Physics, St John's College, University of Oxford, UK
Thesis on *Motivic Amplitudes* supervised by Prof. Francis Brown
Coursework in Physics:
- General Relativity – Relativistic Quantum Field Theory – Gauge Field Theory – Bosonic String Theory – The Standard Model and Beyond – Topological Quantum Field Theory – Radiative Processes and High-Energy Astrophysics

Coursework in Mathematics:
- Groups Representations – Algebraic Geometry – Homology and Cohomology Theory

Bachelor of Science in Physics – Summa cum Laude Sep 2015 – Jul 2018
Department of Physics, University of Rome La Sapienza, Italy
Thesis on *Photonic Bloch Waves* supervised by Prof. Fabio Sciarrino
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 and Photonics

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 Geometry – Differential Geometry – General, Algebraic and Differential Topology – Probability Calculus

Coursework in Informatics:
- C Programming Language – Numerical Analysis – Algorithms

RESEARCH EXPERIENCE AND INTERNSHIPS

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 the supervision of Prof. Mauro Raggi
- Implementation of a Monte Carlo optical simulation of a prototype of the Small-Angle Calorimeter using software Geant4 and programming language C++
- Characterisation of the performance of a single PbF_2 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 $\mathbb{R}\mathbf{P}^2$ 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 2017, May
INFN-LNF, Frascati, Italy

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 optical simulation of PADME's SAC

VISITING POSITIONS

Visiting Student 2018, Sep
CERN (European Organization for Nuclear Research), Switzerland

PUBLICATIONS

Characterization and Performance of PADME's Cherenkov-Based Small-Angle Calorimeter 2019, Mar
A. Frankenthal at 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 X, Windows, Linux
Programming Languages	C, C++, HTML, Perl, R, Python
Typesetting Systems	LaTeX, MS Office
Version-control Systems	Git
Data Analysis Software	MATLAB, ROOT, gnuplot
Simulation Software	Geant4

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