

# Andrea Tirelli

## Curriculum Vitae

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### Professional Experience

- Apr 2020 – Present **SISSA, International School for Advanced Studies**, *Postdoctoral Researcher*.  
Main tasks: design of Machine Learning models for *ab initio* simulations of Strongly Correlated Systems;  
Expertise: High Performance Computing, Fortran, Mathematical Modelling
- Aug 2019 – Aug 2020 **European Institute of Oncology**, *Research Associate*.  
Main tasks: build bioinformatic pipelines for the analysis of Third Generation Sequencing data; Single-Cell RNA-sequencing data analysis;  
Expertise: Time Series Analysis, Parallelized and HPC Computing, Alignment Algorithms, Mathematical Modelling, Network Analysis
- May 2018 – Aug 2019 **Generali Italia S. p. A.**, *Data Scientist*.  
Main tasks: build Machine Learning models for regression and classification problems using state-of-the-art techniques  
Expertise: Natural Language Processing, Recurrent Neural Networks, Mathematical Modelling

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### Teaching Experience

- Apr 2021 – Present **University of Trieste**, *Teaching Assistant*.  
Course: Introduction to Probability  
Advisor: Prof. Marco Barchiesi
- Apr 2021 **ENFAP Friuli-Venezia Giulia**, *Lecturer*.  
Course: Probability and Statistics
- Sept 2017 – May 2018 **University of Trieste**, *Academic Tutor*.  
Courses: Geometry I, Algebra I, Analysis I  
Advisor: Prof. Emilia Mezzetti
- Sept 2016 – Jun 2017 **Imperial College London**, *Graduate Teaching Assistant*.  
Courses: Geometry and Linear Algebra, Foundations of Analysis, Algebra II, Multivariable Calculus, Analysis I  
Advisor: Prof. Richard Thomas
- Oct 2012 – Jul 2015 **University of Pavia**, *Teaching Assistant*.  
Courses: Linear Algebra and Geometry, Mathematical Analysis for Engineering, Linear Algebra for Architecture, Mathematical and Numerical Methods for Chemistry  
Advisors: Prof. Enrico Vitali, Prof. Jacopo Stoppa, Prof. Marco Veneroni

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### Education

- Sept 2015 – Nov 2018 **London School of Geometry and Number Theory, Imperial College London**,  
*PhD in Pure Mathematics*.  
Thesis: *On symplectic resolutions in the Nonabelian Hodge Correspondence*  
Advisor: Prof. Travis Schedler

Oct 2013 – July 2015 **University of Pavia**, *Master's Degree in Mathematics, Curriculum in Pure Mathematics.*  
Thesis: *K-stability and its relations with constant scalar curvature Kähler orbifolds*  
Advisors: Prof. Jacopo Stoppa (University of Pavia), Dr. Julius Ross (University of Cambridge)  
Mark: 110/110 cum laude

Oct 2010 – July 2013 **University of Pavia**, *Bachelor's Degree in Mathematics.*  
Thesis: *Some results on Theta-Characteristics over an Algebraic Curve*  
Advisor: Prof. Maurizio Cornalba (University of Pavia)  
Mark: 110/110 cum laude

Sept 2005 – Jul 2010 **Liceo Scientifico Leonardo da Vinci**, *High School Diploma.*  
Mark: 100/100

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## Visiting positions

Sep 2017 – May 2018 **International School of Advanced Studies, Trieste**, *Visiting PhD student.*  
Advisor: Prof. Jacopo Stoppa

Apr 2016 – Sep 2016 **Max Planck Institute for Mathematics, Bonn**, *Visiting PhD student.*  
Advisor: Prof. Travis Schedler

Jan 2015 – Apr 2015 **University of Cambridge, UK**, *Visiting MSc student.*  
Advisor: Dr. Julius Ross

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## Scientific Interests

Machine Learning, Mathematical Modelling, Numerical Simulations, Theoretical Computer Science

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## Publications and Preprints

Dec 2018 *Symplectic resolutions for multiplicative quiver varieties and character varieties for punctured surfaces*, accepted for publication on *Proceedings of the conference "Interactions between Representation Theory and Algebraic Geometry"*, Progress in Mathematics series, Birkhäuser Verlag Editor, available in e-print form at [arxiv.org/abs/1812.07687](https://arxiv.org/abs/1812.07687)

Jan 2017 *Symplectic resolutions for Higgs moduli spaces*, *Proceedings of the American Mathematical Society* 147.4 (2019): 1399-1412

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## Grants and Awards

Feb 2017 Research grant from the GEAR Network to visit Dr Laura Schaposnik, University of Illinois at Chicago, USA

Nov 2016 Conference grant from the Heilbronn Institute of Mathematical Research to organise the *British Isles Graduate Workshop*

Sep 2015 Fully funded studentship from the EPSRC Centre for Doctoral Training in Geometry and Number Theory

Sep 2014 Erasmus Placement Grant to visit Professor Julius Ross, University of Cambridge, Cambridge, Feb–May 2015

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## Conferences organised

14 – 20 July 2018 *British Isles Graduate Workshop II, Singularities and Symplectic Topology*, Jersey, United Kingdom

2 – 8 Apr 2017 British Isles Graduate Workshop, *Higgs bundles: algebraic and differential geometric perspectives*, Isle of Wight, United Kingdom

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## Selected Invited talks

- 29 Mar 2018 Spring School: Enumerative Invariants from Differential Graded Lie Algebras and Categories, Castello di Montegufoni, Montespertoli, Italy. “The BV formalism”
- 8 Feb 2018 Geometry and Mathematical Physics Seminar, SISSA, Trieste, Italy. “On the algebraic symplectic geometry of multiplicative quiver varieties”
- 19–23 June 2017 School and Workshop in Algebraic Geometry and Physics, *Higgs bundles and character varieties*, SISSA, Trieste, Italy. “Symplectic resolutions for Higgs moduli spaces”
- 2–8 April 2017 British Isles Graduate Workshop, *Higgs bundles: algebraic and differential geometric perspectives*, Isle of Wight, United Kingdom. “Character varieties through examples”
- 13–19 June 2016 European Talbot Workshop 2016, *Topological aspects of Quantum Field Theories*, Winterberg, Germany. “A survey on the Cobordism Hypothesis”

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## Computer Skills

Basic	C++, Mathematica
Intermediate	C, MatLab
Good	Python, R, $\LaTeX$ , Microsoft Office, GIT, Jira, Confluence
Python Libraries	Pandas, Numpy, Scipy, matplotlib, multiprocessing, multithreading
ML Libraries	Ts-Learn, Scikit-learn, Keras, Tensorflow, Gensim, spaCy

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## Languages

Italian	Native
English	Effective Operational Proficiency (IELTS Certificate C1 equivalent)

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