

# VIOLA GATTUS

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Personal Website: [violagattus.github.io](http://violagattus.github.io)

I showcase my projects and reports in my personal website.

## EDUCATION

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### University of Manchester

2017 – Present day

*MPhys Physics with Theoretical Physics*

First year average grade: 70.4 %

Second year average grade: 74.0%

Third year average grade: 86.2%

- Achieved 92% mark on oral presentation of essay on *The Black Hole Information Paradox* which was peer reviewed by fellow students and complimented for clarity of language and physical insight.
- Obtained high first class mark in Theory Computing Project on *Numerical Solutions of the Time-dependent Schrodinger Equation* solving a more realistic case of quantum scattering using the finite difference method.
- Participated in three Grand Ethical Challenges and was member of the Wellbeing Champions team involved in promoting positive well-being within the Department of Physics and University-wide.
- Currently a student representative for my year in the Department of Physics.

### Scientific Liceo Gramsci-Amaldi (Italy)

2013 – 2017

Esame di Stato (state exams): 100 %

Final year average grade: 9.64/10

- Scientific subjects include Mathematics (10/10), Physics (10/10) and Natural Sciences (10/10)

## ACADEMIC WORK

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- Published article: V Gattus and S Karamitsos 2020 *Eur. J. Phys.* **41** 065407
- Peer-reviewed twice for the IOP journal *Physica Scripta*.
- Speaker at the Undergraduate Research Conference under patronate of IOP and IMA.

## RESEARCH PROJECTS

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### MPhys Project on theoretical physics

Present day

*University of Manchester, supervised by Prof. Bezrukov*

· *Non-commutative approaches to Quantum Field Theory and Inflation*

- Currently working on reformulating QFT in non-commutative spaces, with particular attention to phenomenology and comparison of different theoretical approaches.

### Supervised research team project on condensed matter physics

Summer 2020

*University of Manchester, supervised by Dr. Principi and Prof. Walet*

· *Second quantization, superconductivity and Majorana fermions theory*

- Studied advanced topics of theoretical condensed matter physics from peer-reviewed articles. Have learnt to analyse a paper's content methodically proving the results presented.

- Improved my ability to work in team by collaborating with 13 peers and the supervisors in solving challenging problems.

### **Supervised research project on theoretical physics**

*July 2019 – July 2020*

*University of Manchester, supervised by Dr. Karamitsos*

#### *· Correspondence between classical and quantum uncertainty for coupled systems*

- Worked on finding the classical counterpart to the quantum mechanical uncertainty principle for coupled particle systems. Improved time management working on this project along university studies.
- Wrote a paper titled “Dimensional analysis and the correspondence between classical and quantum uncertainty” in collaboration with Dr. Karamitsos which was published in the *European Journal of Physics*.

### **Supervised research project on theoretical biophysics**

*Summer 2018*

*University of Cagliari, supervised by Prof. Ceccarelli and Dr. Bodrenko*

#### *· Exchange kinetics of two molecular states in NMR*

- Worked in interdisciplinary project encompassing physics, biology and medicine. Project consisted of analysing the exchange kinetics of two molecular states in NMR by performing eigenanalysis on coupled Bloch equations, deriving and interpreting the limit for slow and fast molecular transitions.

## **WORK EXPERIENCE**

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### **Tutoring**

*2019 – Present day*

*MyTutor*

- Experienced tutor at GCSEs and A level of Mathematics and Physics with 30+ hours of completed lessons and great reviews from the students.

### **Student Ambassador**

*October 2019 – December 2019*

*University of Manchester, Department of Physics and Astronomy*

- Worked on welcoming new students to the School of Physics. Improved my ability to work in a team with academic staff to follow on the prescribed schedule and offer the best experience to candidates.

## **TECHNICAL SKILLS AND INTERESTS**

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### **Programming**

- Proficient in the use of Python to fit, graph and analyse complex data set. Wrote 2D finite difference numerical solver for Theory Computing project.
- Good knowledge of Mathematica to perform integrals with numerical methods such as Composite Simpson’s rule, graph and manipulate data.
- Basic knowledge of C++, HTML and CSS.

### **Extracurricular activities**

- Independent physics outreach at my former high school; introducing fundamentals of quantum mechanics to 12th grade students helped to improve my communication and presenting skills.
- Was selected for and attended the 2020 Conference for Undergraduate Women in Physics to discuss gender inequality in physics and engage in various networking activities.