

# Fannie Vaquero

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**MSci. Theoretical Physics | Problem Solver**

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**Languages :** English | French

## Skills

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Python | Advanced Mathematics | Problem Solving | Data Analysis | LaTeX | NumPy | MATLAB | Excel | PowerPoint | Analytical Skills

## Education

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SEP 2019 - SEP 2023 | **MSci Physics with Theoretical Physics | King's College London | First Class Honours**

SEP 2016 - JUL 2017 | **CPGE - Classe Préparatoire aux Grandes Ecoles | PCSI | Lycée René Cassin**

SEP 2013 - JUN 2016 | **French Baccalaureate | Lycée René Cassin**

## Employment and Volunteering

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**Physics and Maths tutoring | Work | Tutoring London | OCT 2019 - JUL 2023**

Explaining complex topics in a simple and concise manner - requiring enhanced communication skills and adaptability. For students from 11 to 18 years old exclusively from French schools in London.

**Social Secretary for the Womxn in Physics Society | Volunteering | King's College London | SEP 2021 - MAY 2022**

**Highlight:** Instrumental in onboarding the first ever male panelist during the WiP annual conference.

Responsible for planning events for KCL Womxn in Physics. Part of the organisation of the annual conference inviting female physicists across the UK to highlight the importance of women in STEM.

**Retail Assistant | Work | Intersport Outlet, St Pierre d'Irube | JUL 2021 - SEP 2021**

Performed store maintenance, cashier duties, provided customer assistance, and managed inventory replenishment in a sport shop. Required teamwork and communication skills.

**Medical Inventory | Work | Ramsay Clinique Belharra, Bayonne | JUN 2021**

Responsible for overseeing the hospital's inventory, which includes pharmaceuticals and medical supplies. Required organisation and attention to detail. Abundant use of Excel.

**Entrance Health and Safety Officer | Hospital Cleaner | Work | Ramsay Clinique Belharra, Bayonne | MAY 2020 - AUG 2020**

Oversaw COVID-19 entrance protocols at the hospital, including temperature checks, mask enforcement, hand sanitization, and appointment coordination. Also employed as a hospital cleaner, responsible for maintaining a clean and sanitized healthcare environment in compliance with strict hygiene standards.

**Retail Assistant | Work | Pull & Bear, Anglet | JUN 2019 - SEP 2019**

Performed store maintenance, cashier duties, provided customer assistance, and managed inventory replenishment in a clothing retail company. Required teamwork and communication skills.

**Teaching Assistant | Civic Service | Collège Aturri, St Pierre d'Irube | OCT 2018 - JUN 2019**

Collaborated with teachers during mathematics and science lessons, providing specialized support to small groups of students with learning disabilities.

## Projects

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### Flavour Oscillations in the Reissner-Nordström spacetime | Thesis | MAY 2022

**Highlight:** This research contributed novel findings that align with the established scientific literature.

Conducted a research investigation centered on the oscillatory behavior of neutrinos in the vicinity of a charged black hole. Followed by intricate computations to determine the phase discrepancy between different neutrino flavors when two beams underwent gravitational lensing.

### Literature Review on Neutrino Oscillations in Schwarzschild spacetime | Report | OCT 2022 - DEC 2022

Compilation of key discoveries related to neutrino oscillations, encompassing existing knowledge and the outstanding inquiries yet to be resolved. Thorough review of all derivations and calculations were conducted.

### Dark Matter and Cosmic Structure Formation | Report | DEC 2022

Project on cosmological perturbation theory and its role in the formation of large scale structures. Review of the cosmological origin of Primordial Black Holes (PBHs) and examining its mass constraints from the cosmic microwave background (CMB). Generated some original code.

### Investigating the Dirac equation using Supersymmetric Quantum Mechanics (SUSYQM) | Thesis | APR 2022

Investigation of the SUSYQM framework applied to the 1+1 Dirac equation. The project was followed by a detailed analysis of the fractionalisation of charge in a topological soliton field.

## Achievements and Certifications

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SEP 2023 Investment Banking Job Simulation | Bank of America

SEP 2023 Investment Banking Job Simulation | J.P. Morgan

JUNE 2023 Participated in BBC Radio 4's 'The 3rd Degree' podcast | King's College London

MAY 2023 Produced novel research in cosmology as part of my master's thesis | King's College London

## Relevant Courses

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Dark Matter & Dark Energy | King's College London

Strings, Branes and Quantum Gravity | King's College London

Supersymmetry and Conformal Field Theory | King's College London

Quantum Field Theory | King's College London

Standard Model and Beyond | King's College London

General Relativity and Cosmology | King's College London