

# Sebastian Holtedahl Castedo

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## EDUCATION

<b>Ecole Normale Supérieure, FR</b> PhD in Statistical Physics under the supervision of Remi Monasson. Investigating the energetics of computation in natural and artificial neural networks.	Oct 2023 – Sept 2026
<b>The University of Manchester, UK</b> MPhys Physics with Study in Europe. First Class Honours (82%).	Sept 2019 – June 2023
<b>Sorbonne Université, FR</b> Master 1 Physique Fondamentale et Applications. Erasmus exchange programme	Sept 2021 – July 2022
<b>Cardinal Vaughan Memorial School, London, UK</b> A-level: Maths (A*), Further Maths (A), Physics (A), Computer Science (B), AS-History (A).	Sept 2016 – Jun 2018

## SKILLS

**Technical:** Python (incl. Qiskit, Keras, PyTorch, pandas, Scikit-learn), C++, Fortran, R and VB.net/VBA.  
**Language:** Fluent in English, Spanish, Norwegian and French.

## WORK EXPERIENCE

<b>The University of Manchester, UK</b> <i>Master Thesis</i> <ul style="list-style-type: none"><li>Path integral approach to Lotka-Volterra ecosystems with random matrices. Under the supervision of <i>Tobias Galla</i>. Results currently in the process of being published.</li></ul>	Sept 2022 – June 2023
<b>Institute for Cross-Disciplinary Physics and Complex Systems, Palma ES</b> <i>Summer Undergraduate Research Fellowship (SURF)</i> <ul style="list-style-type: none"><li>Developed machine learning models using a variety of tools (VAE, XGBoost, CatBoost) for the prediction and detection of childhood obesity using microbiota data.</li></ul>	Jul 2022 - Aug 2022
<b>Laboratoire de Physique Théorique et Hautes Energies, Paris FR</b> <i>Internship studying the Landau-Lifshitz-Gilbert equation under the supervision of Leticia Cugliandolo</i> <ul style="list-style-type: none"><li>Derived the Langevin equations using a concrete model for the environment giving rise to dissipation &amp; noise and obtained the corresponding Fokker-Planck equation.</li><li>Numerically simulated the evolution of a few such coupled moments.</li><li>This work has recently been published in Phys. Rev. B: <a href="https://arxiv.org/pdf/2205.10418.pdf">https://arxiv.org/pdf/2205.10418.pdf</a></li></ul>	Apr 2022 - Jun 2022
<b>Fermi National Accelerator Laboratory, Chicago US</b> <i>Quantum Computing Internship for Physics Undergraduates</i> <ul style="list-style-type: none"><li>Gained experience programming for existing quantum computers using Python and Qiskit. Covered algorithms including Quantum Fourier Transforms, Grover's Algorithm, and Quantum Phase Estimation.</li><li>Took part in lectures on the fundamentals of quantum mechanics and quantum computing.</li></ul>	Jul 2021

**Slipstream Education, Manchester UK**

Apr 2020 – Sept 2021

*Campus Director*

- Set up and led a charity aimed at bridging the inequality gap in applications to higher education. We provide underprivileged high school students from Manchester with mentors from top universities to assist them with their university applications.
- Set up partnerships with university societies, raised over £5000 in funding and mentored over 50 students.

**Accenture PLC, London UK**

Sept 2018 - May 2019

*Consulting Analyst. Horizons Internship Scheme*

Worked on projects for a large energy player and a UK government entity.

- Coded and launched a visual planning tool used to scope future deployments. It was utilised by a Director General of the Civil Service and was subsequently deployed in five other workstreams.
- Created detailed cutover plans using MS Project and maintained the VSTS work management tool.
- Enabled 6 successful deployments into a test environment by coordinating the delivery of externally facing functionality across multiple suppliers and streams of work.

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**INTERESTS**

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**Social Impact**

- Organising member of a student housing co-operative in Manchester
- Contributed to a pamphlet with the Fabian Society and two Members of Parliament ahead of COP 26.
- Volunteered at a children's orphanage in Bolivia in 2019, helping the children with homework, teaching programming and English in addition to aiding the staff in maintaining the orphanage. Part of a solo 4-month backpacking trip through South America.
- In 2016, fundraised over £3,000 and volunteered for a Cambodian orphanage to help build a new school.

**Music**

- Sing in the University of Manchester choir. Previously sang with the Schola Cantorum performing at venues including Westminster Abbey.
- Obtained Grade 7 trumpet, Grade 5 music theory and Grade 4 piano.

**Sport**

- Part of The University of Manchester's running & karate teams. Ran the London Half Marathon. Taught karate to children for 4 years as a teaching assistant. Represented my borough in the London Youth Games.