Henry Sheehy

September 7, 2025 | Latest: henrysheehy.com/cv
PhD Researcher, Theory of Quantum Materials Group, University of Kent
Founder, QuantaLumin
Tutor, TutorLumin

Employment and experience

- See also teaching.
- **Founder** TutorLumin; Jan 2025–
  Revolutionise Your Learning
  - Educational Technology Platform, STEM Courses and Tuition
  - Teaching school Biology, Chemistry, Physics and Mathematics
- **Founder** QuantaLumin; Jul 2024–
  The System to Simplify Science
  - Platform for Scientific Collaboration and Tools
  - Bespoke Websites Development and Hosting
- **Research assistant** Superconductivity; Mar–Aug 2021
  Created a Unix and Python-based software to simulate superconductors with unconventional pairing mechanisms, such as multiorbital spin-triplet pairing, inhomogeneous lattice geometries, (magnetic) impurities, self-consistently, in the mean-field limit.
  Code documentation available Theories of time-reversal symmetry-breaking superconductors, Physics of Quantum Materials Group, University of Kent; with Dr Jorge Quintanilla
- **Research project** Quantum computing; Aug–Oct 2017
  Tests to determine whether the D-wave quantum computer operates quantum mechanically or classically, with Dr Itay Hen University of Southern California

Education

- **PhD Theoretical Physics** Sep 2018–October 2025
  Physics of Quantum Materials Group (unconventional superconductors); University of Kent
  Thesis (tentative title): *Quasiparticle interference simulation of non-unitary spin-triplet multiorbital superconductivity (supervised by Drs Jorge Quintanilla and Sam Carr)*
- **MSci Joint Honours – First Class** 2014–2018
  Theoretical Physics with Mathematics; Lancaster University
  Thesis: *Quantum discord as a measure of nonlocal correlations in a Majorana-based device (with Dr Alessandro Romito)*
  Exchange year, University of Iowa; with project with *Prof. Craig Pryor: Coarse Graining the Tight-Binding model*; 2016–2017
- **European baccalaureate – 81.75% overall** 2003–2014
  Higher Mathematics 91.0% (with 97.5% in final exam), Advanced Mathematics, Physics 85.3% (95.5% in final exam), Chemistry 81.0%, English 84.2%, French, Philosophy, Geography, History, Laboratory Physics, Physical Education.

Computing-based projects

- **Quantum simulation of unconventional superconductors**
  Code to be published in near-future after scientific publications.
- **Maintain a Linux operating system**
  Streamline technical work (based on Vim principles) and favouring command-line interface.
  Used for research and pedagogical applications.
- **Arduino command-line interface projects**
  Overseeing Arduino projects with precocious school and university students, avoiding use of graphics user-interface and integrated development environments, in favour of command-line, low-level programming.
- **Molecular biophysics simulation with Professor Neil Kad: myofibril bands.**
  Wrote a Python-based software *MyoBand* (see repositories GitHub and Python repository).
- **Stem-cell branching morphogenesis simulation**; Mathematica

Languages

Human

- **English** native, **French** professional proficiency, **Spanish** elementary proficiency, **Portuguese** comprehension, **Mandarin** Personal tuition with Kent Chinese Mandarin School, **Russian** University of Kent Language Express Course 2022–2023.

Machine

Programming philsophy: I enjoy the abstraction and clarity of scripting languages, but am unafraid to speak to the processor.

- **Python** software development for quantum simulation. Deep understanding of **OOP** and robust use of Types. I've custom configured Numpy and PyTorch's BLAS libraries to push the limits of large matrix calculations.
- I *wrote* and manage a **Linux custom Operating System** to accelerate scientific research and study, based on **Vim** philosophy. Personal services across the machine are orchestrated with **runit** scripts, and packages are maintained with **Artix**.
- **BASH** Scripting of Quantum Simulation and Server Administration
- **Web server** hosting, transfer protocols (**HTTPS/SSL**, **SSH**), **Unix** security, frontend (**HTML**, **CSS**, **SASS**, **JS**, **Vue**), backend (**PHP** for forms, **Hugo**, **BASH**, **SQL** admininstation), email self-hosting (**Postfix** & **Dovecot** servers, encryption), Cloud self-hosting. See examples of my websites.
- **LaTeX** with **NeoVim** and **Markdown** (see my notes).
- **kmonad Lisp**: I wrote a custom keyboard to accelerate typing in multiple languages –human, mathematic and code.
- Experience with **Mathematica** (STEM cell research), **Assembly** (for Arduino microcontroller), **Git** (I host a Gitea instance for collaborators and students)
- **Blender**, **Luma AI**, and **Three.js** for 3D model rendering on websites (see canterburyballet.co.uk)
- **R**, **CSV** (Excel) data analysis projects at my Alma Mata.
- **Perl**, **Lua**, **VimScript**, **AWK**, **RegEx**: the Linux rabbit hole.
- **C**, **C++**, **Fortran**, **CUDA**, **Vulkan**, **MakeFiles**. I have experience with low-level languages from Linux System Management, writing an Arduino compiler (ongoing), and understanding the backend of high-level language library kernels.

Volunteering

- **QuantaLumin YouTube Channel** July 2025–
  Popularising and teaching physics; showcasing the Scientific Revolution through the latest stories in Science, Tech and Design
- **Communications and Operations** 2023–2024
  Boxing Club, University of Kent
- **Social Secretary** ; 2022–2023
  Kent Gymnastics Club, University of Kent
- **Social event** Organiser; December 2022
  Physics of Quantum Materials, University of Kent
- **IOP PLANCKS** Marker; 2019; "Physics League Across Numerous Countries for Kick-Ass Students"; Institute of Physics
- **Journal Club** Organiser; 2019–2021
  Physics of Quantum Materials, University of Kent
- **Biophysics Club** Created and Organised; 2019–2020
  Physics of Quantum Materials, University of Kent
- **Unconventional Superconductors: New Paradigms for New Materials**; International Workshop; Assisted with Organisation; Cosener's House, Abingdon, 24-25 September 2018
- **Student Ambassador** Travel abroad; 2017–2018
  Physics Department; Lancaster University
- **Action Damien** Raised Funds for Leprosy and Tuberulosis with classmates from school, culminating in a visit to Action Damin in Pondicherry, India; 2013

Teaching

- **Lead Tutor** July 2025–
  STEM Clinic, TutorLumin West Sussex, United Kingdom
- **Mentor** 2023–2024
  Private Tutoring, Canterbury Subjects: Physics, Mathematics, Chemistry and Biology (GCSE and A-Level)
- **A-level Mentor** 2022–2024
  Subjects: Physics and Biology (A-Level) Outreach, University of Kent
- **Graduate Teaching Assistant** 2018–2023
  Physical Sciences, University of Kent
- **Undergraduate Teaching Assistant** 2016–2017
  Department of Mathematics, University of Iowa
- **Instructor** Computing; 2015
  Camp Monroe, New York

Talks

- **Dialectics of Nature**; Physics of Quantum Materials Journal Club; University of Kent; 2022
- **Multiorbital spin-triplet superconductivity in the SSH model**; Physics of Quantum Materials Discussion Group; University of Kent; 2021
- **Introduction to Branching Morphogenesis**; Physics of Quantum Materials Discussion Group; University of Kent; 2020
- **Time-reversal symmetry breaking in Superconductors**; 3MT, University of Kent; 2019

Posters

- **ExoSup 2022, Cargèse Summer School on Exotic Superconductivity**; From hard-surfaces to soft-clusters: watching Majoranas wither and die; June 2022
- **IOP Condensed Matter and Quantum Materials (CMQM 2021)**; Simulated quasiparticle interference for non-unitary spin-triplet multiorbital superconductivity with impurities; June 2021

Awards

- **Mictacs Globalink** Exchange Scholarship
  Funding for three month exchange at McMaster University, Ontario, Canada. Project: searching for caustics in fermionic systems; 2022.
- **Vice Chancellor's Scholarship** Full PhD Scholarship
  Awarded to outstanding applicants able to demonstrate a high level of academic achievement, excellent communication skills, and the potential to make a strong contribution to their chosen field of research; 2018–2022
- **Autumn School on Correlated Electrons** Forschungszentrum Julich
  Awarded funding for travel, accommodation and attendance; 2019
- **Three Minute Thesis (3MT) Competition** – Second place
  Time-reversal symmetry breaking in superconductors; Prize: Travel and attendance of a conference funding –used towards *Physics by the Lake 2019*; 2019
- **School trip to CERN** Awarded on merit; 2013

Extracurricular

- **Boxing** and **Self-Defence**, University of Kent Boxing Club; 2023–2024
- **Gymnastics** University of Kent Gymnastics Club, Floor, Vault, Rings; 2022–2023
- **Karate** GKR, Yellow belt 2021
- **Rowing** Lancaster University LUBC, University of Kent UKCRC; 2017–2020
- **Diving** Qualified PADI Rescue Diver
- **Rugby** Brussels Celtic RFC, Standard d'Uccle, University of Iowa RC, Lancaster University LU RFC; 2003–2017