# Syed Hussain Haider

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## Education

**Physics with Theoretical Physics BSc**, King's College London, London, UK — Sep 2023 – Present

- **First-Year Coursework:**
  - Established fundamental physics principles, introductory mathematics, computational techniques, essential laboratory skills, and scientific writing proficiency.
- **Second-Year Coursework (Achieved: 80% Overall):**
  - **Experimental Physics:** Implemented advanced laboratory techniques, designed experiments, analyzed data.
  - **Quantum Mechanics:** Explored Schrödinger equation, angular momentum, spin, and Dirac notation.
  - **Electromagnetism:** Applied Maxwell's equations, electromagnetic waves, and vector calculus.
  - **Mathematical Methods for Physics:** Conducted Fourier analysis, solved partial differential equations, utilized integral theorems.
  - **Thermal Physics and Properties of Matter:** Studied thermodynamics, applied statistical mechanics.
  - **Relativity and Sub-Atomic Physics:** Examined nuclear models, analyzed special relativity.
  - **Mathematical Methods for Theoretical Physics:** Investigated Hilbert spaces, formulated Lagrangian and Hamiltonian mechanics.
- **Third-Year Coursework (Ongoing, Predicted: 80%+):**
  - **Statistical Mechanics:** Applied ensemble theory to gases and phase transitions.
  - **Advanced Mathematical Methods for Theoretical Physics:** Developed tensor calculus, complex analysis, variational principles, and Green's functions.
  - **Optics:** Investigated wave propagation, interference, diffraction, and nonlinear optics.
  - **Condensed Matter Physics I:** Studied crystal structures, phonons, band theory, and magnetism.
  - **Quantum Mechanics II:** Explored approximation methods, many-electron atoms, Bose–Einstein condensates, and radiation–matter interaction.
  - **Particle Physics:** Examined the Standard Model, conservation laws, Feynman diagrams, and collider physics.
  - **General Relativity & Cosmology:** Introduced tensor calculus, Einstein's field equations, cosmological models, and black holes.
  - **Third-Year Project in Physics:** Conducting an independent research project involving theoretical, computational, and experimental techniques, assessed through report, oral, and poster presentation.

## Skills

- **Programming:** Python (scientific computing, simulations), MATLAB (numerical analysis)
- **Mathematical Techniques:** Advanced calculus, vector calculus, PDEs, Hilbert spaces
- **Physics Expertise:** Quantum mechanics, relativity, electromagnetism, thermodynamics
- **Experimental Techniques:** Laboratory methods, error propagation, data visualization
- **Documentation and Editing:** LaTeX proficiency, CapCut, KineMaster
- **Photography and Videography:** DSLR camera handling, Lightroom editing
- **Electronics & Instrumentation:** Proficient in handling laboratory instruments such as Helmholtz coils, polarimeters, and GMR sensors, including interpreting analogue outputs and managing precision calibrations.
- **Scientific Communication:** Experienced in crafting accessible scientific content through podcast scripting, detailed lab reporting, and producing engaging science outreach for a community exceeding 25,000 followers.
- **Collaborative Research:** Skilled in effective collaboration and peer-review processes, gained through interdisciplinary projects, academic lab partnerships, and active roles within student-led organizations.
- **Creative Problem-Solving:** Demonstrated ability to approach challenges innovatively across diverse contexts, including multimedia production, design innovation, and complex experimental setups.

## Research and Academic Projects

- **Quantum Mechanics Research Report:** Produced a concise, one-page research document assessing complex numbers in Schrödinger's equation and their relation to physical reality.
- **Magneto Resistance Lab Report:** Conducted comprehensive experimental research on magnetoresistance, evaluated analytical and experimental data.
- **Physics Podcast Project:** Collaboratively developed, scripted, filmed, and edited a video podcast addressing magnetic fields and magnetic levitation.
- **Experimental Physics Laboratories (2023–24):** Conducted rigorous experiments in optics, magnetism, and electronic instrumentation. Executed precise calibrations of polarimeters and Giant Magnetoresistance (GMR) sensors, performed comprehensive data analysis with uncertainty evaluation, and documented findings through professional lab reports utilizing Python for data visualization and LaTeX for presentation.

## Experience

**Producer, Cameraman and Editor**, Little Skits Production May 2020 – Aug 2020

- Produced, filmed, and edited the short film "*The Joy of Giving,*" achieving thousands of views on YouTube.
- Managed comprehensive video production workflows from concept to final editing.
- Assisted with technical and managerial responsibilities.
- Improved multitasking and operational efficiency.

**Founder and Content Creator**, Short.Science (Instagram) 2023 – Present

- Launched and manage an educational platform with over 25,000 followers, including influential figures like Joe Rogan.
- Crafted concise educational content in physics, philosophy, and psychology using AI-generated visuals.

**Intern**, Zoref Clothing Brand, London, UK Dec 2023 – Jan 2024

- Actively contributed to innovative design processes and concept development for new collections, demonstrating aesthetic insight and collaborative creativity.
- Participated in iterative feedback sessions to refine product designs, rapidly incorporating critiques and effectively communicating adjustments across teams.
- Enhanced creative problem-solving and teamwork skills by navigating dynamic deadlines and diverse responsibilities within a collaborative environment.

**O-Level Maths and Physics Tutor**, Axis Tuition Center, London, UK Nov 2024 – Jan 2025

- Delivered targeted instruction in mathematics and physics to O-Level students.
- Developed and implemented effective lesson plans, enhancing student understanding and performance.

## Volunteer and Leadership Experience

- Volunteered actively in community feeding programs, directly impacting underprivileged communities.
- Facilitated and led educational workshops for local students, demonstrating strong leadership and organizational capabilities.
- Committee Member of the Quantum Mechanics Society at King's College London; nominated for Vice President position for the upcoming academic year.

## Interests

- Intellectual exploration of physics, philosophy, and historical perspectives.
- Enjoying strategic games to enhance problem-solving abilities, analytical thinking, and tactical decision-making.
- Staying updated on advancements in scientific research and emerging technologies.
- Gym training, powerlifting, and personal health improvement.

## Languages

- English, Urdu, Hindi