

# Coleridge Faraday

✉ [frdcol002@myuct.ac.za](mailto:frdcol002@myuct.ac.za) • [coleridgefaraday.com](https://coleridgefaraday.com)

ORCID [0000-0003-3063-148X](https://orcid.org/0000-0003-3063-148X) • iN 2661508 • Last updated on June 3, 2025

## Education

<b>PhD. in Physics</b> , <i>University of Cape Town</i> Supervisor: Assoc. Prof. W. A. Horowitz	2025 – Present
<b>MSc with Distinction in Physics</b> , <i>University of Cape Town</i> (90%) Thesis: <i>Energy Loss and Theoretical Uncertainties in Small Quark-Gluon Plasmas</i> Supervisor: Assoc. Prof. W. A. Horowitz	2023 – 2024
<b>Honours in Physics</b> , <i>University of Cape Town</i> (85%) Thesis: <i>Investigating the short path length corrections to jet phenomenology in heavy ion collisions</i> Supervisor: Assoc. Prof. W. A. Horowitz	2022
<b>BSc in Physics and Mathematics</b> , <i>University of Cape Town</i> (81%) Supervisor: Assoc. Prof. Heribert Weigert Project title: <i>Spontaneous symmetry breaking and the Higgs mechanism.</i>	2019–2021

## Awards

National Institute for Theoretical and Computational Sciences (NITHECS) Scholarship	2025 – 2027
Science Faculty PhD Fellowship, <i>University of Cape Town</i>	2025 – 2027
Manuel & Luby Washkansky Scholarship, <i>University of Cape Town</i>	2023
SA-CERN Excellence Scholarship	2023 – 2024
Science Faculty Scholarship, <i>University of Cape Town</i>	2020
Science Faculty Entrance Scholarship, <i>University of Cape Town</i>	2019
Dean's Merit List, <i>University of Cape Town</i>	2019, 2021, *
UCT Mathematics Olympiad Gold Award	2015, 2016
Professor John Webb Mathematics Scholarship, <i>Wynberg Boys' High School</i>	2014 – 2018

## Publications

### Journal Articles

- [1] **Faraday, C. & Horowitz, W. A. May 2025.** Collisional and radiative energy loss in small systems. *Phys. Rev. C* **111**, 054911. doi:[10.1103/PhysRevC.111.054911](https://doi.org/10.1103/PhysRevC.111.054911). arXiv: [2408.14426](https://arxiv.org/abs/2408.14426) [[nucl-th](#)]. **2025**
- [2] **Faraday, C. & Horowitz, W. A. May 2025.** Statistical analysis of pQCD energy loss across system size, flavor,  $\sqrt{s_{NN}}$ , and  $p_T$ . *Submitted to JHEP*. arXiv: [2505.14568](https://arxiv.org/abs/2505.14568) [[hep-ph](#)].
- [3] **Faraday, C. & Horowitz, W. A. Mar. 2025.** A unified description of small, peripheral, and large system suppression data from pQCD. *Phys. Lett. B* **864**, 139437. doi:[10.1016/j.physletb.2025.139437](https://doi.org/10.1016/j.physletb.2025.139437). arXiv: [2411.09647](https://arxiv.org/abs/2411.09647) [[hep-ph](#)].
- [4] **Faraday, C., Grindrod, A. & Horowitz, W. A. Nov. 2023.** Inconsistencies in, and short pathlength correction to,  $R_{AA}(p_T)$  in A + A and p + A collisions. *Eur. Phys. J. C* **83**, 1060. doi:[10.1140/epjc/s10052-023-12234-y](https://doi.org/10.1140/epjc/s10052-023-12234-y). arXiv: [2305.13182](https://arxiv.org/abs/2305.13182) [[hep-ph](#)]. **2023**

\*No awards were given in 2020 due to the COVID-19 pandemic

## Conference Papers.....

- [1] **Faraday, C. & Horowitz, W. A. Jan. 2025.** *Heavy Flavour Energy Loss in Small and Large Systems* in. **316.** 2025 Contribution to SQM2024 (Jan. ), 04001. doi:[10.1051/epjconf/202531604001](https://doi.org/10.1051/epjconf/202531604001). arXiv: [2409.14886](https://arxiv.org/abs/2409.14886) [[nucl-th](#)].
- [2] Bert, B., **Faraday, C. & Horowitz, W. A. Dec. 2024.** *Modeling the Geometry of the Quark Gluon Plasma* in. Contribution to SAIP 2024 (Dec. ), 618–623. ISBN: 978-1-0370-2645-4. <https://www.coleridgefaraday.com/assets/pdf/papers/saipBert2024.pdf>. **2024**
- [3] **Faraday, C. & Horowitz, W. A. Dec. 2024.** *Energy Loss in Small Quark Gluon Plasmas* in. Contribution to SAIP 2024 (Dec. ), 629–634. ISBN: 978-1-0370-2645-4. <https://www.coleridgefaraday.com/assets/pdf/papers/saipFaraday2024.pdf>.
- [4] **Faraday, C. & Horowitz, W. A. June 2024.** *High- $p_T$  suppression in small systems* in. **296.** Contribution to Quark Matter 2023 (June ), 12011. doi:[10.1051/epjconf/202429612011](https://doi.org/10.1051/epjconf/202429612011). arXiv: [2312.10712](https://arxiv.org/abs/2312.10712) [[hep-ph](#)].
- [5] **Faraday, C. & Horowitz, W. Feb. 2024.** *Energy Loss in Small Collision Systems* in. **HardProbes2023.** Contribution to Hard Probes 2023 (Feb. ), 131. doi:[10.22323/1.438.0131](https://doi.org/10.22323/1.438.0131). arXiv: [2307.08355](https://arxiv.org/abs/2307.08355) [[nucl-th](#)].
- [6] **Faraday, C. & Horowitz, W. A. Sept. 2023.** *Assumption Breakdown in Radiative Energy Loss* in *67th Annual Conference of the South African Institute of Physics* Contribution to SAIP 2023 (Sept. ). arXiv: [2309.06246](https://arxiv.org/abs/2309.06246) [[hep-ph](#)]. **2023**

## Theses.....

- [1] **Faraday, C. Dec. 2024.** *Energy Loss and Theoretical Uncertainties in Small Quark-Gluon Plasmas* M.Sc. **2024** thesis (University of Cape Town, South Africa, Dec. ). [https://www.coleridgefaraday.com/assets/pdf/papers/MSc\\_ColeridgeFaraday.pdf](https://www.coleridgefaraday.com/assets/pdf/papers/MSc_ColeridgeFaraday.pdf).

## Talks and Posters

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Slides for my major presentations are available [here](#) under a CC-BY license.

### Conference Talks.....

- [1] **Faraday, C. July 2024.** *Energy Loss in Small Quark Gluon Plasmas* 68th Annual Conference of the South African Institute of Physics (SAIP 2024). Makhanda, South Africa, July.
- [2] **Faraday, C. June 2024.** *Heavy Flavour Energy Loss in Small and Large Systems* The 21st International Conference on Strangeness in Quark Matter (SQM 2024). Strasbourg, France, June.
- [3] **Faraday, C. Sept. 2023.** *High- $p_T$  suppression in small systems* 30th International Conference on Ultrarelativistic Nucleus-Nucleus Collisions (Quark Matter 2023). Houston, Texas, USA, Sept. **2023**
- [4] **Faraday, C. July 2023.** *Short path length corrections to pQCD phenomenological energy loss models in a QGP* 67th Annual Conference of the South African Institute of Physics (SAIP 2023). Richard's Bay, South Africa, July.

### Conference Posters.....

- [1] **Faraday, C. Apr. 2025.** *Data-Driven Predictions for Small System Energy Loss* Quark Matter 2025. **2025** Goethe University Frankfurt: Quark Matter 2025, Apr.

## Outreach Talks.....

- [1] **Faraday, C. May 2025.** *Smashing Atoms to Rewind the Universe* The University of Cape Town's Society of Physics Students. Cape Town, South Africa, May.
- [2] **Faraday, C. Oct. 2024.** *Racing Balls* Phenomenal physics (high school outreach). Cape Town, South Africa: University of Cape Town, Oct. **2024**
- [3] **Faraday, C. Sept. 2024.** *Introduction to Heavy-Ion Physics* Outreach trip to University of Venda. Thohoyandou, South Africa: University of Venda, Sept.
- [4] **Faraday, C. Nov. 2023.** *Quark Gluon Plasma Formation in Small Systems* ATLAS Showcase, UCT-CERN relaunch. Cape Town, South Africa, Nov. **2023**
- [5] **Faraday, C. Oct. 2023.** *Probing the Early Universe with Extreme Temperature Physics* Postgraduate Showcase 2023. Cape Town, South Africa: University of Cape Town, Oct.

## Academic Service

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Postgraduate representative for Physics Department, University of Cape Town 2025 – Present

## Reviewing.....

Proceedings of the 68th Annual Conference of the South African Institute of Physics

## Teaching

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<b>Quantum Field Theory II (SATACS)</b> , Tutor	2025
<b>Quantum Field Theory I (SATACS)</b> , Tutor	2024
<b>Honours Statistical Physics (UCT)</b> , Tutor	2024
<b>Honours Quantum Mechanics (UCT)</b> , Tutor	2023, 2024
<b>Third Year Statistical Physics (UCT)</b> , Tutor	2023
<b>First Year Physics (with lab) (UCT)</b> , Tutor	2022
<b>High School Physics, Mathematics, Chemistry, and Computer Science (Chit-Chat Tutoring)</b> , Private Tutor	2019–2022

## Mentorship roles

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<b>Ben Bert.</b> Mentoring and helping with honours and MSc projects on phenomenological energy loss at UCT	2023 – Present
<b>Tiaan van der Merwe.</b> Mentoring and helping with honours project on phenomenological energy loss at UCT	2024 – Present