

# Coleridge Faraday

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## Education

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

## Awards

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

## Publications

### Journal Articles.....

- [1] **Faraday, C. & Horowitz, W. A. May 2025.** Statistical analysis of pQCD energy loss across system size, 2025 flavor,  $\sqrt{s_{NN}}$ , and  $p_T$ . *Submitted to JHEP*. arXiv: [2505.14568 \[hep-ph\]](#).
- [2] **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](#). arXiv: [2408.14426 \[nucl-th\]](#).
- [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](#). arXiv: [2411.09647 \[hep-ph\]](#).
- [4] **Faraday, C., Grindrod, A. & Horowitz, W. A. Nov. 2023.** Inconsistencies in, and short pathlength 2023 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](#). arXiv: [2305.13182 \[hep-ph\]](#).

\*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* 2024 in *68th Annual Conference of the South African Institute of Physics* Contribution to SAIP 2024 (Dec. ), 618–623. ISBN: 978-1-0370-2645-4. <https://www.coleridgefaraday.com/assets/pdf/papers/saipBert2024.pdf>.
- [3] **Faraday, C. & Horowitz, W. A. Dec. 2024.** *Energy Loss in Small Quark Gluon Plasmas* in *68th Annual Conference of the South African Institute of Physics* 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](#)].

## Theses.....

- [1] **Faraday, C. Dec. 2024.** *Energy loss and theoretical uncertainties in small quark-gluon plasmas* Other 2024 thesis (Dec. ). arXiv: [2506.02056](https://arxiv.org/abs/2506.02056) [[hep-ph](#)].

## 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 2023 relaunch. Cape Town, South Africa, Nov.
- [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

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

<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 laboratory) (UCT)</b> , Tutor	2022
<b>High School Physics, Mathematics, Chemistry, and Computer Science</b> (Chit-Chat Tutoring), Private Tutor	2019–2022

## Mentorship roles

<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