

Matt LeBlanc, Ph.D.

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RESEARCH IN EXPERIMENTAL HIGH-ENERGY PHYSICS

2024 – Present **CMS Collaboration** signing author since 2025

2010 – 2023 **ATLAS Collaboration** signing author 2015–2024

- Precision jet and jet substructure cross-section measurements.
- AI/ML, optimal transport and scientific computing for collider physics.
- Hadronic object reconstruction, calibration and classification at the LHC and for a 10 TeV muon collider concept.
- Searches for dark matter & new phenomena in hadronic final states.

POSITIONS

Jan 2024 – Present **Brown University** Providence, Rhode Island, USA
Assistant Professor of Physics (Research)

- Affiliate: NSF Institute for Artificial Intelligence & Fundamental Interactions (IAIFI).
- Affiliate: Brown University Data Science Institute (DSI).

Apr – Dec 2023 **University of Manchester** Manchester, England, UK
Postdoctoral Research Associate

Jan 2021 – Mar 2023 **CERN** Meyrin, Geneva, Switzerland
Senior Research Fellow

Jul 2017 – Dec 2020 **University of Arizona** Tucson, Arizona, USA
Postdoctoral Research Associate

EDUCATION

2011 – 2017 **University of Victoria** Victoria, British Columbia, Canada
Ph.D., Experimental Particle Physics

- Advisor: Rob McPherson (IPP / University of Victoria).

2007 – 2011 **Acadia University** Wolfville, Nova Scotia, Canada
B.Sc.(H.), Physics & Mathematics

- Advisors: Anadi Canepa (Fermilab); Svetlana Barkanova (Memorial University).

GRANTS

Research

- 2026 – 2027 US CMS HL-LHC Software and Computing R&D Award (PI). **\$47k**
- 2026 – 2027 Brown University Data Science Institute Collaborative Grant (Co-PI, w/ PI R. Gaitskell, G. Barone, I. Dell’Antonio, J. Pober and J. Roloff), *BEACON: Brown’s Efficient AI Compression Network*. **\$30k**
- 2025 – 2027 US Department of Energy, Office of High Energy Physics Comparative Review Funding Award (PI, w/ Co-PI J. Roloff), *Computational Advances to Enable Precision Physics at the HL-LHC*. **\$600k**
- 2024 – 2025 Brown University Data Science Institute Seed Grant (PI, w/ J. Roloff), *Staying positive: eliminating negative sample weights using optimal transport*. **\$25k**

Course development

Brown University Zern Fund for STEM, *Fabry–Perot Interferometers for physics instructional lab experiments*. **\$5k**

AWARDS

- 2025 **Breakthrough Prize in Fundamental Physics**
- For my contributions to the ATLAS Experiment during Run 2 of the LHC at CERN.
- 2022 **Wu-Ki Tung Award for Early-Career Research in QCD**, CTEQ Collaboration
- *Citation:* “For important contributions to the measurements of QCD dynamics using jets and jet substructure, as well as for long standing contributions and leadership in jet reconstruction and calibration.”
- 2014–2017 **NSERC** — Postgraduate Scholarship, Doctoral
- 2012–2017 **University of Victoria** — President’s Research Scholarship
- 2012–2013 **NSERC** — Alexander Graham Bell Canada Graduate Scholarship
- 2011–2012 **University of Victoria** — Fellowship
- 2010 **TRIUMF** — Summer Student Award, Atlantic Region
- 2010 **NSERC** — Undergraduate Summer Research Award (Declined)

LEADERSHIP IN EXPERIMENTAL COLLABORATIONS

CMS Collaboration — Member 2024 – Present

- 2025 – Pres. L3 Convener, MC Generators — Physics Modeling and Validation Subgroup.
- 2025 – Pres. MC Contact Person, Jets & Missing Energy Group.

US Muon Collider Collaboration (USMCC) — Member 2024 – Present

- 2026 – Pres. Deputy Experimental Community Representative.

■ **ATLAS Collaboration** — Member 2010 – 2024, Signing Author 2015 – 2024

- 2022 – 2023 Physics Coordination, ex officio member (Jet/EtMiss Convenership).
- 2022 – 2023 Jet/EtMiss Combined Performance Group Convener — coordinated ~200 physicists across five subgroups.
- 2020 – 2022 Subgroup Convener, Standard Model Jet & Photon Physics — ~15 physics measurements.
- 2019 – 2020 Subgroup Convener, Jet/EtMiss Definitions & MC Calibrations — ~30 researchers.
- 2018 – 2019 Subgroup Convener, Jet/EtMiss Jet Energy Scale & Resolution — ~80 scientists.
- 2018 – 2022 Shift Leader, ATLAS Control Room — Run 2, 3 pp and Pb+Pb data-taking & pilot-beam operations.
- 2017 – 2021 Coordinator, core software ('Athena') code review shifts.
- 2017 – 2020 Liaison between the Jet/EtMiss and Supersymmetry Groups.
- 2015 Calo/Forward Detector Shifter, ATLAS Control Room — Run 2 pp data-taking.

PUBLICATIONS AND PRELIMINARY RESULTS

- Author of over 972 peer-reviewed results since 2015 as a member of large high-energy physics collaborations; those below are selected for a significant, personal contribution.
- A *Contact Editor* coordinates the analysis team and prepares the manuscript for publication.

■ **Peer-reviewed publications & proceedings**

28 **Measurement of 4-point energy correlator projections in Z+jets events.**

CMS Collaboration · Preliminary result (PRD)

[CMS-SMP-25-009](#)

27 **Optimal-Transport-Based Cell Resampling for Negative and Pathological Event Weights.**

R. Doherty, L. Hay, M. LeBlanc, C. Mauceri, J. Marrinan, R. Jain & J. Roloff · In preparation (JHEP)

[arXiv:2607.08723](#) · [InspireHEP](#)

26 **Evidence for the dead-cone effect in bottom quark initiated jets.**

CMS Collaboration · Submitted to PRL

[arXiv:2608.29412](#) · [CMS-SMP-25-008](#) · [InspireHEP](#)

25 **Massive tree-level splitting functions beyond kinematical limits.**

S. Höche, M. LeBlanc, J. Roloff & G. Whitman · PRD 113 (2026) 054009, 3 citations

[arXiv:2512.07025](#) · [InspireHEP](#)

24 **The Pareto frontier of resilient jet tagging.**

R. Gambhir, M. LeBlanc & Y. Zhou · NeurIPS 2025 Machine Learning & the Physical Sciences (ML4PS) Workshop, 8 citations

[arXiv:2509.19431](#) · [InspireHEP](#)

23 **Measurement of Jet Track Functions in ATLAS Run 2 Data.**

ATLAS Collaboration · PLB 868 (2025) 139680, 26 citations

[arXiv:2502.02062](#) · [ATLAS-STD-2022-05](#) · [InspireHEP](#)

- *Theory associate (STA)*: Ian Mould (Yale).
- *Main analyzer*.

- 22 **A Field Guide to Event-Shape Observables Using Optimal Transport.**
C. Cesarotti & M. LeBlanc · Accepted, JHEP, 7 citations
[arXiv:2409.13150](#) · [InspireHEP](#)
- 21 **A precise measurement of the jet energy scale derived from single-particle measurements and in situ techniques in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector.**
ATLAS Collaboration · Submitted to EPJC, 14 citations
[arXiv:2407.15627](#) · [ATLAS-JETM-2022-06](#) · [InspireHEP](#)
▪ *Technical contribution.*
- 20 **Measurements of jet cross-section ratios in 13 TeV proton–proton collisions with ATLAS.**
ATLAS Collaboration · PRD 110 (2024) 072019, 32 citations
[arXiv:2405.20206](#) · [ATLAS-STDm-2020-04](#) · [InspireHEP](#)
▪ *Contact editor & main analyzer.*
- 19 **Measurements of Lund subjet multiplicities in 13 TeV proton-proton collisions with the ATLAS detector.**
ATLAS Collaboration · PLB 859 (2024) 139090, 16 citations
[arXiv:2402.13052](#) · [ATLAS-STDm-2023-07](#) · [InspireHEP](#)
▪ *Contact editor & main analyzer.*
- 18 **Pursuit of paired dijet resonances in the Run 2 dataset with the ATLAS detector.**
ATLAS Collaboration · PRD 108 (2023) 112005, 28 citations
[arXiv:2307.14944](#) · [ATLAS-EXOT-2022-18](#) · [InspireHEP](#)
▪ *Contact editor & main analyzer.*
- 17 **Going off topics to demix quarks and gluons in extractions of α_S .**
M. LeBlanc, B. Nachman & C. Sauer · JHEP 02 (2023) 150, 10 citations
[arXiv:2206.10642](#) · [InspireHEP](#)
- 16 **Measurements of multijet event isotropies using optimal transport with ATLAS.**
ATLAS Collaboration · JHEP 10 (2023) 060, 24 citations
[arXiv:2305.16930](#) · [InspireHEP](#)
▪ *Contact editor & main analyzer.*
▪ *Theory associate (STA):* Cari Cesarotti (MIT).
▪ *ATLAS physics briefing:* Giving collisions a new shape: New ATLAS result measures isotropy of LHC events.
- 15 **New techniques for jet calibration with the ATLAS detector.**
ATLAS Collaboration · EPJC 83 (2023) 761, 66 citations
[arXiv:2303.17312](#) · [ATLAS-JETM-2022-01](#) · [InspireHEP](#)
▪ *ATLAS physics briefing:* Signal and noise: how timing measurements and AI are improving ATLAS event reconstruction.
- 14 **Jets and Jet Substructure at Future Colliders.**
B. Nachman, S. Rappoccio, N. Tran (eds.) *et al.* · Front. Phys. 10 (2022), 30 citations
[arXiv:2203.07462](#) · [InspireHEP](#)

- 13 **Optimisation of large-radius jet reconstruction for the ATLAS detector in 13 TeV proton-proton collisions.**
 ATLAS Collaboration · EPJC 81 (2021) 334, 145 citations
 arXiv:2009.04986 · ATLAS-JETM-2018-06 · InspireHEP
 ▪ *Contact editor & main analyzer.*
- 12 **Jet energy scale and resolution measured in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector.**
 ATLAS Collaboration · EPJC 81 (2021) 689, 927 citations
 arXiv:2007.02645 · ATLAS-JETM-2018-05 · InspireHEP
- 11 **Measurement of the Lund Jet Plane with charged particles in 13 TeV pp collisions with the ATLAS detector.**
 ATLAS Collaboration · PRL 124 (2020) 222002, 131 citations
 arXiv:2004.03540 · ATLAS-STDm-2018-57 · InspireHEP
 ▪ *Contact editor & main analyzer.*
 ▪ *ATLAS physics briefing: Novel probes of the strong force: precision jet substructure and the Lund jet plane.*
- 10 **A measurement of soft-drop jet observables in pp collisions with the ATLAS detector at $\sqrt{s} = 13$ TeV.**
 ATLAS Collaboration · PRD 101 (2020) 052007, 139 citations
 arXiv:1912.09837 · ATLAS-STDm-2017-33 · InspireHEP
 ▪ *Main analyzer.*
 ▪ *ATLAS physics briefing: Novel probes of the strong force: precision jet substructure and the Lund jet plane.*
- 9 **Constraints on mediator-based dark matter models using $\sqrt{s} = 13$ TeV pp collisions at the LHC with the ATLAS detector.**
 ATLAS Collaboration · JHEP 05 (2019) 142, 190 citations
 arXiv:1903.01400 · ATLAS-EXOT-2017-32 · InspireHEP
- 8 **Combination of the searches for pair-produced vector-like partners of the third-generation quarks at $\sqrt{s} = 13$ TeV with the ATLAS detector.**
 ATLAS Collaboration · PRL 121 (2018) 211801, 307 citations
 arXiv:1808.02343 · ATLAS-EXOT-2017-17 · InspireHEP
 ▪ ★ *Editor's Suggestion*, Physical Review Letters.
 ▪ *CERN press statement: The incredible lightness of the Higgs* (Français).
 ▪ *ATLAS physics briefing: Could a new type of quark fix the “unnaturalness” of the Standard Model?*
- 7 **Search for new phenomena in events with same-charge leptons and b-jets in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector.**
 ATLAS Collaboration · JHEP 12 (2018) 039, 203 citations
 arXiv:1807.11883 · ATLAS-EXOT-2016-16 · InspireHEP
- 6 **In situ calibration of large-radius jet energy and mass in 13 TeV proton-proton collisions with the ATLAS detector.**
 ATLAS Collaboration · EPJC 79 (2019) 135, 227 citations

[arXiv:1807.09477](#) · [ATLAS-JETM-2018-02](#) · [InspireHEP](#)

- *Contact editor.*
- *CERN Courier: A decade of advances in jet substructure* (28 Sept 2018).

5 Search for Supersymmetry in final states with missing transverse momentum and multiple b-jets in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector.

ATLAS Collaboration · JHEP 06 (2017) 107, [101](#) citations

[arXiv:1711.01901](#) · [ATLAS-SUSY-2016-10](#) · [InspireHEP](#)

4 Identification of high transverse momentum top quarks in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector.

ATLAS Collaboration · JHEP 06 (2016) 093, [84](#) citations

[arXiv:1603.03127](#) · [ATLAS-PERF-2015-04](#) · [InspireHEP](#)

- *ATLAS physics briefing: ATLAS ready to “boost” Run 2 physics.*

3 Search for pair production of gluinos decaying via stop and sbottom in events with b-jets and large missing transverse momentum in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector.

ATLAS Collaboration · PRD 94 (2016) 032003, [94](#) citations

[arXiv:1605.09318](#) · [ATLAS-SUSY-2015-10](#) · [InspireHEP](#)

2 The evolution of cloud computing in ATLAS.

R. P. Taylor *et al.* · J. Phys. Conf. Ser. 664 (2015), CHEP 2015 Okinawa

1 Search for direct pair production of the top squark in all-hadronic final states in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector.

ATLAS Collaboration · JHEP 09 (2014) 015, [192](#) citations

[arXiv:1406.1122](#) · [ATLAS-SUSY-2013-16](#) · [InspireHEP](#)

Hardware-related results

12 Depletion depth studies with the MALTA2 sensor, a depleted monolithic active pixel sensor.

D. V. Berlea *et al.* · NIM A 1063 (2024) 169262, Proc. HSTD13

11 Future developments of radiation tolerant sensors based on the MALTA architecture.

D. Dobrijević *et al.* · JINST 18 (2023) C03013, Proc. TWEPP-22

10 Development of a large-area, light-weight module using the MALTA monolithic pixel detector.

F. Dachs *et al.* · NIM A 1047 (2023) 167809, Proc. PM2021

9 Performance of the MALTA telescope.

M. van Rijnbach *et al.* · EPJC 83 (2023) 581, [18](#) citations

[arXiv:2304.01104](#) · [InspireHEP](#)

8 MALTA-Cz: A radiation hard full-size monolithic CMOS sensor with small electrodes on high-resistivity Czochralski substrate.

H. Pernegger *et al.* · JINST 18 (2023) P09018, [18](#) citations

[arXiv:2301.03912](#) · [InspireHEP](#)

- 7 **MALTA monolithic pixel sensors in TowerJazz 180 nm technology.**
C. Solans Sánchez *et al.* · NIM A 1057 (2023) 168787, Proc. VERTEX2021
- 6 **Radiation Hardness of MALTA2, a Monolithic Active Pixel Sensor for Tracking Applications.**
D. V. Berlea *et al.* · IEEE TNS 70 (2023) 2303
- 5 **Recent results with radiation-tolerant TowerJazz 180 nm MALTA Sensors.**
M. LeBlanc *et al.* · NIM A 1041 (2022) 167390, Proc. VCI2022, 1 citation
[arXiv:2209.04459](#) · [InspireHEP](#)
- 4 **MALTA3: Concepts for a new radiation tolerant sensor in the TowerJazz 180 nm technology.**
D. Dobrijević *et al.* · NIM A 1040 (2022) 167226, Proc. VCI2022
- 3 **A 1 μ W radiation-hard front-end in a 0.18 μ m CMOS process for the MALTA2 monolithic sensor.**
F. Piro *et al.* · IEEE TNS 69 (2022) 1299
- 2 **Timing performance of radiation-hard MALTA monolithic pixel sensors.**
G. Gustavino *et al.* · JINST 18 (2022) C0301, Proc. IWORID 2022, 10 citations
[arXiv:2209.14676](#) · [InspireHEP](#)
- 1 **Radiation hardness and timing performance in MALTA monolithic pixel sensors in TowerJazz 180 nm.**
M. van Rijnbach *et al.* · JINST 17 (2022) C04034, Proc. TWEPP21

Other publications, proceedings & white papers

- 7 **The Future of Artificial Intelligence and the Mathematical and Physical Sciences.**
A. Ferguson, M. LaFleur, L. Ruthotto, J. Thaler, Y.-S. Ting, P. Tiwary, S. Villar (eds.) *et al.* · Community paper, Future of NSF AI+MPS Workshop (2025)
[arXiv:2509.02661](#)
- 6 **Les Houches 2023: Physics at TeV Colliders — Standard Model Working Group Report.**
M. Donegà, S. Jones, K. Köneke, R. Röntsch, S. Höche, J. McFayden, V. Mikuni, S. Plätzer *et al.* · Proc. Les Houches 2023, 40 citations
[arXiv:2406.00708](#) · [InspireHEP](#)
- 5 **Jet and photon physics in ATLAS and CMS.**
M. LeBlanc, on behalf of the ATLAS and CMS Collaborations · Proc. Rencontres de Moriond QCD (2022)
ATL-PHYS-PROC-2022-049
- 4 **Measurements of event shapes and jet substructure with ATLAS Run 2 data.**
M. LeBlanc, on behalf of the ATLAS Collaboration · PoS LHCP2020 (2021) 144
ATL-PHYS-PROC-2020-047
- 3 **Les Houches 2019: Physics at TeV Colliders — Standard Model Working Group Report.**
D. De Florian, M. Donegà, M. Dührssen-Debling, S. Jones, A. Huss, J. Huston, S. Kallweit, D. Maître, S. Marzani, B. Nachman, S. Prestel, E. Re *et al.* · Proc. Les Houches 2019, 194 citations
[arXiv:2003.01700](#) · [InspireHEP](#)

2 **Inclusive searches for squarks and gluinos with the ATLAS detector.**

M. LeBlanc, on behalf of the ATLAS Collaboration · PoS DIS2018 (2018) 078

ATL-PHYS-PROC-2018-080

1 **Imaging of Electron Trajectories in Crystals.**

M. LeBlanc & M. D. Robertson · Bull. Soc. Microsc. Can. 37 (2009) 20

Public notes & figures

Released publicly by the ATLAS Collaboration after internal review.

16 **Constituent-based W-boson tagging with the ATLAS Detector.**

ATL-PHYS-PUB-2023-020 · Public note · July 2023

- *ATLAS physics briefing: Machine learning is revolutionising our understanding of particle “jets”.*

15 **Summary plots: anti- k_t R=0.4 precision jet energy scale uncertainty (Rel. 21).**

JETM-2023-005 · Public plots · November 2023

14 **LAr Cells in Clusters with Timing.**

LARG-2023-05 · Public plots · July 2023

13 **Comparison of W tagging performance with different ML algorithms.**

JETM-2023-003 · Public plots · July 2023

12 **Towards a precise interpretation of the top quark mass parameter in ATLAS Monte Carlo samples.**

ATL-PHYS-PUB-2021-034 · Public note · July 2021

- *Contact editor.*

11 **Identification of hadronically-decaying top quarks using UFO jets with ATLAS in Run 2.**

ATL-PHYS-PUB-2021-028 · Public note (Prelim.) · July 2021

10 **E/p measurements and Geant4 physics list comparisons.**

JETM-2020-03 · Public plots · November 2020

9 **Impact of Alternative Inputs and Jet Grooming on Large-R Jet Performance.**

ATL-PHYS-PUB-2019-027 · Public note (Prelim.) · July 2019

- *Contact editor.*

8 **In situ large-R jet energy scale calibration and uncertainties in 2015-2017 data.**

JETM-2019-05 · Public plots · July 2019

7 **Particle flow jet energy scale in 2015-2017 data and simulation.**

JETM-2019-02 · Public plots · February 2019

6 **Particle flow jet energy resolution in 2017 data and simulation.**

JETM-2019-01 · Public plots · February 2019

5 **Impact of Pile-up on Jet Constituent Multiplicity in ATLAS.**

ATL-PHYS-PUB-2018-011 · Public note (Prelim.) · July 2018

4 **Jet energy scale and uncertainties in 2015-2017 data and simulation.**

JETM-2018-006 · Public plots · November 2018

3 **Jet energy resolution in 2017 data and simulation.**

JETM-2018-005 · Public plots · September 2018

2 Jet reclustering and close-by effects in ATLAS Run 2.

ATLAS-CONF-2017-062 · Conf. note, BOOST 2017 · July 2017

▪ *Contact editor.*

1 Stability of jet mass for top, W, and light jets as a function of pile-up.

JETM-2016-014 · Public plots · December 2016

PUBLIC DATASETS

2026 MadGraph5_aMC@NLO + Pythia 8.3 event samples for cell resampling studies (13 TeV, Z+jets and top quark pair production).

Maintainer, with R. Doherty, L. Hay, R. Jain, J. Marrinan, C. Mauceri & J. Roloff · [Zenodo](#)

Pythia8 Quark and Gluon Jets (quantized floats).

Maintainer, with N. DiLullo · [Zenodo](#), in three precisions: [Float8 \(e4m3FN\)](#) · [Float16](#) · [Float32](#)

2025 Pythia8 and Herwig7 Boosted Top and QCD Datasets.

Maintainer, with R. Gambhir & Y. Zhou · [Zenodo](#)

OPEN-SOURCE SOFTWARE

2025 – Pres. **JetReconstruction.jl** — Jet reconstruction (reclustering) with Julia. Developer · [JuliaHEP/JetReconstruction.jl](#)

2025 – Pres. **JetTaggingFCC.jl** — AI algorithms for jet tagging at the Future Circular Collider with Julia. Maintainer · [JuliaHEP/JetTaggingFCC.jl](#)

2025 – Pres. **EnergyFlow.jl** — Optimal transport for collider physics with Julia. Owner · [leblanc-lab/EnergyFlow.jl](#) · [Zenodo](#)

Athena — Core software framework of the ATLAS Collaboration. Developer · [gitlab.cern.ch/atlas/athena](#) · [doi:10.5281/zenodo.2641997](#)

IDTrackSel — Simple wrappers around ATLAS track selection tools. Owner · [mattleblanc/IDTrackSel](#)

2015 – 2022 **xAODAnaHelpers v1.0.0** — ATLAS Run II analysis framework for AnalysisTop and AnalysisBase. Developer · [UCATLAS/xAODAnaHelpers](#)

LHC — A physics-y clone of 1024. Owner · [mattleblanc/LHC](#)

RESEARCH PRESENTATIONS

Plenary and invited talks

27 Physics Innovation via Optimal Transport.

(Accepted) Workshop at the NSF Institute for Pure and Applied Mathematics, UCLA, USA. March 1–5, 2027. Plenary.

26 Designing a Muon Collider Detector.

(Accepted) 2026 Annual US Muon Collider Collaboration Meeting, Stanford University, USA. 13–16 December 2026. Plenary.

- 25 **High-scale QCD physics.**
(Accepted) 16th Edition of QCD@LHC, Oxford University, UK. 28 September – 2 October 2026. Plenary.
- 24 **The Power of Positive Samples: Eliminating Negative Event Weights with Optimal Transport.**
2026 Meeting of the APS Division of Particles & Fields, Fermilab, USA. 20–24 July 2026. Parallel.
- 23 **Software and Reconstruction at a Muon Collider.**
Artificial Intelligence for Muon Colliders Mini-Workshop (AI4MuC). Virtual. 29–30 July 2026. Plenary.
- 22 **Extractions of the strong coupling from ATLAS and CMS Run 2 data.**
15th Annual Workshop on QCD at the LHC (QCD@LHC 2025), Stony Brook University, USA. 8–12 September 2025. Plenary, on behalf of the ATLAS and CMS Collaborations.
- 21 **Working Group 1 Summary: Minimum Bias, Underlying Event & Monte Carlo Generators.**
14th International Workshop on Multi-Parton Interactions at the LHC (MPI@LHC 2023), University of Manchester, England. 20–24 November 2023. Plenary.
- 20 **Studies of hadronisation and the Underlying Event / Multi-Parton Interactions with ATLAS Run 2 Data.**
14th MPI@LHC 2023, University of Manchester, England. 20–24 November 2023. Plenary, on behalf of the ATLAS Collaboration.
- 19 **Giving events a new shape: measurements of multijet event isotropy at ATLAS using optimal transport.**
ML4Jets 2023, DESY, Hamburg, Germany. 6–10 November 2023. Plenary, on behalf of the ATLAS Collaboration.
- 18 **Testing the Strong Force with Photons and Jets.**
Standard Model at the LHC (SM@LHC 2023), Fermilab, USA. 10–14 July 2023. Plenary, on behalf of the ATLAS and CMS Collaborations.
- 17 **Breaking q/g degeneracies when extracting the strong coupling from jet substructure.**
First Lund Jet Plane Institute, CERN Theory Department. 3–7 July 2023. Plenary.
- 16 **Going off topics to demix quarks and gluons when extracting α_S .**
14th International Workshop on Boosted Object Phenomenology (BOOST 2022), Universität Hamburg, Germany. 15–19 August 2022. Plenary.
- 15 **Overview (Experimental).**
14th BOOST 2022, Universität Hamburg, Germany. 15–19 August 2022. Plenary.
- 14 **Jet Reconstruction in ATLAS.**
Semi-Visible Jets Workshop 2022, ETH H nggerberg, Z rich, Switzerland. 5–7 July 2022. Plenary, on behalf of the ATLAS Collaboration.
- 13 **Jet and photon physics in ATLAS and CMS.**
56th Rencontres de Moriond: QCD and High-Energy Interactions, La Thuile, Italy. 19–26 March 2022. Plenary, on behalf of the ATLAS and CMS Collaborations.
- 12 **Recent results with radiation-tolerant TowerJazz 180 nm MALTA Sensors.**
16th Vienna Conference on Instrumentation (VCI2022). Online. 21–25 February 2022. Plenary.

11 Jet substructure and event shapes with ATLAS.

8th Conference on Large Hadron Collider Physics (LHCP 2020). Online. 25–30 May 2020. Parallel, on behalf of the ATLAS Collaboration.

10 Precision jet substructure measurements with ATLAS Run 2 data.

APS Virtual Meeting. 18–21 April 2020. Parallel, on behalf of the ATLAS Collaboration.

9 Standard Model Highlights & Prospects.

2019 Brookhaven Forum: Particle Physics & Cosmology in the 2020's, Brookhaven National Laboratory, USA. 25–27 September 2019. Plenary, on behalf of the ATLAS and CMS Collaborations.

8 Novel Probes of QCD: Jet Substructure Measurements at the LHC.

2019 Meeting of the APS Division of Particles & Fields, Boston, USA. 29 July – 2 August 2019. Parallel, on behalf of the ATLAS, CMS, ALICE and LHCb Collaborations.

7 Hadronic final state reconstruction in ATLAS SUSY searches.

11th BOOST 2019, Cambridge, Massachusetts, USA. 21–27 July 2019. Plenary, on behalf of the ATLAS Collaboration.

6 Inclusive searches for squarks and gluinos with the ATLAS detector.

26th International Workshop on Deep-Inelastic Scattering (DIS 2018), Kobe, Japan. 16–20 April 2018. Parallel, on behalf of the ATLAS Collaboration.

5 Tagging boosted top quarks and Higgs bosons in ATLAS.

7th BOOST 2015, Chicago, Illinois, USA. 10–14 August 2015. Plenary, on behalf of the ATLAS Collaboration.

4 Direct stop production in boosted hadronic final states.

50th Winter Nuclear and Particle Physics Conference, Banff, AB, Canada. February 16, 2013.

3 Top-antitop cross section measurement with the ATLAS detector at the LHC.

Atlantic Universities Physics and Astronomy Conference (AUPAC), St. Francis-Xavier University, NS, Canada. February 4–6, 2011.

2 Top-antitop cross section measurement with the ATLAS detector at the LHC.

52nd Canadian Undergraduate Physics Conference (CUPC), Dalhousie University, NS, Canada. October 13–16, 2010.

1 Simulation and interpretation of HA-ADF images in scanning transmission electron microscopy.

Atlantic Universities Physics and Astronomy Conference (AUPAC), Acadia University, NS, Canada. February 5–7, 2010.

Poster presentations

4 Comparative performance of ATLAS boosted W taggers using different AI/ML algorithms.

15th International Workshop on Boosted Object Phenomenology (BOOST 2023), Lawrence Berkeley National Laboratory, USA. 31 July – 4 August 2023. Poster, on behalf of the ATLAS Collaboration.

3 Measurements and Applications of Jet Substructure with the ATLAS Detector.

2019 Meeting of the APS Division of Particles & Fields, Boston, USA. 29 July – 2 August 2019. Poster, on behalf of the ATLAS Collaboration.

- 2 **Impact of Alternative Inputs and Grooming Methods on Large-R Jet Reconstruction in ATLAS.**
133rd LHCC Meeting Open Session, CERN, Switzerland. 26 February – 2 March 2018. Poster, on behalf of the ATLAS Collaboration.
- 1 **Jet reclustering and close-by effects in ATLAS Run 2.**
8th BOOST 2017, Buffalo, New York, USA. 16–21 July 2017. Poster, on behalf of the ATLAS Collaboration.

Invited seminars and colloquia

- 8 **Jet Propulsion: Advancing the performance and understanding of hadronic objects for Run 3.**
University of Manchester, Bohr high-energy physics seminar. November 17, 2023.
- 7 **Jet Propulsion: Advancing the performance and understanding of hadronic objects for Run 3.**
University of Warwick, high-energy physics seminar. November 16, 2023.
- 6 **Jet Propulsion: Advancing the performance and understanding of hadronic objects for Run 3.**
Cambridge University, high-energy physics seminar. November 14, 2023.
- 5 **Perspectives on hadronic final states, from up close & far away.**
Università di Genova, seminar on phenomenology of particle physics. May 24, 2023.
- 4 **Advances in Jet Physics: Insights into Hadronic Final States & the Strong Force.**
Brookhaven National Laboratory, invited seminar. March 27, 2023.
- 3 **Advances in Jet Physics: Insights into Hadronic Final States & the Strong Force.**
Southern Methodist University, invited seminar. March 23, 2023.
- 2 **MAPS to Discoveries.**
Argonne National Laboratory (online), invited seminar. October 21, 2021.
- 1 **Inside and Out: Precision Jet Physics in ATLAS Run 2.**
Georg-August-Universität Göttingen, summer seminar series. July 5, 2019.

SUPERVISION AND MENTORING

Postdoctoral Research Associates

- 1 **Dr. Lauren Hay**, PhD from SUNY Buffalo 2025 (Supervisor: Prof. Salvatore Rappoccio).
 - Studies of negative weight mitigation in collider physics simulations and of the effect of lossy compression on collider physics datasets.
 - Precision QCD cross-section measurements with CMS Data.
 - CMS Experiment Particle Flow Validation Contact, 2022–Present.
 - ★ *US CMS Computing R&D Initiative Awardee, 2026–2027.*

Doctoral students

- 3 **Yuanchen Zhou**, anticipated PhD: 2029.
 - Studying the performance of AI-based jet calibrations for the CMS Experiment, particularly in the context of potential bias due to the use of flavor disaggregated data in training.
 - CMS Data Quality Remote Shifter (Jets & Missing Energy), 2025.

2 **Camille Mauceri**, anticipated Ph.D. 2028.

- Contributing to studies of negative weight mitigation in collider physics simulations and to improvements for charged particle track reconstruction in dense environments for the CMS Experiment.
- CMS Data Quality Remote Shifter (Jets & Missing Energy), 2025.

1 **Rishabh Jain**, anticipated Ph.D. 2027.

- Contributing to studies of negative weight mitigation in collider physics simulations and to in situ charged-hadron calibrations for the CMS Experiment.
- CMS Data Quality Remote Shifter (Jets & Missing Energy), 2025.

Master's students

5 **Shiyu Peng**, anticipated Sc.M. 2027.

- *Thesis*: A fast generative AI model for simulating beam-induced background at a Muon Collider (working title).

4 **Grant Whitman**, Sc.M. 2026.

- *Thesis*: Massive $1 \rightarrow 3$ Splitting Functions Without Kinematical Limits.
- *Afterward*: PhD Student with Simone Marzani, Università di Genova, Italy.

3 **Haochen Wang**, Sc.M. 2026.

- *Thesis*: A study of Higgs couplings at a future circular electron-positron collider in the Julia programming language.

2 **Shutong Dong**, Sc.M. 2025.

- *Thesis*: Studies of the effects of lossy compression on hadronic jet reconstruction and classification.
- *Afterward*: Project Manager, GE Healthcare, Yizhuang, China.

1 **Yuanchen Zhou**, Sc.M. 2025.

- *Thesis*: Applications of knowledge distillation in jet tagging at the LHC.
- *Afterward*: PhD Student, Brown University.

Undergraduate students

12 **Christine Chang**, anticipated graduation 2029 (Physics).

- UTRA, Fall 2026: *Studying the performance of jet algorithms at a future Muon Collider*.

11 **Hanting Li**, anticipated graduation 2028 (Applied Mathematics).

- Undergraduate Teaching and Research Award (UTRA), Summer 2026: *Developing an Open Source Julia-Based Optimal Transport Library for Particle Physics*.

10 **Henry Greenhut**, anticipated graduation 2028 (Physics & Computer Science).

- UTRA, Summer 2026: *Understanding the Statistical Properties of Beam-Induced Background Overlays at a future Muon Collider*.

9 **Cameron Peckham**, anticipated graduation 2027 (Physics).

- UTRA, Spring & Summer 2026: *Studies of Event Shape Observables at a Future Muon Collider*.

8 **Nico DiLullo**, anticipated graduation 2027 (Physics & Computer Science). Undergraduate Researcher, 2025–present. Supervisor.

- Fall 2025 – Present: *Optimizing LHC Data Storage via Floating-Point Quantization*.

- 7 **Regan Doherty**, anticipated graduation 2027 (Physics & German Studies). Undergraduate Researcher, 2025–present. Co-supervisor.
 - Fall 2025 – Present: *Hadronic object performance at a future Muon Collider*.
 - Summer 2025: *Studies of negative weight density in simulated collider events with deep learning*.
- 6 **Zhixing (Grace) Wang**, anticipated graduation 2028 (Mathematics).
 - UTRA, Fall 2025: *Improving searches for dark matter at the LHC with Optimal Transport*.
- 5 **Ethan Lynn**, anticipated graduation 2027 (Physics).
 - UTRA, Summer 2025: *Implementation of the Valencia jet clustering algorithm in JetReconstruction.jl*.
- 4 **Kirill Vesialou**, anticipated graduation 2028 (Physics).
 - UTRA, Summer 2025: *Implementation of ghost-based active area calculations in JetReconstruction.jl*.
- 3 **Ema Dimitrova**, anticipated graduation 2027 (Computer Engineering).
 - UTRA, Spring 2025: *Implementation of pile-up mitigation algorithms in JetReconstruction.jl*.
- 2 **Austine Zhang**, anticipated graduation 2026 (Applied Mathematics & Music).
 - UTRA, Fall 2024: *Visualizing jet algorithms at the Large Hadron Collider*.
- 1 **Samuel Ferraro**, Sc.B. 2025 (Physics — Mathematical, Magna cum laude, honours). Undergraduate Researcher, 2024–25. Co-supervisor.
 - *Thesis*: Investigations into Beam-Induced Background and Mitigation Strategies at a future Muon Collider.
 - ★ *Mildred Widgoff Prize for Excellence in Thesis Preparation, Brown University Department of Physics*.
 - ★ *“Most Enthusiastic Presenter” Poster Prize at the Inaugural US Muon Collider Meeting (7–9 August 2024, Fermi National Accelerator Laboratory)*.
 - IRIS-HEP Fellow, Summer 2024 (Supervisor: Dr. Simone Pagan-Griso, Lawrence Berkeley National Laboratory).
 - *Afterward*: PhD Student, Harvard University, Massachusetts, USA.

■ Presentations of supervised work

- 23 **Lauren Hay**, *Quantifying Lossy Jet Compression using Optimal Transport*.
Poster, 2026 Meeting of the APS Division of Particles & Fields, Fermilab, USA. 20–24 July 2026.
- 22 **Lauren Hay**, *Cell Reweighting Algorithms for Pathological Weight Mitigation in LHC Simulations using Optimal Transport*.
Plenary talk, New Perspectives 2026, Fermilab, USA. 16–17 July 2026.
★ *Best talk in the Computing & AI track*.
- 21 **Regan Doherty**, *Calibrating Electromagnetic and Hadronic Calorimeter Signals in the MAIA Detector Concept*.
Poster, 2026 IMCC and MuCol Annual Meeting, CERN. 22–25 June 2026.
- 20 **Rishabh Jain**, *A Phase-Space Inclusive Figure of Merit based in Optimal Transport for Validating Monte Carlo Reweightings*.
Parallel talk, 28th CHEP 2026, Chulalongkorn University, Bangkok, Thailand. 25–29 May 2026.
- 19 **Lauren Hay**, *Cell Reweighting Algorithms for Pathological Weight Mitigation in LHC Simulations using Optimal Transport*.
Parallel talk, 28th CHEP 2026, Chulalongkorn University, Bangkok, Thailand. 25–29 May 2026.

- 18 **Grant Whitman**, *Massive $1 \rightarrow 3$ Splitting Functions Beyond Kinematical Limits*.
Parallel talk, 2026 Phenomenology Symposium (PHENO), University of Pittsburgh, USA. 11–13 May 2026.
- 17 **Camille Mauceri**, *The Power of Positive Samples: Eliminating Negative Weights with Optimal Transport*.
Lightning Round Talk, 2025 US LHC Users’ Association Annual Meeting, University of Washington, Seattle, USA. 16–19 December 2025.
- 16 **Yuanchen Zhou**, *The Pareto frontier of resilient jet tagging*.
Poster, NeurIPS 2025: Machine Learning & the Physical Sciences Workshop, San Diego, USA. 2–7 December 2025.
- 15 **Haochen Wang**, *High-Energy Physics Workflows in Native Julia*.
APS New England Section, Brown University, USA. 7–8 November 2025.
- 14 **Sam Ferraro**, *Suppressing backgrounds at a future Muon Collider with the SoftKiller algorithm*.
APS New England Section, Brown University, USA. 7–8 November 2025.
- 13 **Grant Whitman**, *Computing Massive $1 \rightarrow 3$ Splitting Kernels for Future Parton Shower Models*.
APS New England Section, Brown University, USA. 7–8 November 2025.
- 12 **Yuanchen Zhou**, *The Pareto Frontier of Resilient Jet Tagging*.
APS New England Section, Brown University, USA. 7–8 November 2025.
- 11 **Rishabh Jain**, *Learning the Space of Collider Events*.
APS New England Section, Brown University, USA. 7–8 November 2025.
- 10 **Camille Mauceri**, *Cell Reweighting Algorithms for Pathological Weight Mitigation in LHC Simulations using Optimal Transport*.
APS New England Section, Brown University, USA. 7–8 November 2025.
- 9 **Rishabh Jain**, *Cell Reweighting Algorithms for Pathological Weight Mitigation Using Optimal Transport*.
2025 IAIFI Summer Workshop, Harvard University, USA. 11–15 August 2025.
- 8 **Rishabh Jain**, *Cell Reweighting Algorithms for Pathological Weight Mitigation Using Optimal Transport*.
Poster, BOOST 2025, Brown University, USA. 28 July – 1 August 2025.
- 7 **Sam Ferraro**, *Applying SoftKiller at the Muon Collider*.
Poster, BOOST 2025, Brown University, USA. 28 July – 1 August 2025.
- 6 **Grant Whitman**, *Computing Massive $1 \rightarrow 3$ Splitting Kernels for Future Parton Shower Models*.
Poster, BOOST 2025, Brown University, USA. 28 July – 1 August 2025.
- 5 **Ema Dimitrova**, *Julia-based study of SoftKiller performance in high-pileup conditions*.
Poster, BOOST 2025, Brown University, USA. 28 July – 1 August 2025.
- 4 **Grant Whitman**, *Computing Massive $1 \rightarrow 3$ Splitting Kernels for Future Parton Shower Models*.
Poster, 18th MCnet Summer School, Stirling, Scotland, UK. 8–13 June 2025.
- 3 **Sam Ferraro**, *ACTS tracking in Key4hep*.
FCC-ee Workshop: Tracking Detectors and Software, Brookhaven National Laboratory, USA. 7–9 May 2025.

- 2 **Sam Ferraro**, *Advancements in ACTS: Speed and Adaptability for the Muon Collider*.

Poster, Inaugural US Muon Collider Meeting, Fermilab, USA. 7–9 August 2024.

- 1 **Yuanchen Zhou**, *Going beyond the jet tagging frontier using knowledge distillation*.

Contributed parallel talk, 2024 IAIFI Workshop, Massachusetts Institute of Technology, USA. 12–16 August 2024.

TEACHING

| Brown University

2024 – Pres. **Physics 0040 — Basic Physics B.** Instructor / lab manager / course manager.

- Fall 2026, expected enrollment: 42 students.*
- Fall 2025, enrollment: 48 students.*
- Fall 2024, enrollment: 39 students.

2025 – Pres. **Physics 0560 — Experiments in Modern Physics.** Instructor.

- Spring 2027, expected enrollment: 40 students.*
- Spring 2026, enrollment: 40 students.*
- Spring 2025, enrollment: 44 students.*

* the class was at the enrollment cap, which can vary year-to-year.

| Summer/winter schools, pedagogical lectures

Jan 2026 Brown University Physics AI Winter Workshop — *Applications of Optimal Transport in High-Energy Physics*, instructor.

- Over 470 registered participants · indico.physics.brown.edu/event/192

Jul 2024 BOOST 2024 “BOOST Camp”, experimental instructor — pedagogical module for the 16th International Workshop on Boosted Object Phenomenology (BOOST 2024), Genova, Italy.

Jan 2024 Brown University Physics AI Winter Workshop — *The evolution of boosted top tagging at the LHC*, co-instructor.

- Over 470 registered participants · indico.physics.brown.edu/event/2

| University of Victoria

Spring 2012 Physics 112, Introductory Physics II — Lab Instructor.

Fall 2011 Physics 112, Introductory Physics I — Lab Instructor.

| Acadia University

Spring 2010 Math 2723, Intro. Differential Equations — Teaching Assistant.

Spring 2010 Physics 1063, Gen. Physics II — Lab Assistant.

Fall 2010 Math 1023, Intro. Calculus II — Studio Assistant.

Fall 2009 Physics 1053, Gen. Physics I — Lab Assistant.

Spring 2009 Physics 1023, Intro. Physics II — Lab Assistant.

Fall 2008 Physics Department Drop-In Help Centre — Tutor.

INTERNAL SERVICE (BROWN)

2024 – Pres. Physics Department Outreach & Publications Committee.

2024 Summer/Semester Projects for Research, Internship, Teaching (SPRINT) LINK Awards Reviewer.

Comprehensive exam committees

2026 Yuanchen Zhou, Experimental High-Energy Physics — *chair*.

2026 Lazar Novakovic, Experimental High-Energy Physics.

2025 Camille Mauceri, Experimental High-Energy Physics — *chair*.

2025 Jessica Tang, Experimental High-Energy Physics.

2024 Morgan Lee, Experimental Astrophysics and Cosmology.

2024 Oliver Carey, Experimental Astrophysics and Cosmology.

EXTERNAL SERVICE

Committees, commitments & memberships

2024 – 2026 US LHC Users' Association Executive Committee (USLUEC).

- Outreach/Communications Committee, 2024–2026; Government Relations Committee, 2025–2026.
- Representative of the US high-energy physics community in the annual advocacy trip to the US Capitol, Washington, DC. 21–24 April 2025.

2024 – Pres. NSF AI Institute for Artificial Intelligence and Fundamental Interactions (IAIFI) — Industry Partnership Committee.

2023 – Pres. Electron-Ion Collider (EIC) User Group — Institutional Board Representative, Brown University.

2020 – 2021 Snowmass 2021 US HEP Community Planning Exercise.

- Liaison, Snowmass Early-Career and Energy Frontier, 2020–2021.
- Contact, Snowmass Early-Career Inreach Group, Fall/Winter 2020.

2019 – Pres. American Physical Society, member.

Presentations about outreach, advocacy and policy

4 Global Science: Discoveries and Outlook of the US High Energy Physics Community.

Moderator — panel with H. Newman, K. Kennedy and S. Bhattacharya. 2026 AAAS Annual Meeting, Phoenix, Arizona, USA. 12–14 February 2026.

3 Patterns, Probabilities & Particles: Studying the Quantum World.

International Year of Quantum Science and Technology. NSERC CISE Atlantic & IQCCan High School Talk. 18 November 2025.

2 Global Science: Advocacy & Outreach for the US High Energy Physics Community.

APS New England Section 2025, Brown University, Providence, RI. 7 November 2025.

1 US LHC Users' Association Overview.

I.ANN QCD Summit 2024: Empowering New Talents and Building Global Networks.

Workshop & conference organization

- 2026 Convener, “Reconstruction and Software” Session — International Muon Collider Collaboration Meeting (IMCC 2026), CERN.
- 2025 Experimental Convener, “Soft and Non-Perturbative QCD” Session — QCD@LHC 2025, Stony Brook University, USA.
- 2025 Local Organizing Committee — BOOST 2025, Providence, RI, USA.
- 2025 International Advisory Committee — BOOST 2025, Providence, RI, USA.
- 2024 International Advisory Committee — BOOST 2024, Genoa, Italy.
- 2023 Experimental Convener, “Minimum Bias, Underlying Event & Monte Carlo Generators” Session — MPI@LHC 2023, Manchester, UK.
- 2023 Organising Committee — ATLAS Hadronic Calibration Workshop 2023, IFIC, Valencia, Spain.
- 2023 International Advisory Committee — BOOST 2023, Lawrence Berkeley National Laboratory, USA.
- 2023 Organizing Committee — First Lund Jet Plane Institute, CERN Theory Department.
- 2022 International Advisory Committee — BOOST 2022, Universität Hamburg, Germany.
- 2021 Local Organizing Committee — BOOST 2021, CERN (online).
- 2019 Local Organizing Committee — ATLAS Hadronic Calibration Workshop 2019, University of Arizona, USA.
- 2018 Organizing Committee — ATLAS Hadronic Calibration Workshop 2018, Kirchhoff-Institut für Physik, Heidelberg, Germany.

External mentoring & supervision — doctoral students

- 2024 **Jingjing Pan**, Yale University, USA — thesis analysis mentor. Primary supervisor: Keith Hamilton. PhD defended 7 August 2024.
 - *Thesis*: Exploring the Standard Model and Beyond Through the Lens of Jet Substructure and Deep Learning with the ATLAS Experiment.
 - *Afterward*: Postdoctoral Associate, Karlsruher Institut für Technologie, Germany.
- 2023 **Emily Smith**, University of Chicago, USA — thesis analysis mentor. Primary supervisor: David Miller. PhD defended 30 October 2023.
 - *Thesis*: A Global View of Jets With the ATLAS Detector: From Hardware Triggers to Precision Measurements and Beyond.
 - ★ *ATLAS Thesis Award Recipient*.
 - *Afterward*: Lederman Fellow, Fermi National Accelerator Laboratory (Fermilab).

- 2023 **Christof Sauer**, Kirchhoff-Institut für Physik, Heidelberg, Germany — thesis analysis mentor. Primary supervisor: Andre Schöning. PhD defended 24 October 2023.
- *Thesis*: Measurement of the Triple-Differential Cross-Section for the Production of Multijet Events using 139 fb^{-1} of Proton-Proton Collision Data at $\sqrt{s} = 13 \text{ TeV}$ with the ATLAS Detector to Disentangle Quarks and Gluons at the Large Hadron Collider.
 - *Afterward*: Postdoctoral Associate, Kirchhoff-Institut für Physik, Heidelberg, Germany.

External mentoring & supervision — undergraduate students

- 2026 **Moisés Poó García**, University of Cantabria, Spain — summer exchange student; mentor. *Contrastive Learning Applications for Calorimeter Cell Clustering at a future Muon Collider*.
- 2022 **Jonathan Barrett**, Memorial University of Newfoundland, Canada — Institute of Particle Physics CERN Summer Student. Co-supervisor.
- *Afterward*: MSc Student, Memorial University of Newfoundland.
- 2019 **Alejandro Reyes**, Cal State University, Fresno, USA — Cal State CERN Summer Student. Co-supervisor.
- 2019 **Hector Delgado**, Cal State University, Los Angeles, USA — Cal State CERN Summer Student. Co-supervisor.
- *Afterward*: PhD Candidate (Astrobiology), University of Washington.

External Ph.D. examiner

- 2026 **Camila Pazos**, *Measurement of the $W + \text{jets}$ production at $\sqrt{s} = 13 \text{ TeV}$ at the ATLAS Detector*. Supervisor: Pierre-Hughes Beauchemin. Tufts University, USA. Defended 11 August 2026.
- 2026 **Alberto Rescia**, *An exploration of heavy flavor jets: from phenomenology to precision measurements at the ATLAS Experiment*. Supervisor: Federico Sforza. Università di Genova, Italy. 16 April 2026.
- 2023 **Louis Ginabat**, *Étalonnage des jets et mesures précises de sections efficaces de production de jets avec les données de l'expérience ATLAS*. Directrice de thèse: Mélissa Ridet; co-encadrant: Bogdan Malescu. LPNHE, Paris, France. 25 September 2023.

Funding agency review

- 2025 NSF Graduate Research Fellowships Program (GRFP).
- 2024 European Research Council (ERC).

PEER REVIEW & EDITORIAL DUTIES

- 2024 – Pres. Peer Referee, Physical Review D (PRD).
- 2023 – Pres. Peer Referee, Nuclear Science and Techniques (NST).
- 2023 – Pres. Associate Editor, Frontiers in Big Data and AI in High Energy Physics.
- 2023 – Pres. Review Editor, Frontiers in Physics: Radiation Detectors and Imaging.
- 2022 – Pres. Peer Referee, European Physical Journal C (EPJC).
- 2022 – Pres. Peer Referee, Physical Review Letters (PRL).

2021 – Pres. Peer Referee, Journal of High-Energy Physics (JHEP).

Collaboration-internal review

- 2026 Analysis Review Committee — *Top pair production cross-section measurement in Pb+Pb collisions at 5.02 TeV*. [arXiv:2604.27091](#) · [CMS-HIN-24-021](#) · [InspireHEP](#).
- 2025 Analysis Review Committee — *Jet fragmentation function and groomed substructure of bottom quark jets in proton-proton collisions at 5.02 TeV with the CMS Detector*. [arXiv:2511.10666](#) · [CMS-HIN-24-005](#) · [InspireHEP](#).
- 2022 Second reader — *R=0.4 jets input comparison and Monte Carlo calibration with the ATLAS Detector*. [ATL-PHYS-PUB-2022-038](#), public note (preliminary result).
- 2019 Second reader — *Transverse momentum response and reconstruction efficiency for jets from displaced decays in the ATLAS detector*. [ATL-PHYS-PUB-2019-025](#), public note (preliminary result).
- 2018 Editorial board chair — *Measurement of the R=0.4 jet mass in Pb+Pb and pp collisions at $\sqrt{s_{NN}} = 5.02$ TeV with the ATLAS detector*. [ATLAS-CONF-2018-014](#), preliminary result for Quark Matter 2018, Venice, Italy.

OUTREACH

Public events and interactions

- 2020 – Pres. Videoconference Moderator, IPPOG / QuarkNet Physics Masterclasses.
- 2024 US LHC Users' Association Booth — American Association of Physics Teachers Summer Meeting, Boston, USA.
- 2019 ATLAS Science Cafe & Walking Tour Guide — CERN Open Days.
- 2014 – 2015 Guide — TRIUMF + Emily Carr School of Art & Design Artists-In-Residence visits.
- 2013 – 2015 Volunteer Public Tour Guide — TRIUMF.
- 2014 Local Instructor — TRIUMF IPPOG / QuarkNet Physics Masterclasses.
- 2013 Photographer — TRIUMF Open House.
- 2012 Local Instructor — University of Victoria IPPOG / QuarkNet Physics Masterclasses.

Magazine and online articles

- 2023 ATLAS Collaboration, *Machine learning is revolutionising our understanding of particle “jets”*. Online, 3 August 2023.
- 2023 ATLAS Collaboration, *Signal and noise: how timing measurements and AI are improving ATLAS event reconstruction*. Online, 1 August 2023.
- 2023 ATLAS Collaboration, *Giving collisions a new shape: New ATLAS result measures isotropy of LHC events*. Online, 14 July 2023.
- 2020 ATLAS Collaboration, *Novel probes of the strong force: precision jet substructure and the Lund jet plane*. ATLAS Physics Briefing, online, 19 April 2020.
- 2018 ATLAS Collaboration, *A decade of advances in jet substructure*. CERN Courier, Vol. 58, No. 8, October 2018.