Matt LeBlanc, Ph.D.

CURRICULUM VITÆ

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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

2025 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

30 **Fast BIB simulation at a future Muon Collider with generative machine learning.**
R. Mastandrea, S. Peng, B. Rosser & M. LeBlanc · Preprint
arXiv:2609.12054 · InspireHEP

29 **Learning the Geometry of Collider Events with Metric-Aware Deep Sets.**
L. Hay, R. Jain, M. LeBlanc & J. Roloff · NeurIPS 2026 Geometric Distributional Deep Learning (GDDL) Workshop
arXiv:2609.12024 · InspireHEP

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-STDM-2022-05 · InspireHEP

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

22 **A Field Guide to Event-Shape Observables Using Optimal Transport.**

C. Cesarotti & M. LeBlanc · JHEP 12 (2025) 014, 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 · EPJC 85 (2025) 927, 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 μW radiation-hard front-end in a 0.18 μm 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 Hönggerberg, Zürich, 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 $1 \to 3$ 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**, Sc.B. 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* $1 \to 3$ *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* $1 \to 3$ *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* $1 \to 3$ *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* $1 \to 3$ *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 & IYQCan 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 $\sqrt{s} = 13$ 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 + jets production at $\sqrt{s} = 13$ 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 Ridel; 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.