

Matt LeBlanc, Ph.D.

Curriculum vitae

Updated: 20 November 2023



Contact Information

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Research in High-Energy Physics

Member of the **ATLAS Collaboration** from 2010-2023 (signing author, 2015-Present).

- Differential jet and jet substructure measurements.
- Hadronic object reconstruction & calibration; boosted object tagging.
- Searches for new particles in hadronic final states.
- (*prev.*) Characterisation of prototype, radiation-hard CMOS pixel sensors.

Positions

Brown University

Starting January 2024

Providence, Rhode Island, USA

Assistant Professor of Physics (Research)

- **Affiliation:** Brown Centre for Fundamental Physics of the Universe (CFPU)

University of Manchester

April 2023 — Present

Manchester, Greater Manchester, England, UK

Postdoctoral Research Associate

CERN

January 2021 — March 2023

Meyrin, Geneva, Switzerland

Senior Research Fellow

University of Arizona

July 2017 — December 2020

Tucson, Arizona, USA

Postdoctoral Research Associate

Education

University of Victoria

Fall 2011 — Spring 2017

Victoria, BC, Canada

Ph.D., Experimental Particle Physics

Advisor: Rob McPherson (Victoria / IPP)

Acadia University

Fall 2007 — Spring 2011

Wolfville, NS, Canada

B.Sc.(H.), Physics & Mathematics

J. L. Ilsley High School

Fall 2004 — Spring 2007

Halifax, NS, Canada

French Immersion

Leadership

ATLAS Collaboration

- **Physics Coordination**, *ex officio* member (Jet/EtMiss Convenership), 2022-2023.
- **Jet/EtMiss Combined Performance Group Convener**, 2022-2023.
 - **Coordination of work from ~200 contributing physicists**, across five subgroups on topics related to jet and missing transverse momentum reconstruction, calibration, software and R&D for new approaches.
 - **Oversight of ~30 'Authorship Qualification Projects'** (work typically performed by new graduate students, postdocs and faculty when joining the collaboration).
 - **Led the collaboration-internal review of public results**, including 6 peer-reviewed publications, 12 other preliminary results and >20 presentations at international conferences that were prepared by members of the group.
- **Subgroup Convener**, Standard Model Jet & Photon Physics, 2020-2022.
 - *Management and review of ~15 ongoing physics measurements and associated publications.*
- **Subgroup Convener**, Jet/EtMiss Definitions & MC Calibrations, 2019-2020.
 - *Coordination of research activities for ~30 researchers working in the area of hadronic object reconstruction and calibration using simulation-based techniques.*
- **Subgroup Convener**, Jet/EtMiss Jet Energy Scale & Resolution, 2018-2019.
 - *Coordination of research activities for ~80 scientists working in this the area of jet reconstruction and calibration using both in situ and simulation-based techniques.*
- Other roles
 - **Shift Leader**, ATLAS Control Room. *Run 2, 3 pp and Pb+Pb data-taking & pilot-beam operations between 2018-2022.*
 - **Coordinator**, core software ('Athena') code review shifts. 2017-2021.
 - **Liaison**, between Jet/EtMiss and Supersymmetry Groups. 2017-2020.
 - **Calo/Forward Detector Shifter**, ATLAS Control Room. *Run 2 pp data-taking in 2015.*

Awards

CTEQ Collaboration **Wu Ki Tung Award for Early-Career Research in QCD**, 2022.

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."

NSERC	Postgraduate Scholarship - Doctoral , 2014-2017.
University of Victoria	President's Research Scholarship , 2012-2013, 2014-2017.
NSERC	Alexander Graham Bell Canada Graduate Scholarship , 2012-2013.
University of Victoria	Fellowship , 2011-2012.
Acadia University	'University Scholar' Designation , 2011.
AUPAC 2011	NSERC Representative's Honourable Mention (Presentation Prize).
TRIUMF	Summer Student Award - Atlantic Region , 2010.
NSERC	Undergraduate Summer Research Award , 2010, <i>Declined</i> .

Acadia University	Kenneth A. Killam Award , 2010.
Acadia University	Dr. Lalia B. Chase Scholarship , 2008, 2009, 2010.
Acadia University	Honours Research Summer Award , 2009.
Acadia University	Acadia Physics Departmental Scholarship , 2009.
Acadia University	Edgar Delap Bent Memorial Scholarship in Physics , 2008.
Acadia University	Alfred D. Arthurs Scholarship in Chemistry , 2007.
Acadia University	Acadia Excellence Scholarship , 2007.

Publications and preliminary results

I am an author of over 737 peer-reviewed results since 2015, as a member of the ATLAS Collaboration. Listed below are selected results where I have made a personal contribution.

In experimental high-energy physics, a **Contact Editor** is a leadership role on an analysis team, acting as a point of contact to the larger experimental collaboration. They are responsible for coordinating analysis efforts, preparing the manuscript, and for ensuring that the physics results are produced in a timely and accurate manner.

Precision jet and jet substructure measurements

Papers

- ATLAS Collaboration, *Measurements of multijet event isotropies using optimal transport with ATLAS*. J. High Energ. Phys. 10 (2023) 060. [doi:10.1007/JHEP10\(2023\)060](https://doi.org/10.1007/JHEP10(2023)060). [arXiv:2305.16930](https://arxiv.org/abs/2305.16930) [hep-ex].
 - * Contact editor
 - * Theory associate for analysis (STA): Cari Cesarotti (MIT)
 - * ATLAS physics briefing: *Giving collisions a new shape: New ATLAS result measures isotropy of LHC events*.
- ATLAS Collaboration, *Measurement of the Lund Jet Plane with charged particles in 13 TeV pp collisions with the ATLAS detector*. Phys. Rev. Lett. 124 (2020) 222002. [ATLAS-STD-2018-57](https://arxiv.org/abs/2004.03540), [arXiv:2004.03540](https://arxiv.org/abs/2004.03540) [hep-ex].
 - * Contact editor
 - * ATLAS physics briefing: *Novel probes of the strong force: precision jet substructure and the Lund jet plane*
- ATLAS Collaboration, *A measurement of soft-drop jet observables in pp collisions with the ATLAS detector at $\sqrt{s}=13$ TeV*. Phys. Rev. D 101, 052007 (2020). [ATLAS-STD-2017-33](https://arxiv.org/abs/1912.09837), [arXiv:1912.09837](https://arxiv.org/abs/1912.09837) [hep-ex].
 - * ATLAS physics briefing: *Novel probes of the strong force: precision jet substructure and the Lund jet plane*

Hadronic object reconstruction and calibration

Papers

- ATLAS Collaboration, *New techniques for jet calibration with the ATLAS detector*. Eur. Phys. J. C 83 (2023) 761. [ATLAS-JETM-2022-01](#), [arXiv:2303.17312 \[hep-ex\]](#).
- ATLAS Collaboration, *Optimisation of large-radius jet reconstruction for the ATLAS detector in 13 TeV proton-proton collisions*. Eur. Phys. J. C 81 (2021) 4, 334. [ATLAS-JETM-2018-06](#), [arXiv:2009.04986 \[hep-ex\]](#).
 - * Contact editor
- ATLAS Collaboration, *Jet energy scale and resolution measured in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector*. Eur. Phys. J. C 81 (2021) 8, 689. [ATLAS-JETM-2018-05](#), [arXiv:2007.02645 \[hep-ex\]](#).
- ATLAS Collaboration, *In situ calibration of large-radius jet energy and mass in 13 TeV proton-proton collisions with the ATLAS detector*. Eur. Phys. J. C 79 (2019) 135. [ATLAS-JETM-2018-02](#), [arXiv:1807.09477 \[hep-ex\]](#).
 - * Contact editor
 - * CERN Courier Article. *A decade of advances in jet substructure*. 28 September, 2018.
- ATLAS Collaboration, *Identification of high transverse momentum top quarks in pp collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector*. Journal of High Energy Physics, 06, 093 (2016). [ATLAS-PERF-2015-04](#), [arXiv:1603.03127 \[hep-ex\]](#).
 - * ATLAS Physics Briefing: *ATLAS ready to “boost” Run 2 physics*.

Preliminary results

- ATLAS Collaboration, *Constituent-based W-boson tagging with the ATLAS Detector*. [ATL-PHYS-PUB-2023-020](#), Public note (Preliminary result). July 2023.
 - * ATLAS Physics Briefing: *Machine learning is revolutionising our understanding of particle “jets”*
- ATLAS Collaboration, *Identification of hadronically-decaying top quarks using UFO jets with ATLAS in Run 2*. [ATL-PHYS-PUB-2021-028](#), Public note (Preliminary result). July 2021.
- ATLAS Collaboration, *Impact of Alternative Inputs and Jet Grooming on Large-R Jet Performance*. [ATL-PHYS-PUB-2019-027](#), Public note (Preliminary result). July 2019.
 - * Contact editor
- ATLAS Collaboration, *Impact of Pile-up on Jet Constituent Multiplicity in ATLAS*. [ATL-PHYS-PUB-2018-011](#), Public note (Preliminary result). July 2018.
- ATLAS Collaboration, *Impact of Alternative Inputs and Grooming Methods on Large-R Jet Reconstruction in ATLAS*. [ATL-PHYS-PUB-2017-020](#), Public note (Preliminary result). December 2017.
- ATLAS Collaboration, *Jet reclustering and close-by effects in ATLAS Run 2*. [ATLAS-CONF-2017-062](#), Preliminary conference result for [BOOST 2017](#), Buffalo, New York, USA. 17-21 July, 2017.

* Contact editor

Public plots

- ATLAS Collaboration, *Summary plots: anti-kt $R=0.4$ precision jet energy scale uncertainty (Rel. 21)*. [JETM-2023-005](#), public plots (November 2023).
- ATLAS Collaboration, *LAr Cells in Clusters with Timing*. [LARG-2023-05](#), public plots (July 2023).
- ATLAS Collaboration, *Comparison of W tagging performance with different ML algorithms*. [JETM-2023-003](#), public plots (July 2023).
- ATLAS Collaboration, *E/p measurements and Geant4 physics list comparisons*. [JETM-2020-03](#), public plots (November 2020).
- ATLAS Collaboration, *In situ large- R jet energy scale calibration and uncertainties in 2015-2017 data*, [JETM-2019-05](#), public plots (July 2019).
- ATLAS Collaboration, *Particle flow jet energy scale in 2015-2017 data and simulation*. [JETM-2019-02](#), public plots (February 2019).
- ATLAS Collaboration, *Particle flow jet energy resolution in 2017 data and simulation*. [JETM-2019-01](#), public plots (February 2019).
- ATLAS Collaboration, *Jet energy scale and uncertainties in 2015-2017 data and simulation*. [JETM-2018-006](#), public plots (November 2018).
- ATLAS Collaboration, *Jet energy resolution in 2017 data and simulation*. [JETM-2018-005](#), public plots (September 2018).
- ATLAS Collaboration, *Stability of jet mass for top, W , and light jets as a function of pile-up*. [JETM-2016-014](#), public plots (December 2016).

Searches for new particles

Papers

- ATLAS Collaboration, *Pursuit of paired dijet resonances in the Run 2 dataset with the ATLAS detector*. Accepted by PRD. [ATLAS-EXOT-2022-18](#). [arXiv:2307.14944](#) [hep-ex].

* *Contact editor*

- ATLAS Collaboration, *Constraints on mediator-based dark matter models using $\sqrt{s} = 13$ TeV pp collisions at the LHC with the ATLAS detector*. [ATLAS-EXOT-2017-32](#), JHEP 05 (2019) 142. [arXiv:1903.01400](#) [hep-ex].
- ATLAS Collaboration, *Combination of the searches for pair-produced vector-like partners of the third-generation quarks at $\sqrt{s} = 13$ TeV with the ATLAS detector*. Phys. Rev. Lett. 121 (2018) 211801. [ATLAS-EXOT-2017-17](#), [arXiv:1808.02343](#) [hep-ex].
 - * Physical Review Letters “Editor’s Suggestion”
 - * 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?](#)

- ATLAS Collaboration, *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*. JHEP 12 (2018) 039. [ATLAS-EXOT-2016-16](#), [arXiv:1807.11883 \[hep-ex\]](#).
- ATLAS Collaboration, *Search for Supersymmetry in final states with missing transverse momentum and multiple b-jets in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector*. JHEP 06 (2017) 107. [ATLAS-SUSY-2016-10](#), [arXiv:1711.01901 \[hep-ex\]](#).
- ATLAS Collaboration, *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*. Physical Review D 94, 032003 (2016). [ATLAS-SUSY-2015-10](#), [arXiv:1605.09318 \[hep-ex\]](#).
- ATLAS Collaboration, *Search for direct pair production of the top squark in all-hadronic final states in proton-proton collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector*. Journal of High Energy Physics, 09, 015 (2014). [ATLAS-SUSY-2013-16](#), [arXiv:1406.1122 \[hep-ex\]](#).

High-energy physics phenomenology

Papers

- M. LeBlanc, B. Nachman & C. Sauer, *Going off topics to demix quarks and gluons in extractions of α_s* . JHEP 02 (2023) 150, Feb 15, 2023. [arXiv:2206.10642 \[hep-ph\]](#).
- B. Nachman, S. Rappoccio, N. Tran (editors) *et al. Jets and Jet Substructure at Future Colliders*. [Front. Phys. 10, 22 June 2022](#). [arXiv:2203.07462 \[hep-ph\]](#).

Preliminary results

- ATLAS Collaboration, *Towards a precise interpretation of the top quark mass parameter in ATLAS Monte Carlo samples*. [ATL-PHYS-PUB-2021-034](#), Public Note (Preliminary result). July 2021.
 - * Contact editor
 - * This work was a phenomenological study performed within the ATLAS Collaboration, involving several associated theoretical physicists : Andre Hoang (Vienna), Sonny Mantry (Georgia Tech), Adithya Pathak (Vienna), Iain Stewart (MIT)
- D. De Florian, M. Donegà, M. Dürrssen-Debling, S. Jones, J. Bendavid, A. Huss, J. Huston, S. Kallweit, D. Maître, S. Marzani, B. Nachman, V. Ciulli, S. Prestel, E. Re, *et al. Les Houches 2019: Physics at TeV Colliders: Standard Model Working Group Report*. [arXiv:2003.01700 \[hep-ph\]](#). Proceedings of the 2019 Les Houches Workshop on Physics at TeV Colliders, Les Houches, France.
 - * Contributor to jet substructure studies.

Conference and workshop proceedings

- M. LeBlanc, on behalf of the ATLAS and CMS Collaborations, *Jet and photon physics in ATLAS and CMS*. Proceedings of the [56th Rencontres de Moriond on QCD and High Energy Interactions](#), La Thuile, It, 19 - 26 Mar 2022. [ATL-PHYS-PROC-2022-049](#).

- M. LeBlanc, on behalf of the ATLAS Collaboration. Measurements of event shapes and jet substructure with ATLAS Run 2 data. Proceedings of the Eighth annual conference on Large Hadron Collider Physics (LHCP 2020) — PoS(LHCP2020)144. Online. ATL-PHYS-PROC-2020-047.
- M. LeBlanc, on behalf of the ATLAS Collaboration. *Inclusive searches for squarks and gluinos with the ATLAS detector*. Proceedings of XXVI International Workshop on Deep-Inelastic Scattering and Related Subjects — PoS(DIS2018)078. 16-20 April 2018. Kobe, Hyogo, Japan. ATL-PHYS-PROC-2018-080.
- R. P. Taylor *et al.* *The evolution of cloud computing in ATLAS*. Journal of Physics: Conference Series, Volume 664, Clouds and Virtualization (CHEP 2015, Okinawa, Japan).

Silicon detector research & development

- M. van Rijnbach *et al.* *Performance of the MALTA telescope*. EPJC 83 (2023) 7, 581. 2304.01104 [hep-ex].
- F. Dachs *et al.* *Development of a large-area, light-weight module using the MALTA monolithic pixel detector*. NIM A 1047 (2023) 167809. Proceedings of the 15th Pisa Meeting on Advanced Detectors (PM2021).
- H. Pernegger *et al.* *MALTA-Cz: A radiation hard full-size monolithic CMOS sensor with small electrodes on high-resistivity Czochralski substrate*. JINST 18 (2023) 09, P09018. arXiv:2301.03912 [physics.ins-det].
- G. Gustavino *et al.* *Timing performance of radiation-hard MALTA monolithic pixel sensors*, JINST 18 (2022) 03, C0301. arXiv:14676 [physics.ins-det]. Proceedings of the 23rd international workshop on Radiation Imaging Detectors (IWORID 2022).
- D. Dobrijević *et al.* *MALTA3: Concepts for a new radiation tolerant sensor in the TowerJazz 180 nm technology*. NIM A 1040 (2022) 167226. Proceedings of Vienna Conference on Instrumentation 2022 (VCI2022).
- M. van Rijnbach *et al.*, *Radiation hardness and timing performance in MALTA monolithic pixel sensors in TowerJazz 180 nm*. JINST 17 (2022) 04, C04034. Proceedings of TWEPP21.
- M. LeBlanc *et al.* *Recent results with radiation-tolerant TowerJazz 180 nm MALTA Sensors*. Nucl.Instrum.Meth.A 1041 (2022) 167390. arXiv:2209.04459 [physics.ins-det]. Proceedings of Vienna Conference on Instrumentation 2022 (VCI2022).
- F. Piro *et al.* *A 1 μ W radiation-hard front-end in a 0.18 μ m CMOS process for the MALTA2 monolithic sensor*. IEEE Trans. Nucl. Sci. 69 6 1299-1309, June 2022.

Open-source software

- G. Stark, J. Da, M. Milesi, G. Facini, J. Dandoy, K. Krizka, M. LeBlanc, T. Novak, F. Scutti, B. Tuan, A. Tuna, M. Muskinja, J. Bossio, J. Olsson, T. Lazovich, B. Tong, B. Carlson, C. Doglioni, B. Amadio, R. Zou, M. Frate, P. Bryant, M. Perego, L. Lee, L. McClymont, M. Swiatlowski, C. Nelson, C. Shimmin, A. Cukierman, A. Coccaro. *xAOD AnaHelpers : ATLAS Run II analysis framework for AnalysisTop and AnalysisBase for proton-proton physics*. (2015). url: https://github.com/UCATLAS/xAODAnaHelpers. Zenodo: http://doi.org/10.5281/zenodo.998269.

Presentations

Talks at conferences

- *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, Manchester, England. 20-24 November 2023. Plenary.
- *Studies of hadronisation and the Underlying Event / Multi-Parton Interactions with ATLAS Run 2 Data.* 14th International Workshop on Multi-Parton Interactions at the LHC (MPI@LHC 2023). University of Manchester, Manchester, England. 20-24 November 2023. Plenary, on behalf of the ATLAS Collaboration.
- *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.
- *Testing the Strong Force with Photons and Jets.* Plenary Talk, Standard Model at the LHC (SM@LHC 2023). Fermilab National Laboratory, Batavia, Illinois, USA. 10-14 July 2023. On behalf of the ATLAS and CMS Collaborations. Plenary.
- *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.
- *Overview (Experimental).* 14th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in HEP (BOOST 2022). Universität Hamburg, Hamburg, Germany. 15-19 August, 2022. Plenary.
- *Going off topics to demix quarks and gluons when extracting α_s .* 14th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in HEP (BOOST 2022). Universität Hamburg, Hamburg, Germany. 15-19 August, 2022. Plenary.
- *Jet Reconstruction in ATLAS.* Semi-Visible Jets Workshop 2022, ETH Höggerberg, Zürich, Switzerland. 5-7 July, 2022. Plenary, on behalf of the ATLAS Collaboration.
- *Jet and photon physics in ATLAS and CMS.* 56th Rencontres de Moriond: QCD and High-Energy Interactions Session. La Thuile, Aosta, Italy. 19-26 March, 2022. Plenary, on behalf of the ATLAS and CMS Collaborations.
- *Recent results with radiation-tolerant TowerJazz 180 nm MALTA Sensors.* The 16th Vienna Conference on Instrumentation (VCI2022). Online. 21-25 February, 2022. Plenary.
- *Jet substructure and event shapes with ATLAS.* 8th annual Conference on Large Hadron Collider Physics (LHCP 2020). Online. 25-30 May, 2020. Parallel, on behalf of the ATLAS Collaboration.
- *Precision jet substructure measurements with ATLAS Run 2 data.* APS Virtual Meeting, online, 18-21 April, 2020. Parallel, on behalf of the ATLAS Collaboration.
- *Standard Model Highlights & Prospects.* 2019 Brookhaven Forum: Particle Physics & Cosmology in the 2020's. Brookhaven National Laboratory, Upton, New York, USA. 25-27 September, 2019. Plenary, on behalf of the ATLAS and CMS collaborations.
- *Novel Probes of QCD: Jet Substructure Measurements at the LHC.* 2019 Meeting of the Department of Particles & Fields of the American Physical Society. Boston, Massachusetts, USA. 29 July - 2 August, 2019. Parallel, on behalf of the ATLAS, CMS, ALICE and LHCb collaborations.

- *Hadronic final state reconstruction in ATLAS SUSY searches.* 11th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in HEP (BOOST 2019). Cambridge, Massachusetts, USA. 21-27 July, 2019. Plenary, on behalf of the ATLAS Collaboration.
- *Inclusive searches for squarks and gluinos with the ATLAS detector.* 26th International Workshop on Deep-Inelastic Scattering and Related Topics (DIS 2018). Kobe, Hyogo, Japan. 16-20 April, 2018. Parallel, on behalf to the ATLAS Collaboration.
- *Tagging boosted top quarks and Higgs bosons in ATLAS.* 7th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in HEP (BOOST 2015), Chicago, IL, USA. 10-14 August, 2015. Plenary, on behalf of the ATLAS Collaboration.
- *Direct stop production in boosted hadronic final states.* 50th Winter Nuclear and Particle Physics Conference. Banff, AB, Canada. February 16, 2013.
- *Top-antitop cross section measurement with the ATLAS detector at the LHC.* Atlantic Universities Physics and Astronomy Conference. St. Francis-Xavier University, Antigonish, NS, Canada. February 4-6, 2011.
- *Top-antitop cross section measurement with the ATLAS detector at the LHC.* 52nd Canadian Undergraduate Physics Conference. Dalhousie University, Halifax, NS, Canada. October 13-16, 2010.
- *Simulation and interpretation of HA-ADF images in scanning transmission electron microscopy.* Atlantic Universities Physics and Astronomy Conference. Acadia University, Wolfville, NS, Canada. February 5-7, 2010.

Poster presentations

- *Comparative performance of ATLAS boosted W taggers using different AI/ML algorithms.* 15th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in HEP (BOOST 2023). Lawrence Berkeley National Laboratory, Berkeley, California, USA. 31 July - 4 August, 2023. Poster, on behalf of the ATLAS Collaboration.
- *Measurements and Applications of Jet Substructure with the ATLAS Detector.* 2019 Meeting of the Department of Particles & Fields of the American Physical Society. Boston, Massachusetts, USA. 29 July - 2 August, 2019. Poster, on behalf of the ATLAS Collaboration.
- *Impact of Alternative Inputs and Grooming Methods on Large- R Jet Reconstruction in ATLAS.* 133rd LHCC Meeting Open Session. CERN, Geneva, Switzerland. 26 February - 2 March, 2018. Poster, on behalf of the ATLAS Collaboration.
- *Jet reclustering and close-by effects in ATLAS Run 2.* 8th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in HEP (BOOST 2017). Buffalo, NY, USA. 16-21 July, 2017. Poster, on behalf of the ATLAS Collaboration.

Seminars

- *Jet Propulsion: Advancing the performance and understanding of hadronic objects in ATLAS for Run 3.* Bohr high-energy physics seminar, University of Manchester. Manchester, England, United Kingdom. November 17, 2023.
- *Jet Propulsion: Advancing the performance and understanding of hadronic objects in ATLAS for Run 3.* High-energy physics seminar, University of Warwick. Coventry, England, United Kingdom. November 16, 2023.

- *Jet Propulsion: Advancing the performance and understanding of hadronic objects in ATLAS for Run 3.* Cavendish high-energy physics seminar, Cambridge University. Cambridge, England, United Kingdom. November 14, 2023.
- *Perspectives on hadronic final states, from up close & far away.* Università di Genova: Seminars on phenomenology of particle physics. Genoa, Italy. May 24, 2023.
- *Advances in Jet Physics at the LHC: Insights into Hadronic Final States & the Strong Force with ATLAS Run 2 Data.* Brookhaven National Laboratory. Upton, New York, USA. March 27, 2023.
- *Advances in Jet Physics at the LHC: Insights into Hadronic Final States & the Strong Force with ATLAS Run 2 Data.* Southern Methodist University. Dallas, Texas, USA. March 23, 2023.
- *MAPS to Discoveries.* Argonne National Laboratory. Lemont, Illinois, USA (online). October 21, 2021.
- *Inside and Out: Precision Jet Physics in ATLAS Run 2.* Georg-August-Universität Göttingen Summer Seminar Series. Göttingen, Germany. July 5, 2019.

Other presentations (local / internal)

- *Closing Summary.* ATLAS Hadronic Calibration Workshop 2023. Instituto de Física Corpuscular (IFIC). Valencia, Spain. September 8, 2023.
- *Summary of BOOST 2021.* Snowmass Energy Frontier Workshop — Restart, online, 30 August - 3 September, 2021. Parallel.
- *Highlights of LHCP 2020.* ATLAS Weekly Meeting. CERN (virtual). 9 June, 2020.
- *Jets and missing transverse energy in Run 3.* ATLAS Physics & Performance Week. CERN. January 27-31, 2020.
- *Post-mortem: hadronic object reconstruction in Run 2.* ATLAS Run 2 Physics — Reaching New Heights Workshop. CERN. December 9-13, 2019.
- *ATLAS jet substructure measurements.* ATLAS Standard Model Physics Workshop. University of Belgrade, Belgrade, Serbia. September 17-20, 2019.
- *Status and Challenges of Jet Reconstruction, Substructure and Missing Transverse Energy.* US ATLAS Hadronic Final State Forum XIII. Lawrence Berkeley National Laboratory, Berkeley, California, USA. December 10-14, 2018.
- *Novel Probes of QCD.* ATLAS End-of-Year Jamboree 2018. CERN. December 7, 2018.
- *Jet substructure — beyond tagging.* ATLAS Hadronic Calibration Workshop XIII. Toronto, Canada. 28 August - 1 September, 2017.
- *Tagging boosted objects.* ATLAS Hadronic Calibration Workshop XII. Corfu Summer Institute, Corfu, Greece. September 22, 2016.
- *Searching for stops with boosted tops.* NSERC funding agency review of ATLAS Canada. TRIUMF, Vancouver, BC, Canada. December 11, 2014.
- *Direct stop production in boosted hadronic final states.* ATLAS Canada Workshop. Simon Fraser University, Vancouver, BC, Canada. May 8, 2013.

Mentoring

External mentoring

Ph.D. students

- **Jingjing Pan**, Yale University, New Haven, Connecticut, USA. Supervisor: Keith Hamilton. Anticipated PhD 2024.
 - **Emily Smith**, University of Chicago, Chicago, Illinois, USA. Supervisor: David Miller. PhD defended 30 October 2023.
 - * Afterwards: Lederman Fellow, Fermi National Accelerator Laboratory (Fermilab).
 - **Christof Sauer**, Kirchoff-Institut für Physik, Physikalisches Institute, Heidelberg, Germany. Supervisor: Andre Schöning. Anticipated PhD 2023.
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CERN Summer Students (B.Sc. Students)

- **Jonathan Barrett**, Memorial University of Newfoundland, Corner Brook, Newfoundland, Canada. Institute of Particle Physics CERN Summer Student, 2022. Co-supervised with Max Swiatlowski (TRIUMF).
 - * Afterwards: MSc Student, Memorial University of Newfoundland.
- **Alejandro Reyes**, Cal State University, Fresno, California, USA. Cal State CERN Summer Student, 2019. Co-supervised with Michaela Quietsch-Maitland (Manchester).
- **Hector Delgado**, Cal State University, Los Angeles, California, USA. Cal State CERN Summer Student, 2019. Co-supervised with Michaela Quietsch-Maitland (Manchester).
 - * Afterwards: PhD Candidate (Astrobiology), University of Washington.

Advising

External Ph.D. Examiner

- **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 de thèse: Bogdan Malescu. Laboratoire de Physique Nucléaire et de Hautes Energies (LPNHE), Paris, France. September 2023.

Teaching

University of Victoria

- **Physics 112, Introductory Physics II**. *Lab Instructor, Winter 2012*.
- **Physics 112, Introductory Physics I**. *Lab Instructor, Fall 2011*.

Acadia University

- **Math 2723, Intro. Differential Equations**. *Teaching Assistant, Winter 2010*.

- **Physics 1063, Gen. Physics II.** *Lab Assistant: Winter 2010.*
- **Math 1023, Intro. Calculus II.** *Studio Assistant: Fall 2010.*
- **Physics 1053, Gen. Physics I.** *Lab Assistant: Fall 2009.*
- **Physics 1023, Intro. Physics II.** *Lab Assistant: Winter 2009.*
- **Physics Department Drop-In Help Centre.** *Tutor, Fall 2008.*

Service

External Service

- **Electron-Ion Collider (EIC) User Group**
 - **Institutional Board Representative**, Brown University, *2023-Present.*
- **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*

Workshop/Conference Organisation

- **International Advisory Committee**, BOOST 2024, Genoa, Italy. (July 2024)
- **Experimental Convener**, “Minimum Bias, Underlying Event & Monte Carlo Generators” Session, MPI@LHC 2023. Manchester, United Kingdom (November 2023)
- **Organising Committee**, ATLAS Hadronic Calibration Workshop 2023. Instituto de Física Corpuscular (IFIC). Valencia, Spain (September 2023)
- **International Advisory Committee**, BOOST 2023, East Bay, California, USA (July 2023)
- **Organising Committee**, First Lund Jet Plane Institute. CERN Theory Department (July 2023)
- **International Advisory Committee**, BOOST 2022, Hamburg, Germany (July 2022)
- **Local Organising Committee**, BOOST 2021, CERN (Online, July 2021)
- **Local Organising Committee**, ATLAS Hadronic Calibration Workshop 2019, University of Arizona. Tucson, Arizona, USA (October 2018)
- **Organising Committee**, ATLAS Hadronic Calibration Workshop 2018, Kirchoff-Institut für Physik, Physikalisches Institute. Heidelberg, Germany (September 2018)

Peer Review & Editorial

- Peer Referee, *Nuclear Science and Techniques* (since September 2023)
- Associate Editor, *Frontiers in Big Data and AI in High Energy Physics* (since August 2023)
- Review Editor, *Frontiers in Physics: Radiation Detectors and Imaging* (since August 2023)
- Peer Referee, *European Journal of Physics C* (EPJC, since September 2022)
- Peer Referee, *Physical Review Letters* (PRL, since June 2022)
- Peer Referee, *Journal of High-Energy Physics* (JHEP, since March 2021)

Outreach

Public events and interactions

- **Videoconference Moderator**, IPPOG / QuarkNet Physics Masterclasses, 2020-2022
- **ATLAS Science Cafe & Walking Tour Guide**, CERN Open Days 2019
- **Guide**, TRIUMF + Emily Carr School of Art & Design Artists-In-Residence Visits, 2014, 2015
- **Volunteer Public Tour Guide**, TRIUMF, 2013-2015
- **Local Instructor**, TRIUMF IPPOG / QuarkNet Physics Masterclasses, 2014
- **Photographer**, TRIUMF Open House, 2013
- **Local Instructor**, University of Victoria IPPOG / QuarkNet Physics Masterclasses, 2012

Magazines and online articles

- ATLAS Collaboration, *Machine learning is revolutionising our understanding of particle “jets”*. Online. 3 August 2023.
- ATLAS Collaboration, *Signal and noise: how timing measurements and AI are improving ATLAS event reconstruction*. Online. 1 August 2023.
- ATLAS Collaboration, *Giving collisions a new shape: New ATLAS result measures isotropy of LHC events*. Online. 14 July, 2023.
- ATLAS Collaboration, *A decade of advances in jet substructure*. CERN Courier. Volume 58, Number 8. October, 2018.
- ATLAS Collaboration, *ATLAS Physics Briefing: Novel probes of the strong force: precision jet substructure and the Lund jet plane*. Online. 19 April, 2020.