Muaaz Bhamjee

Associate Professor, Department of Mechanical and Aeronautical Engineering
University of Pretoria

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Language: English Gender: Male Citizenship: South African

ABOUT ME

Prof. Muaaz Bhamjee is currently an Associate Professor in the Department of Mechanical and Aeronautical Engineering at the University of Pretoria. He is the Founder and Principal Investigator of CERG-FLUX Lab - Fluids, Learning, and Uncertainty in compleX systems. He has a background in Mechanical Engineering and Applied Mathematics. He is involved in research and has published in the fields of Computational Fluid Dynamics (CFD), Experimental High Energy Physics (HEP), Heat and Mass Transfer, Experimental Fluid Dynamics, Lattice Boltzmann Modelling, Multiphase Flow, Positron Emission Particle Tracking (PEPT), High Performance Computing (HPC), Solar and Renewable Energy, Solar Air Heating, Atomic Layer Deposition (ALD) Modelling, Fluid-Structure Interaction (FSI), Fluid Dynamics in Biomedical Applications and Engineering Education. The primary focus of his research was in the use of Navier-Stokes and Lattice-Boltzmann based computational fluid dynamics (CFD) approaches in modelling of the multi-scale fluid dynamics, heat and mass transfer processes and AI and data-driven approaches to Climate. Currently he is involved in research related to data driven and machine learning approaches to fluid dynamics, high energy physics, dynamical systems and hybrid quantum computing and machine learning approaches to such.

Prof. Bhamjee's prior experience includes roles as Staff Research Scientist at IBM Research – Africa, Senior Research Associate (Visiting) at University of Johannesburg, Senior Lecturer (and prior Lecturer) at University of Johannesburg as well as Junior Computational Fluid Dynamics (CFD) Analyst at Hatch Africa.

RESEARCH LAB LEADERSHIP

Founder and Principal Investigator, CERG-FLUX Lab (2026–present) Fluids, Learning, and Uncertainty in compleX systems Research subgroup within the Clean Energy Research Group (CERG) Department of Mechanical and Aeronautical Engineering, University of Pretoria

PROFESSIONAL PROFILES

LinkedIn	linkedin.com/in/muaaz-bhamjee-ding-mechanical-preng-000b7212
UP Profile	up.ac.za – Staff Profile
SAAM ExCo	saam.africa/exco

RESEARCH PROFILES

Profile	ID	Link	H-index
Google Scholar	Dr. Muaaz Bhamjee	Link	62
ORCID	0000-0002-2697-4589	Link	N/A
Scopus	55247084100	Link	31
ResearchGate	Muaaz Bhamjee	Link	31
Web of Science	ABE-4708-2020	Link	27

FIELDS OF SPECIALISATION

- Computational Fluid Dynamics (CFD).
- Mechanics (Statics and Dynamics).
- Heat and mass transfer.

- Multiphase flow.
- Navier-Stokes and Lattice Boltzmann based computational methods for modelling fluid flow, heat and mass transfer.
- Numerical analysis.
- Data Science, Machine Learning, Deep Learning.
- Geospatial Data Analysis and Climate Sciences.
- High Performance Computing (HPC) – application of HPC to modelling.
- Solar and Renewable Energy / Solar Air Heating.
- Positron Emission Particle Tracking (PEPT): application and source preparation.
- Course co-ordination and lecturing.
- Scholarship of teaching and learning: Engineering education research with a focus on design literacy, online and blended learning.

PROFESSIONAL SKILLS

- Research and Patent Ideation.
- Significant experience in research environments in academia and in industry.
- Journal and conference paper reviewing.
- Post-graduate supervision.
- Mentoring of Interns and Students.
- Project Management and Leadership.
- Course co-ordination and lecturing; Programme co-ordination.
- Supervision of final year students for their capstone research and design projects.
- Familiar with the engineering consulting and process engineering environments.
- Technical report writing; Teaching academic writing.
- Interpersonal skills; Teamwork and co-ordination; Mentoring.

TECHNICAL SKILLS

- Proficient in Python for data science, machine and deep learning and solving of mathematical problems and general programming.
- Experience with Python-based Machine and Deep Learning Frameworks: PyTorch, TensorFlow and Keras, as well as scikit-learn.
- Geospatial and Climate Data Analysis.
- Computer Science and Software Engineering Skills: DevOps, Agile Development and Scrum, Cloud Computing, Unix/Linux and Shell Scripting, Git and GitHub, Containerisation of applications/software, Kubernetes and OpenShift.
- Proficient with ANSYS Fluent for CFD.
- Proficient with Palabos – open-source libraries for Lattice Boltzmann based approach to CFD.
- Proficient in HPC hardware selection and application of HPC.
- Proficient with Matlab, Simulink, Maxima, GNU Plot, Excel and C++ for solving of mathematical problems and general programming.
- Proficient in LaTeX for general and mathematical typesetting.
- Proficient with Microsoft Office and OpenOffice.

TERTIARY EDUCATION

Doctor of Engineering (DIng Mechanical Engineering Science)
University of Johannesburg 2011–2017
Thesis: Modelling of the Multiphase Interactions in a Hydrocyclone using Navier-Stokes and Lattice Boltzmann based Computational Approaches.
Supervisor: Prof. S.H. Connell (Department of Physics, UJ)
Co-supervisor: Prof. A.L. Nel (Department of Mechanical Engineering Science, UJ)
Link to Thesis

Master of Engineering (MIng Mechanical Engineering Science) – *Cum Laude*

University of Johannesburg 2009–2011
Dissertation: A Computational Fluid Dynamics and Experimental Investigation of an Airflow Window.
Supervisor: Prof. A. Nurick (Department of Mechanical Engineering Science, UJ)
Co-supervisor: Mr. D.M. Madyira (Department of Mechanical Engineering Science, UJ)
Link to Dissertation

BSc Honours (Applied Mathematics) – *Cum Laude*
University of Johannesburg 2008–2010 *Minor Dissertation:* The Link between the Finite Element and Finite Difference Methods for the Poisson Equation.
Supervisor: Dr.
Justin Prentice (Department of Applied Mathematics, UJ)

Bachelor of Engineering (BIng Mechanical Engineering Science)
University of Johannesburg 2004–2008

SECONDARY EDUCATION

RAUCALL Secondary School 1999–2003
Highest Grade Passed: Grade 12 (Matric)
Subjects: English (First Language) HG, Afrikaans (Second Language) HG, Mathematics HG, Accounting HG, Physical Science HG, Economics HG.

EMPLOYMENT HISTORY

Associate Professor February 2023 – Present
University of Pretoria
Line Manager: Prof. Schalk Kok
Co-ordination and lecturing of the third year Impact of Engineering Activity and Group Work (MIA 320) Module. Supervision of final year mechanical engineering students' research and design projects. Supervision of post-graduate students. Research.

Staff Research Scientist February 2023 – December 2024
IBM Research – Africa
Line Managers: Dr. Sibusisiwe A. Makhanya and Dr. Etienne Vos
Conduct Research within the IBM Research Accelerated Discovery Pillar with specific focus on data-driven and machine learning approaches to Climate. Challenge/Project Lead, Patent Ideation, Intern and Student Mentorship.

Senior Research Associate (Visiting) July 2023 – December 2024
University of Johannesburg
Line Managers: Prof. T.C. Jen and Prof. Nkosinathi Madushele
Conduct Research and Post-graduate supervision.

Senior Lecturer May 2017 – January 2023
University of Johannesburg
Line Managers: Prof. E.T. Akinlabi and Prof. T.C. Jen
Co-ordination and lecturing of first year Introduction to Engineering Design 1A and 1B modules. Supervision of final year project investigation and design projects. Supervision/co-supervision of Masters and Doctoral students. Departmental co-ordinator for the First Year Seminar. Departmental software and computer labs co-ordinator. Teaching and learning representative on the Departmental Industry Advisory Board (IAB). Research – Computational Fluid Dynamics (CFD) and engineering education. Former co-ordinator of the Master of Sustainable Energy Programme. Former Departmental short learning programmes (SLPs) co-ordinator.

Lecturer January 2015 – April 2017

University of Johannesburg
Line Manager: Prof. E.T. Akinlabi
Co-ordination and lecturing of first year Introduction to Engineering Design 1A and 1B modules. Supervision of final year project investigation and design projects. Co-supervision of Masters students and research.

Junior Engineer (CFD Analyst) 2008–2009
Hatch Africa Pty (Ltd)
Line Manager: Mr. S. Ritchie
Computational Fluid Dynamics (CFD) modelling for the metals and mineral processing environment. Research of relevant theory, experimental procedures and material properties. Programming of User Defined Functions (C compiler) to improve CFD model accuracy. Technical report writing.

AFFILIATIONS

- Principal Investigator (PI) in the SA-CERN ATLAS Project – University of Pretoria ATLAS CERN Institutional Representative/Team Leader.
- Registered Professional Engineer (PrEng) with the Engineering Council of South Africa (ECSA).
- Full member of the South African Institute of Mechanical Engineering (SAIMechE).
- Full member of the South African Association for Theoretical and Applied Mechanics (SAAM).
- Vice-President of the SAAM Executive Committee (SAAM ExCo).
- Vice-President of the South African National IUTAM (International Union of Theoretical and Applied Mechanics) Committee.
- Former Secretary of the SAAM Executive Committee (SAAM ExCo).
- Former Secretary of the South African National IUTAM Committee.
- Former Full member of the South African Society for Engineering Education (SASEE). Membership concluded in 2023.

GRANTS AND OTHER FUNDING AWARDED

- **2025 – UP Research Development Programme (RDP)**
  Advancing computational techniques for multiphase flow: Lattice Boltzmann, Deep Learning and Quantum Approaches
  Total Value: R50,000
- **2022 – UJ URC Research Equipment Grant**
  Preventing COVID-19 with Mathematical Modelling, Digital twins, AI and 4IR Engineered Solutions
  Total Value: R284,517.15
- **2021 – UJ GES COVID-19 Grant**
  Preventing COVID-19 with Mathematical Modelling, Digital twins, AI and 4IR Engineered Solutions
  Total Value: R80,000
- **2020–2021 – European Synchrotron Radiation Facility (ESRF)**
  Design and study of equipment for the BEATS beamline at SESAME and other equipment for ESRF beamlines
  Total Value: €8,750
- **2017–2019 – NRF Thuthuka Funding Instrument (Post-PhD Track)**
  Modelling of Multiphase Flow in Process Equipment
  Grant Number: TTK160615171464 Total Value: R602,000

Principal Investigator – HPC Projects

- *Multiphase Flow Modelling and Deep Learning*, Project No. MECH1739, Centre for High Performance Computing (CHPC). *Active.*
- *Modelling of Multiphase Flow in Process Equipment*, Project No. MECH0837, CHPC. Concluded 31 January 2023.

- *Preventing COVID-19 with Mathematical Modelling, Digital twins, AI and 4IR Engineered Solutions.* Concluded 31 January 2023.

FORMAL COLLABORATIONS

- *Modelling of Multiphase Flow in Process Equipment* – Collaborator: Multotec. Period: 2017–2019. Status: Concluded.
- *Design and study of the experimental hutch equipment for the BEATS beamline at SESAME* – Collaborator: ESRF. Period: 2020–2022. Status: Concluded.
- *Optimized Heat Transfer for X-Ray Optical Components Designed for High Vibration Stability* – Collaborator: ESRF. Period: 2019–2023. Status: Involvement Ceased.

SCHOLARSHIPS AWARDED

- January 2012 – June 2014: Department of Science and Technology (DST) Innovation Scholarship for Doctoral Study.
- July 2011 – June 2014: University of Johannesburg Next Generation Scholarship for Doctoral study.
- January–June 2011: NRF Extension Scholarship for Masters studies.
- January–March 2011: ENERKEY for Masters Study.
- 2009–2010: Department of Science and Technology (DST) Innovation Scholarship for Masters Study.
- 2009–2010: University of Johannesburg Next Generation Scholarship for Masters studies.
- 2004–2007: Group 5 (Pty) Ltd scholarship for undergraduate studies.

POSTGRADUATE SUPERVISION

Masters – Graduated

- T. Jooma Abbajee, "Reservoir Computing: A Tool for Predicting Chaotic Dynamical Systems", 2026, University of Johannesburg *Co-supervisor.*
- K.M. Makhanya, "The Use of Computational Fluid Dynamics for Assessing Flow-Induced Acoustics to Diagnose Lung Conditions", 2025, University of Johannesburg. *Co-supervisor.*
- T.F. Mokoena, "Design and study of the experimental hutch equipment for the BEATS beamline at SESAME", University of Johannesburg, 2022. Spent six months at the ESRF. *Main Supervisor.*
- T. Ramokoka, "Modelling Fluid and Particulate Flow Through a Ventriculoperitoneal Shunt in a Variable Temperature Environment", University of Johannesburg, 2022. *Main (Sole) Supervisor.*
- T.B. Molale, "Numerical Modelling of a Low-Pressure Steam Turbine's Last Stage Rotating Blade", MEng, University of Johannesburg, 2021. *Co-supervisor.*
- A. Potgieter, "Modelling of a heated gas-solid fluidised bed using Eulerian based models", MEng, University of Johannesburg, 2020. *Cum Laude. Main Supervisor.*
- D.M. Chirnside, "A Numerical Investigation of Air-Core Formation and Particle Separation in a Hydrocyclone", MIng, University of Johannesburg, 2019. *Main (sole) supervisor.*
- S.A.T. Tina, "Design Optimization of a Hydrocyclone: Effect of the Cone Shape on the Hydrocyclone Separation Efficiency", MIng, University of Johannesburg, 2017. *Cum Laude. Co-supervisor.*
- M.S.W. Potgieter, "An Experimental and Computational Fluid Dynamics Investigation of a Counter/Parallel Flow Solar Air Heater", MIng, University of Johannesburg, 2016. *Cum Laude. Co-supervisor.*

Doctoral – Ongoing

- A.Y. Akinbowale, "Quantum Machine Learning for Rare Particle Signatures in High-Dimensional Physics Data", Univerity of Pretoria *Main supervisor.*
- M. Ramokali, "Hybrid classical-quantum computing and machine learning methods for computational fluid dynamics", University of Pretoria. *Main supervisor.*

- M. Takoutchouang Saphira Agnes, "An integrated study of fluid–structure interactions in pathological arteries: development of numerical and experimental models for understanding pathophysiological mechanisms and optimizing methods to improve blood flow accuracy", University of Pretoria. *Main supervisor.*
- M.S.W. Potgieter, "Hybrid Lattice Boltzmann - Machine Learning methods for two-phase flow", Univerisity of Pretoria. *Main supervisor.*
- A. Essop, "A novel numerical scheme for high speed flows", University of Pretoria. *Main supervisor.*
- T. Jooma Abbajee, "Graph dynamical Reservoir Computing", University of Johannesburg *Co-supervisor.*
- M.P. Connell, "Search for Higgs boson decays via dark bosons to a four-lepton final state", University of Johannesburg. *Co-supervisor.*

Masters – Ongoing

- M. Maila, "Modelling of multiphase flow in a hydrocyclone", University of Pretoria. *Main supervisor.*
- B. Kazembe, "Modelling of a heated gas-solid fluidised bed using an Eulerian-Eulerian granular model and a Dense Discrete Phase Model (DDPM)", University of Pretoria. *Main supervisor.*
- M.Y. Rasool, "Searches for BSM Higgs Decay Channels in the ATLAS Experiment at the Large Hadron Collider", University of Pretoria. *Co-supervisor.*

Masters – Supervision Ceased

- Confidence Malatjie, "Computational Fluid Dynamics and Physics Informed Neural Networks", University of Johannesburg – Applied Mathematics. *Co-supervisor. Supervision Ceased February 2026.*

Doctoral – Supervision Ceased

- I. Makani, "Characterization of hydrochar prepared from food waste for the adsorption of H_2S from biogas using deep learning, experiment and techno-economic analysis", University of Pretoria. *Co-supervisor. Supervision Ceased November 2025.*
- M.T.L. Lekwana, "Computational Fluid Dynamics Study of Hemodynamics in the Human Cardiovascular System", University of Johannesburg. *Main supervisor. Supervision Ceased January 2023.*
- A. Potgieter, "Optimized Heat Transfer for X-Ray Optical Components Designed for High Vibration Stability", University of Grenoble-Alpes (UGA) / ESRF. *Co-supervisor. Supervision Ceased February 2023.*

ATLAS Authorship Qualification Task (AQT) – Local Supervision

- M.P. Connell, "Computational Fluid Dynamics Modelling of the N_2 Purging Flow Field, Temperature, Humidity and Dew Point Distributions in the Inner Pixels for the ATLAS ITk Upgrade" – Completed 1 March 2022. *Local Supervisor.*
- P. Mafa Takisa, "Computational Fluid Dynamics Modelling of the Flow Field, Temperature, Humidity and Dew Point Distributions in the Outer Service Volume (OSV) for the ATLAS ITk Upgrade" – Supervision Ceased 31 January 2023. *Local Supervisor.*

Mentorship

- Raees Ebrahim Moosa, IBM Research – Africa Mentorship Programme, BSc Honours Computer Science, University of Witwatersrand. Period: April 2024 – Present.
- R. Seipei, IBM Research Africa – Intern. Period: April – October 2023.

- Raees Ebrahim Moosa, IBM Research – Africa Mentorship Programme, BSc Computer Science, University of Witwatersrand. Period: April – October 2023.

JOURNAL PUBLICATIONS

(Accredited Journals. Select ATLAS/CERN papers listed below – see Google Scholar and Scopus profiles for the full list of 200+ publications.)

Non-ATLAS Journal Papers

- Khanyisani Mhlangano Makhanya and Muaaz Bhamjee and Neil Martinson and Simon Connell, "Assessment and characterization of the impact of pulmonary pathology on flow-induced acoustics using computational fluid dynamics", *Biomedical Signal Processing and Control*, vol. 120, pp. 110018, 2026. DOI
- Ralijaona, Mbolahasina and Igumbor, Emmanuel and Bhamjee, Muaaz and Otwombe, Kennedy and Nabeemeeah, Firdaus and Milovanovich, Minja and Martinson, Neil and Mafa, Pedro and Leeuw, Lerothodi and Connell, Simon, "Infectiousness model of expelled droplets exposed to ultraviolet germicidal irradiation coupled with evaporation", *Computers & Fluids*, vol. 275, pp. 106242, 2024. DOI
- Mokoena, Fortune and Bhamjee, Muaaz and Connell, Simon H. and Van Vaerenbergh, Pierre and Iori, Gianluca and Kaprolat, Axel, "An FEA Investigation of the Vibration Response of the BEATS Detector Stage", *R&D Journal of the South African Institution of Mechanical Engineering*, vol. 39, pp. 44–52, 2023. DOI
- Makhanya, K. M. and Connell, S. H. and Bhamjee, Muaaz and Martinson, N. A., "The Use of Computational Fluid Dynamics for Assessing Flow-Induced Acoustics to Diagnose Lung Conditions", *Mathematical and Computational Applications*, vol. 28, No. 3, pp. 64, 2023. DOI
- Bhamjee, Muaaz and Connell, Simon H. and Nel, André Leon, "The Modification of the Dynamic Behaviour of the Cyclonic Flow in a Hydrocyclone under Surging Conditions", *Mathematical and Computational Applications*, vol. 27, No. 6, pp. 88, 2022. DOI
- Potgieter, A. and Bhamjee, M. and Kruger, S., "Modelling of a Heated Gas-solid Fluidised Bed using Eulerian Based Models", *R&D Journal of the South African Institution of Mechanical Engineering*, vol. 37, pp. 45–57, 2021. DOI
- Potgieter, M. S. W. and Bester, C. R. and Bhamjee, M., "Experimental and CFD Investigation of a Hybrid Solar Air Heater", *Solar Energy*, vol. 195, pp. 413–428, 2020. Impact Factor: 5.742. DOI
- Coetzee, Rigardt Alfred Maarten and Jen, Tien-Chien and Bhamjee, Muaaz and Lu, Junling, "The mechanistic process analysis and temperature effect in a low pressure square type atomic layer deposition reactor", *International Journal of Mechanical Engineering and Robotics Research*, vol. 8, No. 5, pp. 792–796, 2019. DOI
- Coetzee, Rigardt Alfred Maarten and Jen, Tien-Chien and Bhamjee, Muaaz and Lu, Junling, "The mechanistic effect over the substrate in a square type atomic layer deposition reactor", *International Journal of Modern Physics B*, vol. 33, No. 01n03, pp. 1940018, 2019. DOI
- Bhamjee, M. and Nurick, A. and Madyira, D. M., "An Experimentally Validated Mathematical and CFD Model of a Supply Air Window: Forced and Natural Flow", *Energy and Buildings*, vol. 57, pp. 289–301, 2013. Impact Factor: 5.879. DOI

Select ATLAS/CERN Collaboration Papers

Note: Only a selection is listed. See Google Scholar and Scopus profiles for the complete list.

- ATLAS Collaboration, "Measurements of W^+W^- production cross-sections in pp collisions at $\sqrt{s}$ = 13 TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2025, No. 8, pp. 1–66, 2025.
- ATLAS Collaboration, "The performance of missing transverse momentum reconstruction and its significance with the ATLAS detector using 140 fb^{-1} of $\sqrt{s}$ = 13 TeV pp collisions", *The European Physical Journal C*, vol. 85, No. 6, pp. 606, 2025.

- ATLAS Collaboration, "Differential cross-section measurements of Higgs boson production in the $H \to \tau^+\tau^-$ decay channel in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2025, No. 3, pp. 1–66, 2025.
- ATLAS Collaboration, "Search for diphoton resonances in the 66 to 110 GeV mass range using pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2025, No. 1, pp. 53, 2025. DOI
- ATLAS Collaboration, "", *Physical Review Letters*, vol. 134, No. 14, 2025.
- ATLAS Collaboration, "Exploration at the high-energy frontier: ATLAS Run 2 searches investigating the exotic jungle beyond the Standard Model", *Physics Reports*, vol. 1116, pp. 301–385, 2025.
- ATLAS Collaboration, "The quest to discover supersymmetry at the ATLAS experiment", *Physics Reports*, vol. 1116, pp. 261–300, 2025.
- ATLAS Collaboration, "Characterising the Higgs boson with ATLAS data from the LHC Run-2", *Physics Reports*, vol. 1116, pp. 4–56, 2025.
- ATLAS Collaboration, "Climbing to the Top of the ATLAS 13 TeV data", *Physics Reports*, vol. 1116, pp. 127–183, 2025.
- ATLAS Collaboration, "Software and computing for Run 3 of the ATLAS experiment at the LHC", *The European Physical Journal C*, vol. 85, No. 3, pp. 234, 2025.
- ATLAS Collaboration, "Observation of quantum entanglement with top quarks at the ATLAS detector", *Nature*, vol. 633, No. 8030, pp. 542–547, 2024.
- ATLAS Collaboration, "Observation of $W\gamma\gamma$ triboson production in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Physics Letters B*, vol. 848, pp. 138400, 2024.
- ATLAS Collaboration, "Observation of electroweak production of W^+W^- in association with jets in proton-proton collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 7, 2024.
- ATLAS Collaboration, "Combination of searches for Higgs boson pair production in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Physical Review Letters*, vol. 133, No. 10, pp. 101801, 2024.
- ATLAS Collaboration, "Determination of the relative sign of the Higgs boson couplings to W and Z bosons using WH production via vector-boson fusion with the ATLAS detector", *Physical Review Letters*, vol. 133, No. 14, pp. 141801, 2024.
- ATLAS Collaboration, "Combination and summary of ATLAS dark matter searches interpreted in a 2HDM with a pseudo-scalar mediator using 139 fb^{-1} of $\sqrt{s} = 13$ TeV pp collision data", *Science Bulletin*, vol. 69, No. 19, pp. 3005–3035, 2024.
- ATLAS Collaboration, "The ATLAS experiment at the CERN Large Hadron Collider: a description of the detector configuration for Run 3", *Journal of Instrumentation*, vol. 19, No. 05, pp. P05063, 2024.
- ATLAS Collaboration, "The ATLAS trigger system for LHC Run 3 and trigger performance in 2022", *Journal of Instrumentation*, vol. 19, No. 06, pp. P06029, 2024.
- ATLAS Collaboration, "Measurement of ZZ production cross-sections in the four-lepton final state in pp collisions at $\sqrt{s} = 13.6$ TeV with the ATLAS experiment", *Physics Letters B*, vol. 855, pp. 138764, 2024.
- ATLAS Collaboration, "Measurement and interpretation of same-sign W boson pair production in association with two jets in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 4, 2024.
- ATLAS Collaboration, "Measurement of the Z boson invisible width at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Physics Letters B*, vol. 854, pp. 138705, 2024.
- ATLAS Collaboration, "Inclusive and differential cross-section measurements of $t\bar{t}Z$ production in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector, including EFT and spin-correlation interpretations", *Journal of High Energy Physics*, vol. 2024, No. 7, 2024.
- ATLAS Collaboration, "Electron and photon efficiencies in LHC Run 2 with the ATLAS experiment", *Journal of High Energy Physics*, vol. 2024, No. 5, 2024.

- ATLAS Collaboration, "Measurement of t-channel production of single top quarks and antiquarks in pp collisions at 13 TeV using the full ATLAS Run 2 data sample", *Journal of High Energy Physics*, vol. 2024, No. 5, 2024.
- ATLAS Collaboration, "Software performance of the ATLAS track reconstruction for LHC Run 3", *Computing and Software for Big Science*, vol. 8, No. 1, pp. 9, 2024.
- ATLAS Collaboration, "A precise measurement of the Z-boson double-differential transverse momentum and rapidity distributions in the full phase space of the decay leptons with the ATLAS experiment at $\sqrt{s} = 8$ TeV", *The European Physical Journal C*, vol. 84, No. 3, pp. 315, 2024.
- ATLAS Collaboration, "Measurement of the production cross-section of J/ψ and $\psi(2S)$ mesons in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *The European Physical Journal C*, vol. 84, No. 2, pp. 169, 2024.
- ATLAS Collaboration, "Search for resonant production of dark quarks in the dijet final state with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 2, 2024.
- ATLAS Collaboration, "Studies of new Higgs boson interactions through nonresonant HH production in the $b\bar{b}\gamma\gamma$ final state in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 1, pp. 66, 2024.
- ATLAS Collaboration, "Differential cross-section measurements of the production of four charged leptons in association with two jets using the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 1, pp. 4, 2024.
- ATLAS Collaboration, "Simultaneous energy and mass calibration of large-radius jets with the ATLAS detector using a deep neural network", *Machine Learning: Science and Technology*, vol. 5, No. 3, pp. 035051, 2024.
- ATLAS Collaboration, "Search for new phenomena with top-quark pairs and large missing transverse momentum using 140 fb^{-1} of pp collision data at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 3, 2024.
- ATLAS Collaboration, "", *Physical Review Letters*, vol. 132, No. 10, 2024.
- ATLAS Collaboration, "Search for a CP-odd Higgs boson decaying into a heavy CP-even Higgs boson and a Z boson in the $\ell^+\ell^- t\bar{t}$ and $\nu\bar{\nu}b\bar{b}$ final states using 140 fb^{-1} of data collected with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 2, 2024.
- ATLAS Collaboration, "Search for the Exclusive W Boson Hadronic Decays $W^\pm \to \pi^\pm\gamma$, $W^\pm \to K^\pm\gamma$ and $W^\pm \to \rho^\pm\gamma$ with the ATLAS Detector", *Physical Review Letters*, vol. 133, No. 16, pp. 161804, 2024.
- ATLAS Collaboration, "Measurement of the W-boson mass and width with the ATLAS detector using proton–proton collisions at $\sqrt{s} = 7$ TeV", *The European Physical Journal C*, vol. 84, No. 12, pp. 1309, 2024.
- ATLAS Collaboration, "Interpretations of the ATLAS measurements of Higgs boson production and decay rates and differential cross-sections in pp collisions at $\sqrt{s} = 13$ TeV", *Journal of High Energy Physics*, vol. 2024, No. 11, pp. 97, 2024.
- ATLAS Collaboration, "Combination of searches for heavy spin-1 resonances using 139 fb^{-1} of proton-proton collision data at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 4, 2024.
- ATLAS Collaboration, "Search for pair-production of vector-like quarks in lepton+jets final states containing at least one b-tagged jet using the Run 2 data from the ATLAS experiment", *Physics Letters B*, vol. 854, pp. 138743, 2024.
- ATLAS Collaboration, "Combination of searches for pair-produced leptoquarks at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Physics Letters B*, vol. 854, pp. 138736, 2024.
- ATLAS Collaboration, "Search for short- and long-lived axion-like particles in $H \to aa \to 4\gamma$ decays with the ATLAS experiment at the LHC", *The European Physical Journal C*, vol. 84, No. 7, pp. 742, 2024.
- ATLAS Collaboration, "Combination of searches for resonant Higgs boson pair production using pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Physical Review Letters*, vol. 132, No. 23, pp. 231801, 2024.

- ATLAS Collaboration, "Electron and photon energy calibration with the ATLAS detector using LHC Run 2 data", *Journal of Instrumentation*, vol. 19, No. 02, pp. P02009, 2024.
- ATLAS Collaboration, "Search for electroweak production of supersymmetric particles in final states with two τ-leptons in $\sqrt{s} = 13$ TeV pp collisions with the ATLAS detector", *Journal of High Energy Physics*, vol. 2024, No. 5, 2024.
- ATLAS Collaboration, "Performance and calibration of quark/gluon-jet taggers using 140 fb^{-1} of pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector", *Chinese Physics C*, vol. 48, No. 2, pp. 023001, 2024.
- ATLAS Collaboration, "Probing the CP nature of the top–Higgs Yukawa coupling in $t\bar{t}H$ and tH events with $H \to b\bar{b}$ decays using the ATLAS detector at the LHC", *Physics Letters B*, vol. 849, pp. 138469, 2024.
- ATLAS Collaboration, "Search for pair-produced higgsinos decaying via Higgs or Z bosons to final states containing a pair of photons and a pair of b-jets with the ATLAS detector", *Physics Letters B*, vol. 856, pp. 138938, 2024.
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Inventors: Akhalwaya, Ismail Yunus and Vos, Etienne Eben and Makhanya, Sibusisiwe Audrey and Govindasamy, Tamara Rosemary and Patel, Zubeida and Morake, Dedricks Monyai and Mahlasi, Craig and Bhamjee, Muaaz.
Inventors on behalf of IBM Corp. South Africa: Granted 30 July 2024, ZA2023/09448 (ID: 99151468). USA: Pending, US18/200,050. Link

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- *Energy and Buildings* – Elsevier
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- *Environmental Science and Pollution Research* – Springer
- *SAIEE Africa Research Journal* (special issue)
- *JOM – Journal of The Minerals, Metals & Materials Society (TMS)* (special issue)
- *Applied Energy* – Elsevier
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- Reviewer: *SAIP 2025* (69th Annual Conference); *SACAM 2025* (14th Conference)
- Reviewer: *ICLR 2024* – Three workshop proposals reviewed.
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- Abstract reviewer: *2nd Biennial SOTL in the South Conference*, Bloemfontein, October 2019
- Reviewer: *SMPM 2019*, North West, 8–10 March 2019
- Reviewer: *SACAM 2018*, Vanderbijlpark, 17–19 September 2018
- Reviewer: *SACAM 2012*, Johannesburg, 3–5 September 2012

MEMBER OF CONFERENCE ORGANISING COMMITTEES

- Member of the Local Organising Committee for the *7th Biennial "Workshop on Discovery Physics at the LHC" (Kruger2026) Conference* – Hosted by SA-CERN.
- Member of the Local Organising and Scientific Committee for the *2025 SAIMechE Central Branch Conference on Mechanical Engineering and Related Disciplines* – Hosted by Wits University.
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