Shimaa ABUZEID
Associate Professor of Physics

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Education:

2013 – 2018 ***Double-Degree of Ph.D. Ph.D. in Science - Vrije Universiteit Brussel – Brussels, Belgium. Ph.D. in Nuclear Physics - Ain Shams University – Cairo, Egypt.***
"Search for Top Quark Flavour Changing Neutral Couplings with the CMS Experiment at the LHC", http://cds.cern.ch/record/002636540?ln=en

2018 ***Doctoral Training Programme***
Doctoral school of Natural sciences and (Bioscience) Engineering - Vrije Universiteit Brussel (VUB) – Brussels, Belgium.
The certification of completing 60 credits of different training courses during the PhD period that are organized by the Doctoral School of Natural sciences and (Bioscience) Engineering at VUB.

2008 - 2011 ***Master of Science in Experimental Nuclear Physics.***
Faculty of Women for Arts, Science and Education - Ain Shams University – Cairo, Egypt.
The thesis entitled "Investigation of Charged Particles Induced Nuclear Reactions on Some Medium Weight Nuclei".

2001 - 2005 ***Bachelor of Science in Physics*** - Faculty of Women for Arts, Science and Education - Ain Shams University – Cairo, Egypt.

Experience:

A. Academic Career Path

Jan. 2026 - **Member of CMS-DMOC** (Diversity Monitoring and Oversight Committee) for the CMS experiment at CERN (Tenure end date Dec. 2027)

Oct. 2026 - **Member of International Committee of CMS** experiment at CERN (Tenure end date Aug. 2027)

Feb. 2025 – Present ***Postdoctoral Researcher*** **at INFN (Pavia section) – Italy.**
- CMS-GEM TC deputy (L2 position) until Oct. 2025
- CMS-GEM L3 position – Responsibility of the power system for GEM detectors

Aug. 2026 - present ***Associate Professor of Physics (Experimental High Energy & Particle Physics)***
Faculty of Women for Arts, Science and Education - Ain Shams University – Cairo, Egypt

Oct. 2018 – July 2026 ***Assistant Professor of Physics***
Faculty of Women for Arts, Science and Education - Ain Shams University – Cairo, Egypt.
- Teaching physics courses for undergraduate/postgraduate students (Experimental Nuclear and High energy particle Physics - General Physics).
- Supervising undergraduate/graduate students in their BSc, MSc & PhD research.

Oct. 2018 – Jan. 2025 ***A council member of the Egyptian Network of High Energy Physics (ENHEP) – Academy of Scientific Research and Technology – Cairo, Egypt.***
- CMS-GEM L3 position – Responsibility of the power system for GEM detectors.

Oct. 2021 – Oct. 2023 ***Postdoctoral Research Fellow*** **at INFN (Pavia section) – Italy.**
- CMS-GEM L3 position – Responsibility of the power system for GEM detectors.

Mar. 2020 – Dec. 2020 ***Postdoctoral Physicist at CMS experiment – CERN – Geneva, Switzerland.***
I had the responsibility of the power supply systems of the GEM detector within the CMS experiment.

May 2019 – May 2020 ***Postdoctoral Researcher*** **-** Center of Fundamental Physics (CFP) – Zewail City for Science & Technology, Egypt.
- Searching for new physics phenomena with the CMS experiment. Mentoring 3 master's & PhD students.

2007 – 2018 ***Teaching Assistant of Physics***
Teaching experiments in Physics labs – Faculty of Women for Arts, Science and Education - Ain Shams University – Cairo, Egypt.

B. Publications

I have been a co-author of CMS physics papers since 2015, with more than 650 peer-reviewed articles and Scopus h-index = 80. The updated list of papers can be found here:

- Scopus: https://www.scopus.com/authid/detail.uri?authorId=56682042700
- ORCID: https://orcid.org/0000-0002-0820-0483
- INSPIRE-HEP: https://inspirehep.net/authors/1261899?ui-citation-summary=true

Some Selected Publications

2024 **"Measurement of the background in the CMS muon detector in pp collisions at √s = 13 TeV"** - CMS Muon Group (S. AbuZeid). Eur. Phys. J. C (2024) 84:955 DOI: https://doi.org/10.1140/epjc/s10052-024-13077-x

2023 **"Production and validation of industrially produced large-sized GEM foils for the Phase-2 upgrade of the CMS muon spectrometer"** M. Abbas et al., (S. AbuZeid) - Nuclear Inst. and Methods in Physics Research, A, Volume 1057, 168723 December 2023, DOI: https://doi.org/10.1016/j.nima.2023.168723

"**Impact of magnetic field on the stability of the CMS GE1/1 GEM detector operation**", M. Abbas, et al., JINST, V18, https://doi.org/10.1088/1748-0221/18/11/P11029 .

2022 "**Quality control of mass-produced GEM detectors for the CMS GE1/1 muon upgrade**", M. Abbas, et al., Nuclear Inst. and Methods in Physics Research, A , V1034, https://doi.org/10.1016/j.nima.2022.166716 .

2021 "**Benchmarking LHC background particle simulation with the CMS triple-GEM detector**", M. Abbas, et al., Journal of Instrumentation (JINST), V16, https://doi.org/10.1088/1748-0221/16/12/P12026.

2020 "**Performance of prototype GE1/1 chambers for the CMS muon spectrometer upgrade**", M. Abbas, et al., Nuclear Inst. and Methods in Physics Research (A), V972, (arXiv:1903.02186v2), https://doi.org/10.1016/j.nima.2020.164104.

2018 "**Search for the flavor-changing neutral current interactions of the top quark and the Higgs boson which decays into a pair of b quarks at √s = 13 TeV**" - CMS Collaboration DOI: https://doi.org/10.1007/JHEP06(2018)102

"**Identification of heavy-flavour jets with the CMS detector in pp collisions at 13 TeV**" - CMS Collaboration DOI: https://doi.org/10.1088/1748-0221/13/05/P05011

2012 **"Excitation Functions of Deuteron Induced Nuclear Reactions on Iron"** - ABU ZEID, Sh., Abd El Wahab, M., Al-Abyad, M., Seddik, U., Arab Journal of Nuclear Sciences and Applications, 45(1) (2012) 129-140. https://inis.iaea.org/search/search.aspx?orig_q=RN:43018723

Awards

- **"2025 Breakthrough Prize in Fundamental Physics"**

"For detailed measurements of Higgs boson properties confirming the symmetry-breaking mechanism of mass generation, the discovery of new strongly interacting particles, the study of rare processes and matter-antimatter asymmetry, and the exploration of nature at the shortest distances and most extreme conditions at CERN's Large Hadron Collider" using data collected during LHC Run 2.

- **International Publication Awards** from Ain Shams University for a group of research papers published in peer-reviewed international journals for batches (28, 29, 30, 31, 32, 33) for years 2021 to 2025.

- **"The best PhD thesis award - 2018"** from Faculty of Women for Arts, Science & Education – Ain Shams University – Cairo – Egypt.

C. Professional Service

C.1 Journal Reviewing:

- Reviewer at Nuclear Inst. and Methods in Physics Research, A.
- Reviewer at Journal of Instrumentation (JINST).

2022 Reviewer of the Proceedings of SAIP2022, the 66th Annual Conference of the South African Institute of Physics - ISBN: 978-0-6397-4426-1

2021 Reviewer of the Proceedings of SAIP2021, the 65th Annual Conference of the South African Institute of Physics - ISBN: 978-0-620-97693-0

C.2. Reviewing and Examination of PhD & MSc Candidates

Aug. 2024 **PhD** thesis submitted by **Benjamin Lieberman** entitled: "**The Use of Semi-Supervised Machine Learning Techniques in the Search for New Bosons with the ATLAS Detector" -** Faculty of Science - University of the Witwatersrand, Johannesburg - South Africa

Jun. 2024 **PhD** thesis submitted by **Ryan Mckenzie** entitled: **Development and Reliability Testing of a new Low-Voltage Power Supply for the ATLAS Hadronic Tile-Calorimeter Phase-II Upgrade** - Faculty of Science - University of the Witwatersrand, Johannesburg - South Africa.

Apr. 2024 **MSc** dissertation **submitted** by **Anza-Tshilidzi Mulaudzi** entitled: "**Exploring the 95GeV Excess with Extended Scalar Models"**

Nov. 2022 **MSc** dissertation **submitted** by **Elias Malwa** entitled: "**Connecting the multi-lepton anomalies at the LHC and leptophilic excesses in astrophysics"**

Mar. 2022 **PhD** thesis submitted by **Esra Mohammed Shrif Mohammed Salih** entitled: **"Search for a heavy resonance decaying into two photons in association with b-jets with the ATLAS detector and constraints on a 2HDM+S model**" - Faculty of Science - University of the Witwatersrand Johannesburg - South Africa.

D. Training, Workshops and Conferences

Nov. 2026 ***Participation in "Joint ICTP-IAEA Workshop on Nuclear Reaction Data: Experiment and Compilation" November 2-6, 2026 - ICTP - Trieste - Italy***
https://indico.ictp.it/event/11170/overview
Compiled nuclear data from 2 published articles into EXFOR and presented a poster entitled ***"****Deuteron-Induced Reactions on Natural Iron Near the Reaction Threshold: Updated Measurements and EXFOR Compilation".*

Oct. 2026 ***Participation/ Poster in "Career Development Workshop for Women in Physics" - October 12-16 - ICTP - Trieste - Italy https://indico.ictp.it/event/11308/overview***

Aug. 2026 ***Speaker/ participation in "15th LHC Physics School" August 17 - 28, 2026 - Islamabad - Pakistan https://www.ncp.edu.pk/slp-2026.php***
Gave 5 lectures covering particle detector technologies & particle reconstruction in HEP

Oct. 2025 ***Speaker/Participation in "2025 Annual Review of the Phase-II Muon Upgrade" – CMS Experiment – 15th Oct. 2025 - CERN.***
*Talk on behalf of CMS GEM muon group entitled "*ME0 project status"

May 2025 ***Speaker/ Participation in "One Day International Hybrid Conference on Emerging Trends in Physics"- 21st May 2025 - Department of Particle Physics, Institute of Physics (iOP), Islamia University of Bahawalpur, Pakistan.***
Talk entitled "Top Quark Flavour Change Couplings within Particle Colliders"

Apr. 2025 ***- Speaker/ Participation in "the CMS Upgrade week" – 7th - 11th Apr. 2025 – CERN.***
Talk on behalf of CMS GEM muon group entitled: "*Decommission of CMS-UXC GEM-muon Detector****".***

- Speaker/ Participation in "33rd GEM Workshop" – 14th - 16th Apr. 2025 – CERN.
Talk on behalf of CMS GEM-TC group entitled: "*Preparation of GEM-muon Detector for LS3****".***

Mar. 2025 ***Organizer/ Participation in the "32nd International Workshop on Deep Inelastic Scattering and Related Subjects (DIS2025)" – Cape Town – South Africa.***
Abstract on behalf of CMS muon group entitled: "*The CMS Muon System Upgrades for the HL-LHC****".***

Sep. 2023 ***Organizer/ Speaker and convener of the 6th International Conference on Technology and Instrumentation in Particle Physics (TIPP2023) – Cape Town – South Africa.***
Talk on behalf of CMS muon group entitled: "*The Power System of GEM-Muon Sub-detector for CMS Phase-II upgrade****". Chairing 3 parallel sessions.***

Jan. 2023 ***Participant in "CMS Upgrade Days" – CERN.***
Poster entitled "*The Low Voltage Power System of GE2/1 and ME0 for GEM Phase-II upgrade****".***

Sep. 2022 ***A speaker in "ME0 Integration Camp and Construction Readiness Workshop" – CERN.***
2 Presentations entitled "The GEM-ME0 LV system***" and "***The mapping of GEM-ME0 LV system at P5***".***

May 2022 ***A speaker in "31st GEM Workshop" – CERN.***
Presentation entitled "*The GEM DCS HV-Extension****".***

Mar. 2022 ***A speaker in "10th Annual Ain Shams University International Congress 2022" – Cairo – Egypt.***
Presentation entitled "*GEM Technology for Muons Detection within CMS Experiment at CERN****".***

Mar. 2022 ***Co-Organizer and Co-chairing of "First Pan-African Astro-Particle and Collider Physics Workshop" – (Fully Virtual).***

D. Training, Workshops and Conferences (continue)

May 2020 ***A speaker in "GEM Phase 2 Upgrade Workshop (GE2/1 & ME0)" – CERN (Virtual due to COVID-19).***
Presentation entitled "*GE2/1 and ME0 Low-Voltage (LV) Power Systems****"***

Jan. 2020 ***Organization & Participation in "International Conference on Neutrinos and Dark Matter (NDM-2020)" –*** **Hurghada, Egypt.**

Apr. 2019 ***A speaker in "the 8th Annual ASU scientific conference" –*** **Cairo, Egypt.**
Presentation entitled "*Particle Physics Research at CERN****"***

Mar. 2019 ***A speaker in "the 3rd international conference for women in Science Network" - World forum for women in science –*** **Cairo, Egypt.**
Presentation entitled "Top quark Physics with the CMS Experiment at the LHC"

Jan. 2019 ***Participation/Organization of "The 7th ENHEP (Egyptian Network of High Energy Physics) School for high-energy physics" -*** **Cairo, Egypt.**

2016 ***A speaker in the "Top FCNC mini-workshop 2016" –*** Eguisheim, France. *Presentation entitled "Flavor Changing Neutral Currents in the decay of a top-quark pair to Higgs boson and a (u/c) quark."*

2014 & 2016 ***Participation in the "7th & 9th International Workshops on Top Quark Physics (Top2014 - TOP2016)" -*** **Cannes, France & Olomouc, Czech Republic respectively.**

2015 ***A speaker in the "Brussels-Strasbourg-CBNU top quark physics workshop on FCNC" -*** Chonbuk National University, South Korea.
Presentation entitled "Flavor Changing Neutral Currents in top-quark pair decay with same-sign di-lepton final states."

2014
2015 ***Participation in the "Belgian-Dutch-German summer schools (BND 2014) and (BND 2015)"***

Organizational/ managerial skills

2011 - 2013 **The official representative of Teaching Assistants in the faculty board** in the Faculty of Women for Arts, Science and Education – Ain Shams University – Cairo, Egypt.

2008 - 2009 **Co-organizer of two regional scientific conferences in the Middle East -** Ain Shams University – Cairo, Egypt.

Outreach

- **Interviews for newspapers, TV and radio**

Some interviews with BBC (Arabic), SkyNews (Arabic), Nile-TV International & other Egyptian /Arabic Journals, TV and Radio channels concerning science and/or women role models in the Middle East.
https://www.youtube.com/channel/UCWNtgWOEOqlWtk8VdiA3dgQ

- **Public talks about physics & CERN in NGO associations** for young students in Egypt & Arabic speaking countries (Volunteering work).

- **Organizing and guiding virtual (live) visits to the CMS experiment at CERN for different universities in Egypt and Middle East.**

Professional skills

- ***I am a technical DCS-Central, GEM-DCS and GEM-DOC (on call) shifter, Shift-Leader and guide in the CMS experiment at CERN***. *Responsibility for controlling the CMS detector during operation, and providing a safer environment during the daily activities at CMS experiment. Also a guide for public visitors to the CMS experiment.*
- ***I am authorized (with B2V Electrical accreditation) to work with low-voltage setups.***
- ***I am authorized to drive and work on mobile elevating working platforms.***
- ***I am an authorized first aider.***

Computer skills

- Proficient in Machine Learning, Geant4
- Programming with C++ & Python.
- Experienced in WinCC OA and JCOP framework for Detector Control System (DCS) development.
- Writing with LaTeX.