

Ahmed Rashed

CURRICULUM VITAE

1 Education

1. **Postgraduate Program (2021 - 2022)**
Institution: University of Texas at Austin
Major: Artificial Intelligence and Machine Learning
2. **Data Science Program (2020-2021)**
Institution: Simplilearn Company
3. **Ph.D. (2009 - 2014)**
Institution: University of Mississippi.
Major: Theoretical Particle Physics.
Supervisor: Alakabha Datta .
4. **M.A. (2009 - 2011)**
Institution: University of Mississippi.
Major: Physics.
5. **Diploma (2007 - 2008)**
Institution: African Institute for Mathematical Science (AIMS).
Major: Mathematical Science and Theoretical Physics.
6. **M.Sc. (2002 - 2006)**
Institution: Ain Shams University.
Major: Theoretical Physics.
7. **B.Sc. (1996 - 2000)**
Institution: Ain Shams University.
Major: Physics.

2 Employment History

1. **Assistant professor (tenure track)**, Shippensburg University of Pennsylvania, USA, 2017 -
2. **Adjunct faculty**, University of Mississippi, USA, Summer 2017.
3. **Visiting assistant professor**, Delta State University, USA, 2016 - 2017.
4. **Adjunct instructor**, Northeast Mississippi Community College, USA, 2016-2017.
5. **Postdoctoral research associate**, University of Mississippi, USA, 2015 - 2016.
6. **Postdoctoral research associate**, Zewail City of Science and Tech, 2014 - 2015.
7. **Assistant professor**, Ain Shams University, 2014 - 2015.

8. **Adjunct instructor**, Northwest Mississippi Community College, USA, Fall 2013.
9. **Teaching/Research assistant**, University of Mississippi, USA, 2009 - 2014.
10. **Assistant lecturer**, Ain Shams University, 2000 - 2007.

3 Areas of Teaching Competency

- All introductory physics courses
- Theoretical Physics courses
- Computational Physics
- Astronomy

4 Repetitive Ongoing Teaching at Shippensburg

4.1 Regular Courses

- Intro Physics I (PHY121)
- Astronomy (PHY108)
- Physics I Lab (PHY123)
- Physics for Society (PHY110)
- Math and Num Techniq (PHY301)
- Physics II Lab (PHY125)
- Computational Physics (PHY 471)
- Fund. of Physics I (PHY221)
- Mechanics II (PHY431)
- Intermed. Physics I (PHY205)
- Mechanics I (PHY331)

4.2 Volunteer teaching at Ship

I taught particle physics lectures to my research students in order to prepare them for the research in theoretical high energy physics. The lecture series extended to 9 meetings with 2 hours each in average.

5 Courses Taught at Other Institutions

Summer I 2016-2017	University of Mississippi, Physics for Science & Engineering (Phys 211) “16 students”.
Summer II 2016-2017	University of Mississippi, Physics for Science & Engineering (Phys 212) “32 students”.
Fall/Spring 2016-2017	Delta State University, Physics of Sound PHY-210.
Fall/Spring 2016-2017	Delta State University, Astronomy (On-line) PHY-105.
Fall/Spring 2016-2017	Delta State University, Physics for Life Sciences w/ Labs.
Fall 2016-2017	Northeast Mississippi Community College, Physical Science (On-line) PHY 2244.
Fall 2016-2017	University of Mississippi, Physical Theory (Phys 303), co-instructed.
Summer 2015-2016	University of Mississippi, Physics for Science & Engineering (Phys 212) “30 students”.
Summer 2015-2016	University of Mississippi, Recitation sessions for graduate students to preparing for the electrodynamics comprehensive exam (Classical Electrodynamics, Jackson).
Spring 2015-2016	University of Mississippi, Physics for Science & Engineering (Phys 212) “90 students”.
Spring 2015-2016	University of Mississippi, Mathematical Physics (Phys 308).
Spring 2013-2014	University of Mississippi, Electromagnetic II (Phys 402).
Fall 2013-2014	University of Mississippi, Electromagnetic I (Phys 401).
Fall 2013-2014	Northwest Mississippi Community College, Physical Science I (PHY2243 50), co-instructed.
2012-2013	University of Mississippi, I taught some classes as an assistant in Quantum Mechanics I (Phys 611) and Senior Review (Phys 498).

6 Curriculum/Course Development

I developed informal lectures in particle physics to the students who are interested in doing research in high energy physics. I developed this course in a compact and short series of lectures. Because students do not have any background in particle physics, I have had to start with them from the basics in the field. I taught the fundamentals of particle physics and covered the main techniques used in the research to develop their mathematical skills to be able to tackle a research problem in the field. In result of that, a research paper is finished and sent for publication in an international peer reviewed journal. The second project is still in progress.

7 Computer Skills

7.1 Programming Languages

Python and R

7.2 Data Analysis Techniques (Machine Learning)

1. Machine Learning Algorithm
2. Supervised Learning Linear Regression
3. Supervised Learning Logistic Regression (Classification, Decision Tree)
4. Ensemble Techniques
5. Model Tuning
6. Unsupervised Learning (Clustering)
7. Neural Networks
8. Model Deployment
9. Statistical Learning

7.3 Research Computer Skills

1. Mathematica
2. FeynCalc, CalcHEP, FeynArt, SARAH, FeynRules,
3. Flavio
4. MadGraph, Pythia, Delphes, SPheno, MadAnalysis

8 Evidence of Publication and/or Juried Presentations

8.1 Peer-Reviewed publications

1. A. Hammad, A. Rashed and S. Moretti, “The Dark Z' and Sterile Neutrinos Behind Current Anomalies,” [[arXiv:2110.08651](#)] [[hep-ph](#)].
2. S. Antusch, A. Hammad and A. Rashed, “Searching for charged lepton flavor violation at ep colliders,” **JHEP** **03**, **230** (2021), [[arXiv:2010.08907](#)] [[hep-ph](#)].
3. B. Smith and A. Rashed, “Reading the Lattice QCD Form Factors of the $\Lambda_b \rightarrow \Lambda_c$ Transition Using a C-Code,” [[arXiv:2010.00210](#)] [[hep-ph](#)].
4. S. Antusch, A. Hammad and A. Rashed, “Probing Z' mediated charged lepton flavor violation with taus at the LHeC,” **Phys. Lett. B** **810**, **135796** (2020), [[arXiv:2003.11091](#)] [[hep-ph](#)].

5. S. Kamali, A. Rashed, and A. Datta, "New physics in inclusive $B \rightarrow X_c \ell \bar{\nu}$ decay in light of $R(D^{(*)})$ measurements," **Phys. Rev. D** **97**, 095034 (2018), [arXiv:1801.08259 \[hep-ph\]](#).
6. N. B. Beaudry, A. Datta, D. London, A. Rashed and J. S. Roux, "The $B \rightarrow \pi K$ Puzzle Revisited," **JHEP** **1801**, 074 (2018), [arXiv:1709.07142 \[hep-ph\]](#).
7. A. Datta, S. Kamali, S. Meinel and A. Rashed, "Phenomenology of $\Lambda_b \rightarrow \Lambda_c \tau \bar{\nu}_\tau$ using lattice QCD calculations," **JHEP** **1708**, 131 (2017), [arXiv:1702.02243 \[hep-ph\]](#).
8. A. Rashed and A. Datta, "Determination of mass hierarchy with $\nu_\mu \rightarrow \nu_\tau$ appearance and the effect of nonstandard interactions", **Int. J. Mod. Phys. A** **32**, no. **11**, 1750060 (2017), [arXiv:1603.09031 \[hep-ph\]](#)
9. M. Abbas, S. Khalil, A. Rashed, A. Sil, "Neutrino Masses and Deviation from Tri-bimaximal mixing in $\Delta(27)$ model with Inverse Seesaw Mechanism"; **Phys. Rev. D** **93**, no. **1**, 013018 (2016), [arXiv:1508.03727 \[hep-ph\]](#).
10. Hongkai Liu, Ahmed Rashed, Alakabha Datta, "Probing lepton non-universality in tau neutrino Scattering"; **Phys.Rev. D** **92** (2015) 073016, [arXiv:1505.04594 \[hep-ph\]](#).
11. Ahmed Rashed, Preet Sharma, and Alakabha Datta, "Tau neutrino as a probe of non-standard interactions"; **Nucl. Phys. B** **877**, 662 (2013), [arXiv: 1303.4332 \[hep-ph\]](#).
12. Subhaditya Bhattacharya (UC Riverside), Ernest Ma (UC Riverside), Alexander Natale (UC Riverside), and Ahmed Rashed; "Radiative Scaling Neutrino Mass with A_4 Symmetry"; **Phys. Rev. D** **87**, 097301 (2013), [arXiv:1302.6266 \[hep-ph\]](#).
13. Ernest Ma (UC Riverside), Alexander Natale (UC Riverside), and Ahmed Rashed; "Scotogenic A_4 neutrino model for nonzero θ_{13} and large δ_{CP} "; **Int. J. Mod. Phys. A** **27** (2012) 1250134, [arXiv:1206.1570v1 \[hep-ph\]](#).
14. Ahmed Rashed, Murugeswaran Duraisamy, and Alakabha Datta; "Non-standard interactions of tau neutrinos via charged Higgs and W' contribution"; **Phys. Rev. D** **87**, 013002 (2013), [arXiv: 1204.2023 \[hep-ph\]](#).
15. Ahmed Rashed; "Deviation from tri-bimaximal mixing and large reactor mixing angle"; **Nucl. Phys. B** **874**, 679 (2013), [arXiv:1111.3072 \[hep-ph\]](#).
16. Ahmed Rashed, Alakabha Datta; "The charged lepton mass matrix and non-zero θ_{13} with TeV scale new physics"; **Phys.Rev.D** **85**, 035019 (2012), [arXiv:1109.2320 \[hep-ph\]](#).
17. Murugeswaran Duraisamy, Ahmed Rashed, Alakabha Datta; "The top forward backward asymmetry with general Z' couplings"; **Phys.Rev.D** **84**, 054018 (2011), [arXiv:1106.5982 \[hep-ph\]](#).
18. Ahmed Rashed, Murugeswaran Duraisamy, and Alakabha Datta; "Probing light pseudoscalar, axial vector states through $\eta_b \rightarrow \tau^+ \tau^-$ "; **Phys.Rev.D** **82**, 054031 (2010), [arXiv:1004.5419 \[hep-ph\]](#).

8.2 Conference proceedings

1. Ahmed Rashed, “Tau neutrino as a probe of nonstandard interactions via charged Higgs and W' contribution”. Proceedings of the DPF 2013 Meeting at UC Santa Cruz, Santa Cruz, California, USA, 14-17 August 2013. **Mod. Phys. Lett. A** **29**, no. 7, 1450040 (2014).
2. Subhaditya Bhattacharya (UC Riverside), Ernest Ma (UC Riverside), Alexander Natale (UC Riverside), and Ahmed Rashed, “Radiative Scaling Neutrino Mass with A_4 Symmetry and Warm Dark Matter”. Proceedings of the Phenomenology 2013 Symposium at Pittsburgh University, Pennsylvania, USA, 6-8 May 2013.
3. Ahmed Rashed, “Corrections to the tau neutrino mixing from charged Higgs and W' contribution to ν_τ -nucleon scattering”. Proceedings of the Phenomenology 2012 Symposium: LHC Lights the Way to New Physics (PHENO 2012) at Pittsburgh University, Pennsylvania, USA, 7-9 May 2012.
4. Ahmed Rashed and Alakabha Datta, “The Charged Lepton Mass Matrix and Non-zero θ_{13} with TeV Scale New Physics”. Proceedings of the APS April Meeting 2012 at Atlanta, Georgia, USA, 31 Mar - 3 Apr 2012. **Mod. Phys. Lett. A** **28**, 1330030 (2013).
5. Ahmed Rashed, Murugeswaran Duraisamy, and Alakabha Datta, “Study of the $\eta_b \rightarrow \tau^+\tau^-$ decay as a probe for light pseudoscalar, axial vector states”. PHENO 2011 Symposium at Madison, Wisconsin, USA, 9-11 May 2011.

8.3 Review/Technical articles

1. P. Agostini *et al.* [LHeC and FCC-he Study Group], “The Large Hadron-Electron Collider at the HL-LHC,” [[arXiv:2007.14491](#)] [[hep-ex](#)].
2. J. L. Hewett, H. Weerts, R. Brock, J. N. Butler, B. C. K. Casey, J. Collar, A. de Gouvea, R. Essig, Y. Grossman and W. Haxton, *et al.* “Fundamental Physics at the Intensity Frontier,” [[arXiv:1205.2671](#)] [[hep-ex](#)].

9 Faculty/Students Research Grants

9.1 Education Grants

1. Academic Innovation Grant, Shippensburg University, 2018, (**\$100,000**).
2. Tech Fee Award, Shippensburg University, 2020, (**\$21,500.00**).
3. Kresge Award, Shippensburg University, 2020, (**\$23,806.00**).

9.2 Major Research Grants

1. Faculty Professional Development Council (FPDC), 2021, (**\$3500**)
2. SU Faculty Professional Development Council (SU FPDC), 2019, (**\$5600**)

3. STDF-IFE Post-doctoral Grant, co-financed by Science and Technological Development Fund (STDF) - Institut Français d’Egypte (IFE) 2015-2016, France. (**\$30,000**)
4. Heiwa-Nakajima Post-doctoral Grant 2014-2015, High Energy Accelerator Research Organization (KEK), Japan. (**\$19,000**)
5. Graduate Student Council Research Grant 2011-2012, University of Mississippi. (**\$1,000**)

9.3 Small Research Grants

1. College of Arts and Sciences Faculty-Led Research Fund grant (FLRF), 2020, (**\$1,000**)
2. College Of Arts & Sciences Faculty-Led Research Fund (FLRF), 2019, (**\$1,000**)
3. Faculty Training and Continuing Education (FTCE), 2019, (**\$1300**) to get the online data scientist Master on simplilearn.com
4. College Of Arts & Sciences Faculty-Led Research Fund, 2019, (**\$1,000**)

9.4 Undergraduate Research Grants

1. Summer Undergrad Research Experience (SURE) Grant, 2020, (**\$750**)
2. Student/Faculty Research Engagement (SFRE) Grants, 2019, (**\$2300**)
3. Student/Faculty Research Engagement (SFRE) Grants, 2018, (**\$500**)
4. Brenizer Endowment Fund, 2018, (**\$550**)

9.5 External Research Grants

- Cottrell Scholar Grant, (**\$100,000**), I applied and the result is in 2022
- Charles E. Kaufman Foundation Pittsburgh Foundation research grant, 2021, (**\$150,000**) but did not get funded
- Charles E. Kaufman Foundation Pittsburgh Foundation research grant, 2019, (**\$150,000**) but did not get funded

10 Students Supervised Research

- B. Smith and A. Rashed, “Reading the Lattice QCD Form Factors of the $\Lambda_b \rightarrow \Lambda_c$ Transition Using a C-Code,” [[arXiv:2010.00210 \[hep-ph\]](https://arxiv.org/abs/2010.00210)]. Paper sent for publication in a peer-reviewed journal.
- B. Smith and A. Rashed, software license through the GUN General Public License (GPL)

- Karim Kallich and Ahmed Rashed, "Searching for neutral state in the rare decay $J/\psi \rightarrow \phi e^+ e^-$ ". Ongoing project.
- Mr. Smith received an award for our results from the University called APSCUF College/Coach Student award in 2019/2020.

11 Research Collaboration Visits

- Visiting Researcher Scholar at particle physics in the physics department at Basel University in Switzerland, summer 2019. Trip covered through the SU Faculty Professional Development Council (SU FPDC) grant.
- Visiting Researcher Scholar at Prof. Alexei Smirnov research group, ICTP, Italy, December 2015.
- Visiting Student Researcher at Prof. Andre de Gouvea research group, Northwestern University, April 2013.
- Visiting Student Researcher at Prof. Ernest Ma research group, University of California Riverside, June 2012.

12 Areas of Research Interest

Particle physics beyond the Standard Model, neutrino mixing, non-standard neutrino interactions, top physics, quarkonium physics, CP-violation, and B-Physics.

13 Membership in International Collaborations

- Large Hadron electron Collider (LHeC), BSM group
- Future Circular Collider (FCC-he)

14 Honors and Awards

- Albert Nelson Marquis Lifetime Achievement Award, 2017.
- American Physical Society DPF Travel Award, 2014.
- American Physical Society DPF Travel Award, 2013.
- Graduate Student Achievement Award, University of Mississippi, 2013.
- Dissertation Fellowship Award, University of Mississippi, 2012.
- Scientific Publications Award, Misr El-Kheir Foundation, Egypt, 2012.
- Tutorial Performance Award for Outstanding Pedagogy in Presentation, the international neutrino summer school 2012, Virginia Tech and Fermilab, 2012.
- Summer Research Assistantship, University of Mississippi, (2011 and 2012).

- American Physical Society FGSA Travel Award, 2011.
- Zdravko Stipcevic Honors Fellowship, University of Mississippi, 2010-2014.
- Ph.D. scholarship from the University of Mississippi, January 2009-2014.
- Diploma scholarship from the African Institute for Mathematical Science (AIMS), 2008.

15 Memberships In Professional And Honorary Societies

- American Association of Physics Teachers AAPT, 2018.
- Sigma Pi Sigma **Honor** Society ($\Sigma\Pi\Sigma$).
- American Physical Society (APS).
- Mississippi Academy of Sciences (MAS).
- Society of Physics Students (SPS).

16 Conferences/Workshops Attended

1. Global Analytics Summit on EXPLAINABLE AI, University of Texas at Austin, November 11-12, 2021
2. PASSHE Federal Grant Funding Workshop - May 27, 2020
3. Sixth Summer School on Machine Learning in High Energy Physics - July 16-30, 2020
4. Physics and Astronomy New Faculty Workshop, October 25-28, 2018 in College Park, Maryland
5. "Behind Neutrino Mass - Workshop on theoretical aspects of the neutrino mass and mixing", ICTP in Trieste, Italy, September 17-21, 2012.
6. "The 4th International Summer School on Neutrino Physics (INSS2012)", Virginia Tech's Center for Neutrino Physics in Blacksburg, Virginia, USA, July 10-21, 2012.
7. "Fundamental Physics at the Intensity Frontier Workshop", Rockville, MD, Nov.30-Dec.2, 2011.
8. "International Conference on Neutrino Physics in the LHC Era", Luxor, Egypt, Nov. 15-19, 2009.
9. "Introductory School on Gauge Theory/Gravity Correspondence", ICTP, Italy, May 19-30, 2008.
10. "The CTP Symposium on Supersymmetry at LHC: Theoretical and Experimental Perspectives", the British University in Egypt (BUE), Egypt, March 11-14, 2007.
11. "The Second Cairo International Conference on High Energy Physics", the German University in Cairo (GUC), Egypt, Jan. 14-17, 2006.
12. Several workshops on particle physics and cosmology, Ain Shams University and

GUC, Egypt, 2001-2006.

17 Talks/Presentations

1. “American Physical Society (APS) April Meeting”, Savannah, GA, USA, April 5 - 8, 2014.
2. “Meeting of the American Physical Society (APS) Division of Particles and Fields (DPF)”, University of California Santa Cruz, USA, August 13-17, 2013.
3. “The 2013 Phenomenology Symposium”, University of Pittsburgh, USA, May 6-8, 2013.
4. “American Physical Society (APS) April Meeting”, Denver, CO, USA, April 13 - 16, 2013.
5. “The 2012 Phenomenology Symposium”, University of Pittsburgh, USA, May 7-9, 2012.
6. “American Physical Society (APS) April Meeting”, Atlanta, GA, USA, March 31 - April 3, 2012.
7. “The Mississippi Academy of Sciences Annual Meeting”, University of Southern Mississippi, USA, February 23-24, 2012.
8. The physics department colloquium, University of Mississippi, USA, October, 2011.
9. Theoretical Advanced Study Institute in Elementary Particle Physics (TASI) School “The Dark Secrets of the Terascale”, University of Colorado, Boulder, Colorado, USA, June 6-July 1, 2011.
10. “The Coordinated Theoretical-Experimental Project on QCD (CTEQ) School”, University of Wisconsin- Madison, Wisconsin, USA, July 10-20, 2011.
11. “The 2011 Phenomenology Symposium”, University of Wisconsin-Madison, Wisconsin, USA, May 9-11, 2011.
12. “The Mississippi Academy of Sciences Annual Meeting”, University of Southern Mississippi, USA, February 17-18, 2011.
13. A poster at the XXXVIII SLAC Summer Institute (SSI) 2010, “Neutrinos Nature’s Mysterious Messengers.”, SLAC, USA, August 2-13, 2010.

18 Travel Awards

1. [Travel Grant, NSF, Physics and Astronomy New Faculty Workshop, October 25-28, 2018 in College Park, Maryland](#)
2. “Visiting Researcher Scholar”, ICTP in Trieste, Italy, Nov. 20 - Dec. 20, 2015, **(Full coverage)**.
3. “Canadian-American-Mexican Graduate Student Physics Conference (CAM2013)”, University of Waterloo, Waterloo, Ontario, Canada, August 15-18, 2013, **(USD 1130)**.

4. “The 2013 Phenomenology Symposium”, University of Pittsburgh, USA, May 6-8, 2013, **(USD 300)**.
5. “Behind Neutrino Mass - Workshop on theoretical aspects of the neutrino mass and mixing”, ICTP in Trieste, Italy, September 17-21, 2012, **(Full coverage)**.
6. “The 4th International Summer School on Neutrino Physics (INSS2012)”, Virginia Tech’s Center for Neutrino Physics in Blacksburg, Virginia, USA, July 10-21, 2012, **(USD 800)**.
7. “Fundamental Physics at the Intensity Frontier Workshop”, Rockville, MD, Nov.30-Dec.2, 2011, **(Full Coverage)**.
8. “The Coordinated Theoretical-Experimental Project on QCD (CTEQ) School”, University of Wisconsin- Madison, Wisconsin, USA, July 10-20, 2011, **(USD 300)**.
9. TASI School “The Dark Secrets of the Terascale”, University of Colorado, Boulder, Colorado, USA, June 6-July 1, 2011, **(USD 1500)**.
10. XXXVIII SLAC Summer Institute (SSI) 2010, “Neutrinos Nature’s Mysterious Messengers.”, SLAC, USA, August 2-13, 2010, **(Registration fee waiver and USD 235)**.
11. “International Conference on Neutrino Physics in the LHC Era”, Luxor, Egypt, Nov. 15-19, 2009, **(Accommodation and USD 1000)**.
12. “Introductory School on Gauge Theory/Gravity Correspondence”, ICTP, May 19-30 2008, **(Full coverage)**.

19 Community Activities

- Judge in The Pennsylvania Junior Academy of Science (PJAS) science fair which is a statewide organization for junior and senior high school students

20 Service To University and Department

20.1 University Committees

1. Appointed as an APSCUF representative to the UTC Web Content Advisory Committee
2. Sabbatical Leave Committee (2020-2021)
3. University Technology Council (subcommittees listed below) University Technology & Library Services Council (2018-2019, 2019-2020)
4. Open House (2018-2019, 2019-2020, 2020-2021)

20.2 Department Committees

1. Department Representative of APSCUF (2018-2019, 2020-2021)
2. DPAC Chair (2018-2019, 2019-2020, 2020-2021)
3. Department Representative of APSCUF (2019-2020, 2020-2021)

21 Professional Experience

1. Co-leader of Academic Innovation Grant (\$100,000) to renovate the general physics laboratory at Shippensburg University.
2. Emphasis on large-enrollment introductory laboratory and lecture courses.
3. Supervising undergraduate research.
4. Co-supervising graduate research.
5. Strong commitment to teaching at the undergraduate level.
6. Developing new experiments in the general physics lab at Delta State University.
7. College level teaching experience.
8. Teaching graduate courses.
9. Active learning approach (Flipped Classroom Technique).
10. On-line teaching experience.
11. Post-doctoral research experience.

22 Professional Experience Not Covered Above

1. At Ain Shams University, I have participated in the quality assurance and assessment committee.
2. At Ain Shams University, German University and British University, I was one of the organizers of various national and international conferences and workshops held on particle physics.
3. At Ain Shams University, I improved student enrollment.
4. I served on many committees at Ain Shams University and Zewail University. My work in some of these committees involved recruiting of students from women and underrepresented minorities.
5. I helped my supervisor at University of Mississippi with his work with the National Science Foundation grants.
6. I have also participated in many open houses at the University of Mississippi.

23 References

1. Prof. Abdulmajeed Abdurrahman, Department Chair
2. Dr. Michael Cohen, Physics Department, Shippensburg University
3. Prof. Stefan Antusch, Department of Physics, University of Basel
4. Prof. Stefano Moretti, Physics and Astronomy Department, University of Southampton