Aqeel Ahmed

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Publications: inspirehep.net/authors/1091402
Google Scholar: pVXTbXYAAAAJ

SUMMARY
A PhD physicist with expertise in analytical problem-solving, quantitative modeling, and computational methods. I have experience leading analytical model building and complex data-driven projects, programming in Python and C/C++, and collaborating with international teams. I am seeking to apply scientific rigor and technical proficiency in analytical model building and data-intensive roles.

SKILLS

- **Programming:** Python, C/C++, Wolfram Mathematica, Fortran
- **Data Science:** Scikit-learn, PyTorch
- **Tools:** Git, Linux, LaTeX, Jupyter, Docker, SQL
- **Soft Skills:** Project Management, Communication, Critical Thinking, Team Collaboration
- **Languages:** English (Fluent), German (Intermediate, B1)

EXPERIENCE

- Postdoctoral Researcher — Oct 2020 – Present
  Max-Planck-Institut für Kernphysik, Heidelberg, Germany
  - Developed new complex quantitative/mathematical models addressing fundamental puzzles in theoretical particle physics and cosmology, resulting in 8 publications.
  - Performed advanced data analysis (NumPy, SciPy, Matplotlib, Mathematica) on large datasets to derive insights.
  - Led and coordinated international project teams, mentoring 7 MSc/PhD researchers.

- Postdoctoral Researcher, — Oct 2018 – Sep 2020
  Vrije Universiteit Brussel, Brussels, Belgium
  - Analytic model building in theoretical high energy physics, research published in 5 papers.
  - Designed and implemented algorithms in C++, Python, Mathematica and Fortran.

- Postdoctoral Researcher, — Dec 2017 – Sep 2018
  Johannes Gutenberg University, Mainz, Germany
  - Utilized Mathematica and Python for symbolic analysis and numerical simulations of theoretical particle physics models.
  - Collaborated with researchers to develop and refine computational tools and methods.

- Research Associate — Apr 2016 – Nov 2017
  University of Warsaw, Warsaw, Poland
  - Led research initiatives, performing advanced analytic and numerical calculations using Mathematica, C++, Fortran and Python.
  - Developed scripts and tools for data analysis and automation of computational tasks.
  - Co-supervised 3 Masters/PhD students.

- Research Staff — Feb 2009 – Dec 2011
  National Centre for Physics, Islamabad, Pakistan
  - Conducted theoretical research and simulations using Wolfram Mathematica.

EDUCATION	◆ PhD Physics *(International PhD Fellowship)*	Dec 2011 – Jan 2016

◆ PhD Physics *(International PhD Fellowship)*   Dec 2011 – Jan 2016
University of Warsaw, Warsaw, Poland
Visiting Student: University of California, Riverside, USA (1 year)
University of California, Davis, USA (6 months)

◆ M.Sc. & M.Phil Physics *(Chancellor Gold Medal)*   Feb 2006 – Apr 2010
Quaid-i-Azam University, Islamabad, Pakistan

◆ B.Sc. Physics and Mathematics *(1st position)*   2003 – 2005
University of the Punjab, Govt. College Jhelum, Pakistan

RESEARCH

I have authored 30+ scientific publications in the field of theoretical particle physics and cosmology, particularly focusing on model building and phenomenological aspects of physics beyond the Standard Model. My primary research areas included dark matter, dynamical solutions to the hierarchy problem, warped extra dimensions, composite/holographic Higgs models, flavor physics, and early universe cosmology. I have presented my scientific papers at 50+ international conferences, workshops, schools, and seminars across Europe, Asia, and the USA. My physics research has also provided transferable skills to other fields, particularly mathematical and analytical model building, large data analysis, developing high-performance algorithms, project planning, execution, and management.

SELECTED PUBLICATIONS

Complete list of publications at iNSPIRE page https://inspirehep.net/authors/1091402

[1] A. Ahmed, M. Lindner and P. Saake, "Conformal little Higgs models," Phys. Rev. D **109** (2024) no.7, 075041 [arXiv:2309.07845].

[2] A. Ahmed, B. Grzadkowski and A. Socha, "Higgs boson induced reheating and ultraviolet frozen-in dark matter," JHEP **02** (2023) 196 [arXiv:2207.11218].

[3] A. Ahmed, B. Grzadkowski and A. Socha, *"Gravitational production of vector dark matter"*, JHEP **08** (2020) 059 [arXiv:2005.01766].

[4] A. Ahmed, *"Heavy Higgs of the Twin Higgs Models"*, JHEP **02** (2018) 048 [arXiv:1711.03107].

[5] A. Ahmed, M. Duch, B. Grzadkowski and M. Iglicki, *"Multi-Component Dark Matter: the vector and fermion case"*, Eur. Phys. J. **C78**, no.11 (2017) 905 [arXiv:1710.01853].

[6] A. Ahmed and B. M. Dillon, *"Clockwork Goldstone Bosons"*, Phys. Rev. **D96** no. 11, (2017) 115031 [arXiv:1612.04011].

[7] A. Ahmed and B. Grzadkowski, *"Brane modeling in warped extra-dimension"*, JHEP **01** (2013) 177 [arXiv:1210.6708].

TEACHING

◆ University of Heidelberg (*Standard Model of Particle Physics*)

◆ Vrije Universiteit Brussel (*Statistical Physics*)

◆ Quaid-i-Azam University (*Quantum Field Theory, Particle Physics, Group Theory*)

MANAGEMENT

◆ **Supervision:** I have co-supervised *10+ Masters/PhD students.*

◆ **Refereeing:** Journal of High Energy Physics (JHEP), Physical Review D (PRD), European Physical Journal C (EPJC), and Advances in High Energy Physics

◆ **Organizer:** During my research career, I have been instrumental in organizing over 10 international conferences and workshops.

◆ **Postdoc representative:** be-h project (www.be-h.be), Brussels   2018 – 2020
Convener: *Transversal theory approach towards new physics*