

# Aqeel Ahmed

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## 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	<ul style="list-style-type: none"> <li>◆ PhD Physics (<i>International PhD Fellowship</i>) <b>University of Warsaw</b>, Warsaw, Poland <i>Visiting Student</i>: University of California, Riverside, USA (1 year) University of California, Davis, USA (6 months)</li> <li>◆ M.Sc. &amp; M.Phil Physics (<i>Chancellor Gold Medal</i>) <b>Quaid-i-Azam University</b>, Islamabad, Pakistan</li> <li>◆ B.Sc. Physics and Mathematics (<i>1st position</i>) <b>University of the Punjab</b>, Govt. College Jhelum, Pakistan</li> </ul>	<p>Dec 2011 – Jan 2016</p> <p>Feb 2006 – Apr 2010</p> <p>2003 – 2005</p>
RESEARCH	<p>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.</p>	
SELECTED	<p>Complete list of 30+ publications at iNSPIRE page <a href="https://inspirehep.net/authors/1091402">https://inspirehep.net/authors/1091402</a></p>	
PUBLICATIONS	<p>[1] A. Ahmed, M. Lindner and P. Saake, “Conformal little Higgs models,” <i>Phys. Rev. D</i> <b>109</b> (2024) no.7, 075041 [arXiv:2309.07845].</p> <p>[2] A. Ahmed, B. Grzadkowski and A. Socha, “Higgs boson induced reheating and ultraviolet frozen-in dark matter,” <i>JHEP</i> <b>02</b> (2023) 196 [arXiv:2207.11218].</p> <p>[3] A. Ahmed, B. Grzadkowski and A. Socha, “Gravitational production of vector dark matter”, <i>JHEP</i> <b>08</b> (2020) 059 [arXiv:2005.01766].</p> <p>[4] A. Ahmed, “Heavy Higgs of the Twin Higgs Models”, <i>JHEP</i> <b>02</b> (2018) 048 [arXiv:1711.03107].</p> <p>[5] A. Ahmed, M. Duch, B. Grzadkowski and M. Iglicki, “Multi-Component Dark Matter: the vector and fermion case”, <i>Eur. Phys. J.</i> <b>C78</b>, no.11 (2017) 905 [arXiv:1710.01853].</p> <p>[6] A. Ahmed and B. M. Dillon, “Clockwork Goldstone Bosons”, <i>Phys. Rev.</i> <b>D96</b> no. 11, (2017) 115031 [arXiv:1612.04011].</p> <p>[7] A. Ahmed and B. Grzadkowski, “Brane modeling in warped extra-dimension”, <i>JHEP</i> <b>01</b> (2013) 177 [arXiv:1210.6708].</p>	
TEACHING	<ul style="list-style-type: none"> <li>◆ University of Heidelberg (<i>Standard Model of Particle Physics</i>)</li> <li>◆ Vrije Universiteit Brussel (<i>Statistical Physics</i>)</li> <li>◆ Quaid-i-Azam University (<i>Quantum Field Theory, Particle Physics, Group Theory</i>)</li> </ul>	
MANAGEMENT	<ul style="list-style-type: none"> <li>◆ <b>Supervision:</b> I have co-supervised 10+ Masters/PhD students.</li> <li>◆ <b>Refereeing:</b> Journal of High Energy Physics (JHEP), Physical Review D (PRD), European Physical Journal C (EPJC), and Advances in High Energy Physics</li> <li>◆ <b>Organizer:</b> During my research career, I have been instrumental in organizing over 10 international conferences and workshops.</li> <li>◆ <b>Postdoc representative:</b> <i>be-h project</i> (<a href="http://www.be-h.be">www.be-h.be</a>), Brussels Convener: <i>Transversal theory approach towards new physics</i></li> </ul>	<p>2018 – 2020</p>