

Zeeshan Amjad

Zhejiang Normal University, Jinhua, China

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Date of Birth: 12-September-1989

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Research Interests

Mathematical Physics

Continuous and discrete integrable systems

PT-symmetric and nonlocal systems

Non-commutative systems

Supersymmetry

Education

Oct 2015 – **Ph.D., Physics, University of the Punjab, Lahore, Pakistan**

Jan 2023 Advisors: Dr. Bushra Haider

Thesis: Algebraic Aspects and Soliton Solutions of Generalized Heisenberg Magnet Model.

Sep 2012 – **M.S., Physics, University of the Punjab, Lahore, Pakistan**

Jul 2014 Advisor: Prof. Mahmood-ul-Hassan

Thesis: Bilinearization and Backlund Transformations.

Sep 2009 – **M.Sc., Physics, University of the Punjab, Lahore, Pakistan**

Dec 2011 Focus: Particle Physics.

Sep 2007 – **B.Sc., Physics & Mathematics, Govt. Post Graduate Islamia College, Gujranwala, Pakistan**

Jul 2009 Selected activities: Class representative; Team projects.

Professional Education

Sep 2014 – **B.Ed., Allama Iqbal Open University, Islamabad, Pakistan**

Aug 2015 Topic: Studies focused on the teaching of physics and mathematics subjects

Research Experience

Title Postdoctoral Fellowship

Duration June 2024 - Present

Institution Department of Mathematics, Zhejiang Normal University, Jinhua, China

Research Darboux transformation and binary Darboux transformation of continuous and discrete integrable systems

Topic:

Teaching Experience

Title Visiting Lecturer

Duration September 2015 - August 2016

Institution Sargodha University Gujranwala Campus

Taught Mechanics, Electricity and Magnetism

Courses

Title Lecturer

Duration September 2016 - July 2018
Institution Royal College Of Management Sciences
Taught Classical Mechanics, Quantum Mechanics, Electromagnetic Theory
Courses
Title Lecturer
Duration August 2018 - February 2023
Institution Superior Group Of Colleges, Gujranwala
Taught Quantum Mechanics, Plasma Physics, Classical Electrodynamics
Courses
Title College Teacher Intern
Duration October 2014 - May 2015
Institution Govt. Post Graduate Islamia College, Gujranwala
Taught Intermediate Physics
Courses

Publications

1. **Z. Amjad*** and B. Haider, *Darboux transformations of supersymmetric Heisenberg magnet model*, J. Phys. Commun. **2** 035019 (2018).
2. **Z. Amjad*** and B. Haider, *Binary Darboux transformations of supersymmetric Heisenberg magnet model*, Theor. and Math. Phys. **199** (3): 784–797 (2019).
3. **Z. Amjad*** and B. Haider, *Quasi-Grammian solutions of generalized Heisenberg magnet model*, cand. J. Phys. **93**(3): 303-311 (2020).
4. **Z. Amjad*** and B. Haider, *Binary Darboux transformation of time-discrete lattice Heisenberg magnet model*, Chaos, Solitons & Fractals, **130** (2020).
5. **Z. Amjad*** and B. Haider, *Multisolitons of $U(N)$ generalized Heisenberg magnet model and Yang Baxter relation*, Theor. and Math. Phys, **205** 1426-1438 (2020).
6. **Z. Amjad*** and D. Khan, *Binary Darboux transformation for a negative order AKNS equation*, Theor. and Math. Phys. **206** (2): 128–141 (2021).
7. **Z. Amjad***, *Breather and soliton solutions of semi-discrete negative order AKNS equation*, Eur. Phys. J. Plus. **137**:1036 (2022).
8. **Z. Amjad*** and B. Haider, *Solitons and quasi-Grammians of generalized lattice Heisenberg magnet model*, Commun. Theor. Phys. 75 085004 (2023).
9. **Z. Amjad**, B. Haider and W. X. Ma*, *Integrable discretization and multi-soliton solutions of negative order AKNS equation*, Qual. Theo. Dyn. Syst, **23** 280 (2024).
10. N. Raza, A. Jhangeer, **Z. Amjad***, B. Rani and T. Muhammad, *Analyzing coupled-wave dynamics: lump, breather, two-wave and three-wave interactions in a $(3 + 1)$ -dimensional generalized KdV equation*, Nonlinear Dyn 112, 22323–22341 (2024).
11. A. Jhangeer, A. Zahid, **Z. Amjad***, N. Raza and T. Muhammad, *Lax pairs and Bäcklund transformations for a new $(3 + 1)$ -dimensional integrable equation utilizing symbolic computation*, Ain Shams Eng. Journal **15** 103085 (2024).

12. N. Raza, **Z. Amjad***, B. Rani, Y. Almalki and M. Bayram, *Exploring chaos, multistability, and interaction patterns in (3+1)-dimensional KdV-BBM model*, *Nonlinear Dyn* **113** 11969–11986 (2025).
13. **Z. Amjad**, W. X. Ma* and R. M. Zulqarnain, *Double breather and peak solitons of a semi discrete short pulse equation*, *Reviews Math. Phys.* **37** 2550002 (2025).
14. N. Raza, A. Jhangeer, **Z. Amjad***, B. Rani and D. Baleanu, *Exploring Soliton Dynamics and Wave Interactions in an Extended Kadomtsev-Petviashvili-Boussinesq Equation*, *Ain Shams Eng. Journal* **16** 103395 (2025).
15. **Z. Amjad***, F. Javed, D. Pamucar, M. Alosaimi and M. A. Ashebo, *Nonlocal Complex Short Pulse Equation in PT -Symmetry like Symmetry Breaking, Breather-Grammian Interactions and Soliton Solutions*, *Scientific Reports* **15** 32343 (2025).
16. A. Ashraf, **Z. Amjad***, W. X. Ma* and N. Raza, *Symmetry and Integrability of PT-Symmetric semi-discrete Short pulse equation: A study of Rogue, Breather, and Soliton Solutions*, *Qual. Theo. Dyn. Syst* **24** 200 (2025).
17. S. Owyed, A. Jhangeer, S. Fatima, N. Raza, **Z. Amjad***, M. Bayram and T. Muhammad, *Modeling the co-infection dynamics between tuberculosis and lung cancer: Insights from simulations*, *Alexandria Engineering Journal* **130** 564–581 (2025).
18. **Z. Amjad**, B. Haider W. X. Ma and F. Javed, *Breathers and quasi-Grammians of a discrete generalized coupled dispersionless system*, *Eur. Phys. J. Plus* **140**:1254 (2025).
19. A. Ejaz, **Z. Amjad***, N. Raza, P. J. Y. Wong and Y. Almalki, *Dynamical Observations and Range of Diverse Soliton Profiles for a Nonlinear Double-Chain Deoxyribonucleic Acid Model*, *Math. and Comp. Simul.* **241** 527-541 (2026).
20. **Z. Amjad**, R. Khalid*, B. Haider and F. Javed, *Exploring supersymmetric negative order AKNS equation: Darboux transformation and multi-soliton solutions*, *Mod. Phys. Lett. A.* **41** 2550216 (2026).
21. **Z. Amjad**, W. X. Ma*, B. Haider and R. M. Zulqarnain, *Quasi-Grammians and breathers of short pulse equation*, *J. Comp. App. Math.* **485** 117515 (2026).
22. **Z. Amjad**, A. Eid, A. Farooq*, F. Javed, T. Mazhar and N. Mustapha, *Symmetry-Breaking and Preserving Breather, Kink interactions of Nonlocal Complex-Coupled Dispersionless Equation*, *Int. J. Theor. Phys.* **65** 93 (2026).

Conferences/ Workshops/Seminars

1. Attended the International Conference on Relativistic Astrophysics, Lahore-Pakistan. 10-14 February, 2015

Awards

- 2016 DPCC Scholarship for PhD from University of the Punjab
 2012 Merit Scholarship for Mphil from University of the Punjab

⁰*Corresponding Author

Computer Skills

MATLAB, Mathematica, Maple, Latex

Languages

English, Urdu Fluent

Punjabi Mother-tongue

Supervised Students

1. Zil-E-Huma (Co-Supervised With Dr. Asma Rashid Butt)

Status: In Progress

PhD