

Education and Training

- 1996 – 2000 **PhD (Doctor of Philosophy) in Physics**, *University of Cambridge*, United Kingdom.
- St. John's College, Cambridge.
- Department of Applied Mathematics and Theoretical Physics (DAMTP).
- Advisor: Jonathan M. Evans.
- Thesis: Aspects of Integrable Sigma Models.
- 1995-1996 **MASt Master of Advanced Study (Part III of Mathematical Tripos)**, *University of Cambridge*, United Kingdom.
- St. John's College, Cambridge.
- Department of Applied Mathematics and Theoretical Physics (DAMTP).
- Graduated with **distinction**.
- Courses in Theoretical Physics and Applied Mathematics.
- 1991-1994 **MSc (Master of Science) in Physics**, *Government College, Lahore*, Pakistan.
- Punjab University.
- Department of Physics.
- Graduated in first class with **first position** in Punjab University and Government College Lahore.
- Thesis: CP violation in the Standard Model.
- 1989-1991 **BSc (Bachelor of Science) in Mathematics and Physics**, *Government College, Lahore*, Pakistan.
- Punjab University.
- Major in Mathematics and Physics.
- Graduated in first class.

Teaching and Research Experience

- May 15 **Associate Professor**, *Punjab University*, Department of Physics.
2008-present
- MSc, BS courses taught: Classical Mechanics, Relativity and Cosmology.
- MS, PhD courses taught: Advanced Mathematical Physics, Quantum Field Theory.
- Research supervision: MS/MPhil and PhD dissertation projects.
- Coordinator: MS/MPhil and PhD degree program of the department till 2013.
- Nov 20, **Research Fellow**, *University of Glasgow*, Department of Mathematics.
2007-Nov 18, 2008
- Conducted research in Mathematical Physics and Integrable Systems Group.
- June 25, **Assistant Professor**, *Punjab University*, Department of Physics.
2004-May 14, 2008
- MSc, BS courses taught: Classical Mechanics, Quantum Mechanics, Relativity and Cosmology, Analytical Dynamics.
- MS, PhD courses taught: Advanced Mathematical Physics, Quantum Field Theory.
- Research supervision: MS/MPhil and PhD dissertation projects.
- Coordinator: MS/MPhil and PhD degree program of the department.
- June 01, **Lecturer**, *Punjab University*, Department of Physics.
2001-June 24, 2004
- MSc, BS courses taught: Classical Mechanics, Quantum Mechanics, Relativity and Cosmology, Theoretical Particle Physics.
- MS, PhD courses taught: Advanced Mathematical Physics, Field Theory, Topics in Theoretical Physics.
- Research supervision: MS/MPhil and PhD dissertation projects.
- Coordinator: MS/MPhil and PhD degree program of the department.
- Sep 26, **Assistant Professor**, *University of Lahore*, Department of Mathematics.
2000-May 30, 2001
- MS, PhD courses taught: Real Analysis, Field Theory, Differential Geometry.

Awards, Scholarships and Honors

- 1996-1999 **Pendlebury Award**, *full scholarship for PhD studies*, St. John's College, Cambridge, UK.
- 1997-2000 **Overseas Research Student Award**, Higher Education Funding Council, UK.
- 1999-2000 **Lundgren Research Award**, University of Cambridge, UK.
- 1999-2000 **Research Award**, Cambridge Commonwealth Trust, UK.
- 1995-1996 **ODA-Noon Scholarship**, *full scholarship for study leading to Part III Maths Tripos*, Cambridge Commonwealth Trust, UK.
- 1996 **St. John's College Prize**, *awarded for distinction in Part III Maths Tripos*, St. John's College, Cambridge, UK.
- 1996 **Fellow**, Cambridge Commonwealth Society, Cambridge, UK.
- 1994 **Gold Medal**, *awarded for first position in MSc*, Punjab University, Pakistan.
- 1994 **Academic Certificate of Merit**, Punjab University, Pakistan.
- 1982 **Recipient of merit scholarship from class five to masters**, Government of Punjab, Pakistan.
- 2005-date **Research Productivity Award**, *Pakistan Council for Science and Technology*, Ministry of Science and Technology, Pakistan.
- 2005-date **Incentive Award on Research**, *Punjab University*, Lahore, Pakistan.
- 2007-2008 **Research Fellowship**, *availed at University of Glasgow*, Higher Education Commission, Pakistan.

Academic and Research Interests

- Theoretical Physics
- Integrable Systems and Soliton Theory
- Supersymmetry
- Classical/Quantum Field Theory

PhD and MS Research Supervision

- **Former PhD students**

- 2002-2007 Dr. Usman Saleem, PhD Thesis: **Symmetries and Nonlinear Systems**, Project funded by the Higher Education Commission, Pakistan
- 2002-2007 Dr. Mohsin Siddiq, PhD Thesis: **Aspects of Integrable Systems**, Project funded by the Higher Education Commission, Pakistan
- 2005-2010 Dr. Bushra Haider, PhD Thesis: **Aspects of Algebraic Methods in Integrable Field Theories**, Project funded by the Higher Education Commission, Pakistan
- 2011-2016 Ms. Nosheen Mushahid, PhD Thesis: **Symmetries, Solitons and Integrable Models**, Project funded by the Higher Education Commission, (Thesis submitted)

- **Current PhD students**

- 2014-date Ms. Arifa Mirza, **Various aspects of integrability and supersymmetry**
- 2014-date Mr. Wajahat Ahmad Riaz, **Darboux transformation and discrete integrable systems**
- 2001-date Supervised and successfully completed **20 MS/MPhil** research dissertations on various topics of conformal field theory, supersymmetry, integrable systems, Darboux transformation, soliton theory, etc

Workshops, Conferences and Saminars/Talks

- Nov, 1996 *Geometry and quantum field theory*, Cambridge, UK
Sep, 1997 *Workshop on non-perturbative aspects of quantum field theory*, Cambridge, UK
Sep, 1998 *UK school in theoretical physics*, Oxford, UK
April, 1998 *Second UK meeting on two dimensional integrable models*, Durham, UK
March, 1998 *Spring school on non-perturbative aspects of string theory*, Treiste, Italy
July, 2001 *Workshop on low dimensional quantum systems*, Treiste, Italy
Feb, 2008 *Mathematical Physics Seminar*, Glasgow, UK
April, 2008 *Noncommutative integrable systems*, Glasgow, UK
Oct, 2008 *London Mathematical Society workshop on integrable systems*, Glasgow, UK
June, 2009 *School and Workshop on integrable systems and scientific computing*, Treiste, Italy
1993 to date *Participated and delivered talks in numerous conferences at national level*, Pakistan

Physics and University Committees

- 2001-date *Member Board of Studies*, Department of Physics, Punjab University, Lahore
2001-date *Member Board of Faculty*, Faculty of Science, Punjab University, Lahore
2002-2013 *Coordinator of MS/PhD degree Program*, Department of Physics, Punjab University, Lahore
2002-date *Member Departmental Doctoral Program Committee*, Department of Physics, Punjab University, Lahore
2002 *Member BS Curriculum Committee*, Department of Physics, Punjab University.
2002 *Member MS/PhD Curriculum Committee*, Department of Physics, Punjab University.
2010 *Member Selection Board for faculty appointments*, various universities of Pakistan
2011-2013 *Member Board of Studies*, Department of Basic Sciences, National Textile University, Faisalabad
2014-date *Member Tenure Track Review Committee*, Department of Physics, University of the Punjab, Lahore
2008-date *Member PhD Thesis Exam Committee*, COMSATS Institute of Information Technology, University of Sargodha

Computer and Software Skills

- Math Packages Mathematica, Matlab
OS Windows, Mac OS X, DOS
Typography Scientific Workplace, Scientific Word, Latex

Curriculum Development

- 2002 *Developed curriculum and course outlines of MS and regular PhD degree programs since their inception in 2002.*, Department of Physics, Punjab University, Lahore
2002 *Developed curriculum and course outlines of BS (4 years) degree program since its inception in 2002.*, Department of Physics, Punjab University, Lahore

List of Journal Publications (indexed by ISI Web of Science)

- 1999 J. M. Evans, M. Hassan, N. J. MacKay and A. J. Mountain: *Local conserved charges in principal chiral models*, Nuclear Physics B561 (1999), 385-412.
- 2000 J. M. Evans, M. Hassan, N. J. MacKay and A. J. Mountain: *Conserved charges and supersymmetry in principal chiral and WZW models*, Nuclear Physics B580 (2000), 605-646
- 2005 U. Saleem and M. Hassan, *Zero-curvature formalism of supersymmetric principal chiral model*, European Physical Journal C38 (2005), 521.
- 2005 M. Siddiq and M. Hassan, *On the linearization of the super sine-Gordon equation*, Europhysics Letters 70 (2005), 149.
- 2005 U. Saleem, M. Hassan and M. Siddiq, *Conserved quantities in noncommutative principal chiral model with Wess-Zumino term*, Journal of Physics A: Mathematical and General: 38 (2005), 9241.
- 2005 U. Saleem, M. Siddiq and M. Hassan, *On noncommutative sinh-Gordon equation*, Chinese Physics Letters 22 (2005), 1076.
- 2005 M. Siddiq and M. Hassan, *From Backlund transformation to linear system of sine-Gordon theory in superspace*, Chinese Physics Letters 22 (2005), 1567.
- 2006 U. Saleem and M. Hassan, *Superfield Lax formalism of supersymmetric sigma model on symmetric spaces*, European Physical Journal C46 (2006) 797-805.
- 2006 M. Siddiq, M. Hassan, U. Saleem, *On Darboux transformation of the supersymmetric sine-Gordon equation*, Journal of Physics A: Mathematical and General: 39 (2006) 7313-7318.
- 2006 U. Saleem, M. Hassan, *Lax pair and Darboux transformation of noncommutative $U(N)$ principal chiral model*, Journal of Physics A: Mathematical and General: 39 (2006) 11683.
- 2007 U. Saleem, M. Hassan and M. Siddiq, *Non-local continuity equations and binary Darboux transformation of non-commutative (anti) self-dual Yang-Mills equations*, Journal of Physics A: Mathematical and Theoretical: 40 No 19 (2007) 5205-5217.
- 2008 M. Siddiq, U. Saleem, M. Hassan, *Darboux transformation and multisoliton solutions of a non-commutative sine-Gordon system*, Modern Physics Letters A 23 115-127 (2008).
- 2008 Bushra Haider and M. Hassan, *On algebraic structures of the supersymmetric principal chiral model*, European Physical Journal C 53, 627-633 (2008).
- 2008 Bushra Haider and M. Hassan, *The $U(N)$ chiral model and exact multisolitons*, Journal of Physics A: Mathematical and Theoretical 41, 255202 (2008).
- 2009 M. Hassan, *Darboux transformation of the generalized coupled dispersionless integrable system*, Journal of Physics A: Mathematical and Theoretical 42, 065203 (2009).
- 2009 Bushra Haider and M. Hassan, *Quasideterminant solutions of an integrable chiral model*, Journal of Physics A: Mathematical and Theoretical 42, 355211 (2009).
- 2010 U. Saleem and M. Hassan, *Quasideterminant solutions of the generalized Heisenberg magnet model*, Journal of Physics A: Mathematical and Theoretical 43 045204 (12pp) (2010).
- 2010 Bushra Haider and M Hassan, *Quasideterminant multisoliton solutions of a supersymmetric chiral field model in two dimensions*, Journal of Physics A: Mathematical and Theoretical 43 035204 (19pp) (2010).
- 2011 U. Saleem and M. Hassan, *Darboux transformation and multi-soliton solutions of principal chiral and WZW models*, Modern Physics Letters A 26 73-85 (2011).
- 2011 Bushra Haider, M. Hassan, U. Saleem *Binary Darboux transformation and quasideterminant solutions of the chiral field*, Journal of Nonlinear Mathematical Physics, 18, 2, 299 (2011)
- 2011 Bushra Haider, M. Hassan, *Binary Darboux transformation of supersymmetric chiral field model*, Journal of Nonlinear Mathematical Physics, 18, 4, 557-581 (2011)
- 2012 Bushra Haider, M. Hassan, *Quasigrammian solutions of the coupled dispersionless integrable system*, Symmetry, Integrability, Geometry: Methods and Applications (SIGMA) 8, 084, 2012

- 2012 U. Saleem, M. Hassan, *Darboux transformation and multisoliton solutions of the short pulse equation*, Journal of Physical Society of Japan, 81, 094008, 2012
- 2013 N. Mushahid, M. Hassan, U. Saleem, *Conserved quantities in the generalized Heisenberg magnet (GHM) model*, Modern Physics Letters A Vol. 28, No. 7 (2013) 1350020
- 2013 N. Mushahid, M. Hassan, *On the Zakharov-Shabat dressing method for the generalized coupled dispersionless integrable system*, Modern Physics Letters A Vol. 28, No. 20 (2013) 1350088 (20 pages)
- 2014 N. Mushahid, M. Hassan, *A noncommutative coupled dispersionless system, Darboux transformation and explicit solutions*, Modern Physics Letters A Vol. 29, No. 39 (2014) 1450206 (20 pages)
- 2015 U. Saleem, M. Hassan, *Quasideterminant solutions of nonlinear Schrodinger equations based on Hermitian symmetric spaces*, Communications in Nonlinear Science and Numerical Simulation Vol. 23, No. 1-3 (2015) 343-365
- 2017 U. Saleem, M. Hassan, *Darboux transformation and exact multisolitons of CP^N nonlinear sigma model*, Journal of Mathematical Analysis and Applications Vol. 447, No. 2 (2017) 1080-1101
- 2017 Arifa Mirza, M. Hassan, *Bilinearization and soliton solutions of $N=1$ supersymmetric coupled dispersionless integrable system*, Journal of Nonlinear Mathematical Physics Vol.24, No. 1 (2017) 107-115.
- 2017 H. W. A. Riaz and M. Hassan, *Darboux transformation of a semi-discrete coupled dispersionless integrable system*, Communications in Nonlinear Science and Numerical Simulation, Vol.48, (2017) 387-397

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