

**M. Tahir Mustafa**

Department of Mathematics, Statistics and Physics

Qatar University, Doha 2713

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**Curriculum Vitae****EDUCATION**

1996: Ph.D., Mathematics, University of Leeds, Leeds, U.K.

1992: M. Phil, Mathematics, Quaid-i-Azam University, Islamabad, Pakistan

1989: M. Sc., Mathematics, Quaid-i-Azam University, Islamabad, Pakistan

**ADMINISTRATIVE EXPERIENCE**

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|-----------------|--|
| 09/2021-present | Head of Department of Mathematics, Statistics and Physics, College of Arts and Sciences, Qatar University      |
| 09/2019-08/2021 | Academic Coordinator for Sciences and Applied Sciences Cluster, College of Arts and Sciences, Qatar University |
| 09/2015-08/2019 | Coordinator of Mathematics Program, Department of Mathematics, Statistics and Physics, Qatar University        |

**FACULTY POSITIONS HELD**

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|-----------------|---|
| 03/2016-present | Professor, Department of Mathematics, Statistics and Physics, Qatar University  |
| 09/2013-03/2016 | Associate Professor, Department of Mathematics, Statistics and Physics, Qatar University  |
| 2008-2013       | Associate Professor, Department of Mathematics & Statistics, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia  |
| 2003-2008       | Assistant Professor, Department of Mathematics & Statistics, King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia  |
| 09/2002-12/2002 | Associate Professor, Department of Mathematics, Lahore University of Management Sciences, Lahore, Pakistan                        |
| 1997-2002       | Assistant Professor, Faculty of Engineering Sciences, GIK Institute of Engineering Sciences & Technology, Topi, Pakistan          |
| 1996-1997       | Post-doctoral Research Fellow, Mathematics Section, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy. |

**MEMBERSHIP IN PROFESSIONAL SOCIETIES**

- Canadian Mathematical Society
- Canadian Applied and Industrial Mathematics Society
- American Mathematical Society

## HONORS and AWARDS

- 2019 Selected as Academic Coordinator for Sciences and Applied Sciences Cluster, College of Arts and Sciences, Qatar University
- 2017 Merit Award for Administration, College of Arts and Sciences, Qatar University
- 2016 Teaching Excellence Award, College of Arts and Sciences, Qatar University
- 2015 Selected as Coordinator of Mathematics Program, Qatar University
- 2013 Excellence in Teaching Award (university level), King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
- 2011 Excellence in Advising Award (university level), King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
- 2009 Excellence in Teaching Award (university level), King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
- 2008 Excellence in Instructional Technology Award (university level), King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia
- 1999 Regular Associate Member of The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy. (1999-2004)

## RESEARCH AREAS

Applied Mathematics, Differential Equations, Scientific Computation & Programing, Cryptography, Applications to Fluid Dynamics, Differential Geometry, Mathematical Physics.

## GOOGLE SCHOLAR PAGE

<https://scholar.google.com/citations?user=kGL9r0kAAAAJ&hl=en>

## GRANTS/FUNDING

08/2016-08/2019

NPRP 9-329-1-067 (Lead PI), **\$763,772** funded by Qatar National Research Fund (QNRF)

02/2016-02/2019

NPRP 8-764-1-160 (Co-Lead PI), **\$810,000** funded by Qatar National Research Fund (QNRF)

04/2015-03/2016

QUUG-CAS-DMSP-14/15-6 (PI), \$16,850 funded by Qatar University

04/2014-03/2015

QUUG-CAS-DMSP-13/14-6 (PI), \$7,670 funded by Qatar University

05/2011-04/2013

IN101026 (Co-PI), \$39,277 funded by King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

03/2010-02/2011

FT100016 (Co-PI), funded by King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

03/2010-02/2011

SB100013 (PI), \$8,640 funded by SABIC and King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

03/2010-02/2011

FT100005 (PI), \$8,640 funded by King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

04/2008-03/2009

IN080397 (PI), \$12,280 funded by King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

05/2007-04/2008

SB07008 (PI), \$13,200 funded by SABIC and King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

06/2004-05/2005

FT/2004-14 (PI), \$10,506 funded by King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

## REFEREED PUBLICATIONS

1. A image encryption algorithm based on chaotic Lorenz system and novel primitive polynomial S-boxes, *Multimedia Tools and Applications*, (2021), 1-22 (with T Al-Maadeed, I. Hussain, A. Anees). **[Impact Factor 2.313]**, **[Springer]**.
2. Hydrodynamics and ferrite nanoparticles in hybrid nanofluid, *International Communications in Heat and Mass Transfer*, **118** (2020), 104883 (with J. Yang, Zahra Abdelmalek and N. Muhammad) **[Impact Factor 3.971]**, **[Elsevier]**.
3. Effect of asymmetrical heat rise/fall on the film flow of magnetohydrodynamic hybrid ferrofluid, *Scientific Reports*, **10** (2020), 6677 (with I. Tlili, K. A. Kumar and N. Sandeep) **[Impact Factor 3.998]**, **[Nature Publishing]**.
4. A computational model for suspensions of motile micro-organisms in the flow of ferrofluid, *Journal of Molecular Liquids*, **298** (2020), 112033 (with S. Nadeem, A. Alblawi, N. Muhammad, I. Alarifi and A. Issakhov) **[Impact Factor 5.065]**, **[Elsevier]**
5. Hybrid Isothermal Model for the Ferrohydrodynamic Chemically Reactive Species, *Communications in Theoretical Physics*, **71** (2019), 384–392 (with N. Muhammad and S. Nadeem) **[Impact Factor 1.322]**, **[IOP Publishing]**.
6. Computational Modeling and Forensic Analysis for Terrorist Airplane Bombing: a Case Study, *Engineering Fracture Mechanics*, **211** (2019), 137-160 (Yeh et al. including M. T. Mustafa) **[Impact Factor 3.426]**, **[Elsevier]**.
7. Invariant characterization of third-order ordinary differential equations  $u''' = f(x, u, u', u'')$  with five-dimensional point symmetry group, *Communications in Nonlinear Science and Numerical Simulation*, **67** (2019), 627-636 (with Ahmad Y. Al-Dweik and F. M. Mahomed) **[Impact Factor 4.115]**, **[Elsevier]**.

8. Construction of S-Box Based on Chaotic Map and Algebraic Structures, *Symmetry*, **11** (2019), 351 (with Iqtadar Hussain, Amir Anees, Temadher A. Al-Maadeed) [**Impact Factor 2.645**], [**MDPI**].
9. Simultaneous solutions for first order and second order slips on micropolar fluid flow across a convective surface in the presence of Lorentz force and variable heat source/sink, *Scientific Reports*, **9** (2019), 14706 (with K. A. Kumar, V. Sugunamma and N. Sandeep) [**Impact Factor 3.998**], [**Nature Publishing**].
10. Impact of magnetic dipole on a thermally stratified ferrofluid past a stretchable surface, *Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering*, 233 (2019), 177-183 (with S. Nadeem and N. Muhammad) [**Impact Factor 1.606**], [**SAGE Publications**].
11. Linearization of third-order ordinary differential equations  $u''' = f(x, u, u', u'')$  via point transformations, *Mathematical Methods in the Applied Sciences*, **41** (2018), 6955-6967, (with Ahmad Y. Al-Dweik, F. M. Mahomed and Rajai S. Alassar) [**Impact Factor 1.626**], [**Wiley**].
12. Quantization of the Szekeres system, *Classical and Quantum Gravity*, **35** (2018), 125005 (with A. Paliathanasis, Adamantia Zampeli, T. Christodoulakis) [**Impact Factor 3.071**], [**IOP Publishing**].
13. Embedding algorithms and applications to differential equations, *Journal of Symbolic Computation*, **86** (2018), 166-188 (with Sajid Ali, Hassan Azad, Indranil Biswas, Ryad Ghanam) [**Impact Factor 0.673**], [**Elsevier**].
14. Classification of the Lie and Noether point symmetries for the Wave and the Klein-Gordon equations in pp-wave spacetimes, *Communications in Nonlinear Science and Numerical Simulation*, **55** (2018), 68-83 (with A. Paliathanasis and M. Tsamparlis) [**Impact Factor 4.115**], [**Elsevier**].
15. Invariant characterization of scalar third-order ODEs that admit the maximal point symmetry Lie algebra, *Mathematical Methods in the Applied Sciences*, **41** (2018), 4714-4723 (with Ahmad Y. Al-Dweik and F. M. Mahomed) [**Impact Factor 1.626**], [**Wiley**].
16. Invariant Solutions of the Wave Equation on Static Spherically Symmetric Spacetimes Admitting G7 Isometry Algebra, *Symmetry*, **10** (2018), 665 (with H. Azad, Khaleel Anaya, A. Y. Al-Dweik) [**Impact Factor 2.645**], [**MDPI**].
17. Analysis of ferrite nanoparticles in the flow of ferromagnetic nanofluid, *PLOS one*, **13** (2018), 0188460 (with S. Nadeem and N. Muhammad) [**Impact Factor 2.740**], [**PLOS**].
18. Higher order self-adjoint operators with polynomial coefficients, *Electronic Journal of Differential Equations*, **2017** (2017), 1-21 (with H. Azad and A. Laradji) [**Impact Factor 0.820**], [**Texas State University**].
19. MHD effects on nanofluid with energy and hydrothermal behavior between two collateral plates: application of new semi analytical technique, *Thermal Science*, **21** (2017), 2081-2093 (with M. Sheikholeslami and N. S. Akbar) [**Impact Factor 1.574**], [**Vinča Institute of Nuclear Sciences**].
20. Mathematical analysis of ferromagnetic fluid embedded in a porous medium, *Results in Physics*, **7** (2017), 2361-2368 (with S. Nadeem and N. Muhammad) [**Impact Factor 4.019**], [**Elsevier**].
21. Theoretical analysis of upper-convected Maxwell fluid flow with Cattaneo–Christov heat flux model, *Chinese Journal of Physics*, **55** (2017), 1615-1625 (with S. Saleem, M. Awais, S. Nadeem and N. Sandeep) [**Impact Factor 2.638**], [**Elsevier**].
22. Chemically reactive species in the flow of a Maxwell fluid, *Results in Physics*, **7** (2017), 2607-2613 (with S. Nadeem, S. Ahmad and N. Muhammad) [**Impact Factor 4.019**], [**Elsevier**].
23. A point symmetry based method for transforming ODEs with three-dimensional symmetry algebras

- to their canonical forms, *Applied Mathematics and Computation*, **289** (2016), 444-463 (with H. Azad, Ahmad Y. Al-Dweik and F. M. Mahomed) [**Impact Factor 3.472**], [**Elsevier**].
24. Effect of Lorentz forces on forced-convection nanofluid flow over a stretched surface, *Particuology*, **26** (2016), 108-113 (with M. Sheikholeslami and D. D. Ganji) [**Impact Factor 2.787**], [**Elsevier**].
  25. Invariants of third-order ordinary differential equations  $y''' = f(x, y, y', y'')$  via point transformations, *Mathematical Methods in the Applied Sciences*, **39** (2016), 1043–1059 (with Ahmad Y. Al-Dweik, H. Azad and F. M. Mahomed) [**Impact Factor 1.626**], [**Wiley**].
  26. New parametric solutions of some Abel equations, *Miskolc Mathematical Notes*, **17** (2016), 957-964 [**Impact Factor 0.677**], [**Univ. Miskolc Inst. Math.**].
  27. Matrix Representation for Seven-Dimensional Nilpotent Lie Algebras, *Journal of Physical Mathematics*, **9** (2016).
  28. On computing joint invariants of vector fields, *Journal of Geometry and Physics*, **97** (2015), 69-76 (with H. Azad, I. Biswas and R. A. Ghanam) [**Impact Factor 1.056**], [**Elsevier**].
  29. An alternative proof of Lie's linearization theorem using a new  $\lambda$ -symmetry criterion, *Communications in Nonlinear Science and Numerical Simulation*, **26** (2015), 45-51 (with Ahmad Y. Al-Dweik, Raed A. Mara'beh and F. M. Mahomed) [**Impact Factor 4.115**], [**Elsevier**].
  30. Symmetry analysis of the Klein-Gordon equation in Bianchi I spacetimes, *International Journal of Geometric Methods in Modern Physics*, **12** (2015), 1550033 (with A. Paliathanasis and M. Tsamparlis) [**Impact Factor 1.287**], [**World Scientific**].
  31. Ferromagnetic effects for nanofluid venture through composite permeable stenosed arteries with different nanosize particles, *AIP Advances*, **5** (2015), 077102 (with N. S. Akbar) [**Impact Factor 1.337**], [**American Institute of Physics**].
  32. Nanofluid flow and heat transfer over a stretching porous cylinder considering thermal radiation, *Iranian Journal of Science and Technology Transaction A-Science*, **39** (2015), 433-440 (with M. Sheikholeslami and D. D. Ganji) [**Impact Factor 0.875**], [**Springer**].
  33. Noether symmetries and conservation laws of wave equation on static spherically symmetric spacetimes with higher symmetries, *Communications in Nonlinear Science and Numerical Simulation*, **23** (2015), 141-152 (with Ahmad Y. Al-Dweik) [**Impact Factor 4.115**], [**Elsevier**].
  34. Nanofluid in tilted cavity with partially heated walls, *Journal of Molecular Liquids*, **199** (2014), 545-551 (with M. Hosseini, M. Jafaryar and E. Mohammadian) [**Impact Factor 5.065**], [**Elsevier**].
  35. A Method for Generating Approximate Similarity Solutions of Nonlinear Partial Differential Equations, *Abstract and Applied Analysis*, Article ID 105414, (2014) (with M. Iqbal and A. A. Siddiqui) [**Hindawi**].
  36. On the linearization of second order ordinary differential equations to the Laguerre form via generalized Sundman transformations, *Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)*, **9** (2013) (with A. Y. Al-Dweik and R. A. Marabeh) [**Impact Factor 0.733**], [**National Academy of Sciences of Ukraine**].
  37. Symmetry analysis of wave equation on static spherically symmetric spacetimes with higher symmetries, *Journal of Mathematical Physics*, **54** (2013), 063509 (with H. Azad, A. Y. Al-Dweik and R. A. Ghanam) [**Impact Factor 1.317**], [**American Institute of Physics**].
  38. Thermal analysis of orthotropic pin fins with contact resistance: A closed-form analytical solution, *Heat Transfer Engineering*, **34** (2013), 349-360 [**Impact Factor 1.693**], [**Taylor & Francis**].

39. Polynomial solutions of certain differential equations arising in physics, *Mathematical Methods in the Applied Sciences*, **36** (2013), 1615–1624 (with H. Azad and A. Laradji) [**Impact Factor 1.626**], [Wiley].
40. Letter to the Editor, *Applied Thermal Engineering*, **37** (2012), 438–439 (with S. M. Zubair, and A. F. M. Arif) [**Impact Factor 4.725**], [Elsevier].
41. Harmonic morphisms projecting harmonic functions to harmonic functions, *Abstract and Applied Analysis*, (2012), Article Number: 315757 [Hindawi]..
42. The effect of coating and interface resistance on thermal performance of variable thickness annular composite fins, *Energy Conversion and Management*, **54** (2012), 152–161 (with S. Pashah, A. F. M. Arif, S. M. Zubair) [**Impact Factor 8.208**], [Elsevier].
43. Thermal analysis of orthotropic annular fins with contact resistance: A closed-form analytical solution, *Applied Thermal Engineering*, **31** (2011), 937–945 (with S. M. Zubair and A. F. Arif) [**Impact Factor 4.725**], [Elsevier].
44. Polynomial solutions of differential equations, *Advances in Difference Equations*, (2011), Article Number: 58 (with H. Azad and A. Laradji) [**Impact Factor 2.421**], [Springer].
45. Group classification, optimal system and optimal reductions of a class of Klein Gordon equations, *Communications in Nonlinear Science and Numerical Simulation*, **15** (2010), 1132–1147 (with H. Azad and M. Ziad) [**Impact Factor 4.115**], [Elsevier].
46. Analytic solutions of initial-boundary-value problems of transient conduction using symmetries, *Applied. Mathematics and Computation*, **215** (2010), 4132–4140 (with H. Azad, and A. F. M. Arif) [**Impact Factor 3.472**], [Elsevier].
47. Symmetry solutions of a non-linear elastic wave equation with third order anharmonic corrections, *Applied Mathematics and Mechanics*, **30** (2009), 1017–1026 (with K. Masood) [**Impact Factor 2.017**], [Springer].
48. A smoothing spline-based regularization of initial inverse problem in two dimensional heat equation, *Proceedings of the Institution of Mechanical Engineers, Part C-Journal of Mechanical Engineering Science*, **223** (2009), 439–449 (with K. Masood) [**Impact Factor 1.386**], [SAGE Publications].
49. An exact solution of a quasilinear Fisher equation in cylindrical coordinates, *Nonlinear Analysis-Theory Methods & Applications*, **69** (2008), 4803–4805 (with A. H. Bokhari, and F. D. Zaman) [**Impact Factor 1.587**], [Elsevier].
50. Stabilizing of an ill-posed inverse problem by using smoothing splines and hyperbolic heat equation, *Inverse Problems in Science & Engineering*, **16** (2008), 233–247 (with K. Masood) [**Impact Factor 1.314**], [Taylor & Francis].
51. Symmetry analysis of wave equation on sphere, *Journal of Mathematical Analysis and Applications*, **333** (2007), 1180–1188 (with H. Azad) [**Impact Factor 1.220**], [Elsevier].
52. Harmonic morphisms of warped product type from Einstein manifolds, *Archiv der Mathematik*, **88** (2007), 368–377 (with H. Azad) [**Impact Factor 0.518**], [Springer].
53. Wavelet optimized finite difference method with non-static regridding, *Applied. Mathematics and Computation*, **186** (2007), 203–211 (with Azad A. Siddiqui) [**Impact Factor 3.472**], [Elsevier].
54. A non-existence result for compact Einstein warped products, *Journal of Physics A: Mathematical and General*, **38** (2005), L791–L793 [**Impact Factor 1.577** in 2006], [IOP Publishing].
55. The structure of harmonic morphisms with totally geodesic fibres, *Communications in Contemporary Mathematics*, **6** (2004), 419–430 [**Impact Factor 1.278**], [World Scientific].

56. Applications of harmonic morphisms to gravity, *Journal of Mathematical Physics*, **41** (2000), 6918-6929 [**Impact Factor 1.317**], [**American Institute of Physics**].
57. Applications of Bochner technique to harmonic morphisms between simply connected space forms, Harmonic morphisms, harmonic maps and related topics, *CRC Research Notes in Mathematics* **413** (2000) (Chapman & Hall/CRC, Boca Raton, FL, 2000), 39-45.
58. Totally geodesic horizontally conformal maps, *Rendiconti dell'Istituto di Matematica dell'Università di Trieste*, **30** (1999), 45-55 [**Istituto di matematica, Università di Trieste**].
59. Restrictions on harmonic morphisms, *Conformal Geometry & Dynamics: An Electronic Journal of the American Mathematical Society*, **3** (1999), 102-115 [**American Mathematical Society**].
60. Harmonic morphisms from three-dimensional Euclidean and spherical space forms, *Algebras, Groups, Geometry*, **15** (1998), 155-172 (with J. C. Wood).
61. A Bochner technique for harmonic morphisms, *Journal of the London Mathematical Society*, **57** (1998), 746-756 [**Impact Factor 1.317**], [**Oxford university press**].

## **GRADUATE ADVISING AND RESEARCH SUPERVISION**

### **Post-doc Mentoring**

- 2018-19, Georgios Fotopoulos under NPRP grant (Ph.D. 2015)

### **Theses Supervision as Advisor**

- Raed Ali Mara'Beh, M.S., completed 2014; co-advised with Dr. Ahmad Y. Al-Dweik
- M. Aminu Nass, M.S., completed 2013; co-advised with Dr. H. Azad
- Waled Ahmed Al-Khulaifi, M.S., completed 2013; co-advised with Dr. A. Laradji
- Basim F. Mustafa, M.S., completed 2013; co-advised with Dr. Ryad Ghanam
- Khalid Ali Al-Anezy, M.S., completed 2012
- Usama Sadeq Al-Ali, M.S., completed 2012
- Kassimu Mpungu, M.S., completed 2012
- Abdul Sattar Al-Kubaish, M.S., completed 2011

### **Doctoral Dissertations & M.S. Theses Committee Member**

- Mohammed A Abushoshah, M.S., completed 2013
- Abdul-Khaleg Ali Al-Baiyat, Ph.D., completed 2012
- Mohammed D. Kassim, M.S., completed 2011
- Mohammed Abdullah Salman, M.S., completed 2011
- Bader Ahmed Alhumaidi, Ph.D., completed 2011
- Basim Jamil Muhammad Al-Minshawy, M.S., completed 2010

## **UNDERGRADUATE MENTORING/SUPERVISION**

- Defect detection of scanned images through wavelets, Final year project, Faculty of Engineering Sciences, GIK Institute of Engineering Sciences and Technology, Pakistan (2001–02)

- Network optimization and management, Final year project, Faculty of Engineering Sciences, GIK Institute of Engineering Sciences and Technology, Pakistan (2001–02)
- A Weitzenbock formula for Riemannian foliations, Mathematics Diploma Dissertation, ICTP, Trieste, Italy (1996)

## **PRESENTATIONS (Conference Presentations and Invited Talks)**

- 2019 Fall Central Sectional Meeting of the AMS, University of Wisconsin-Madison in Madison, Wisconsin (September 2019)
- Fall 2017 Central Sectional Meeting of the AMS, University of North Texas in Denton, Texas (September 2017)
- 2015 Fall Central Sectional Meeting of the AMS, Loyola University Chicago, Chicago (October 2015)
- Department of Mathematics, Statistics and Physics, Qatar University (May 2015, invited colloquium speaker)
- Spring 2015 Eastern Sectional Meeting of the American Mathematical Society, Georgetown University in Washington DC (March 2015)
- Non-Linear Science Group Seminar Series at Texas A&M University at Qatar (March 2014, invited seminar speaker)
- International Conference on Symmetries, Differential Equations and Applications, Islamabad, Pakistan (January 2014, invited talk)
- Department of Mathematics, Statistics and Physics, Qatar University (Fall 2013, invited colloquium speaker)
- International Conference on Mathematical Sciences and Statistics 2013 (ICMSS2013), Kuala Lumpur, Malaysia (February 2013)
- Conference MOGRAN 15, Antalya, Turkey (October 2012)
- Workshop on Enhancing learning and teaching through using Web2 technology, KFUPM, Dhahran (May 2010, invited speaker)
- Mathematics Education Seminar Series, KFUPM, Dhahran, Saudi Arabia (December 2008, invited seminar speaker)
- Mechanical Engineering Seminar Series, KFUPM, Dhahran, Saudi Arabia (November 2006, invited seminar speaker)
- Summer Conference in Mathematics, LUMS, Lahore, Pakistan (July 2006)
- Department of Mathematics & Statistics, KFUPM, Dhahran, Saudi Arabia (October 2005, invited colloquium speaker)
- Workshop on Industrial Mathematics, KFUPM, Dhahran, Saudi Arabia (March 2004, invited speaker)
- Department of Mathematics & Statistics, KFUPM, Dhahran, Saudi Arabia (November 2003, invited colloquium speaker)
- Mathematics Seminar Series, KFUPM, Dhahran, Saudi Arabia (April 2003, invited seminar speaker)



- DAAD Workshop on “Dialogue of Cultures: Impact of Culture on Science”, Kaiserslautern, Germany (November 2002, invited main speaker)
- LUMS Mathematics Colloquia, LUMS, Lahore, Pakistan (February 2002, invited colloquium speaker)
- LUMS Mathematics Colloquia, LUMS, Lahore, Pakistan (November 2001, invited colloquium speaker)
- Mathematics Department, Quaid-i-Azam University, Islamabad, Pakistan (December 1999, invited seminar speaker)
- Mathematics Department, Quaid-i-Azam University, Islamabad, Pakistan (February 1998, invited seminar speaker)
- Mathematics Department, Quaid-i-Azam University, Islamabad, Pakistan (December 1997, invited seminar speaker)
- Conference “Harmonic morphisms, harmonic maps and related topics”, Brest, France (July 1997, invited talk)
- Mathematics Section, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (October 1996, invited colloquium speaker)

#### **CONFERENCES (only as attendee for Professional Development)**

- CMS 75th +1 Anniversary Summer Meeting, Ottawa, Canada (June 2021)
- 5<sup>th</sup> Annual Information Security Conference for the Financial Sector – ISFS 2018, Doha, Qatar (November 2018)
- School on algebraic groups, AS–ICTP, Trieste, Italy. (1999)
- Non–linear functional analysis and differential equations, AS–ICTP, Trieste, Italy. (1996)
- School on several complex variables, ICMS, Edinburgh, U.K. (1995)

## TEACHING INTERESTS

Business Mathematics, Calculus I, Calculus II, Calculus III, Differential Equations, Linear Algebra, Matrix Algebra, Discrete Mathematics, Vector Calculus, Partial Differential Equations, Scientific Computation and Programming, Numerical Methods, Modern Geometries, Differential Geometry, Introduction to Wavelets, Introductory Statistics, Advanced Engineering Mathematics, Dynamical Systems, Lie Symmetry Method for ODEs and PDEs, Symmetries and Conservation Laws.

## COURSES TAUGHT

<b>Courses taught at Qatar University</b>	
Semester	Course Number and Title
Spring 2021	Math365.L51 Scientific Computation and Programming
Fall 2020	Math365.L51 Scientific Computation and Programming Math231-L01 Linear Algebra
Spring 2020	Math365.L51 Scientific Computation and Programming Math 101-L02 Calculus I Math 101-L51 Calculus I
Fall 2019	Math231-L01 Linear Algebra
Spring 2019	Math365.L51 Scientific Computation and Programming
Fall 2018	Math101.L03 Calculus I Math101.L51 Calculus I
Spring 2018	Math365.L51 Scientific Computation and Programming Math102.L51 Calculus II
Fall 2017	Math 385-L51 Advanced Mathematics Math231-L52 Linear Algebra
Spring 2017	Math 102-L54 Calculus II Math 102-L03 Calculus II
Fall 2016	Math 231-L01 Linear Algebra Math 385-L01 Advanced Mathematics
Spring 2016	Math 102-L02 Calculus II
Fall 2015	Math 101-L02 Calculus I Math 102-L03 Calculus II
Spring 2015	Math 101-L02 Calculus I Math 101-L55 Calculus I
Fall 2014	Math 385-L51 Advanced Mathematics Math 101-L02 Calculus I Math 101-L56 Calculus I
Spring 2014	Math 101-L02 Calculus I Math 101-L55 Calculus I
Fall 2013	Math 217-L51 Mathematics-Engineering Math 101-L03 Calculus I Math 101-L71 Calculus I

<b>Courses taught at KFUPM, Dhahran, Saudi Arabia</b>	
Academic Year	Course Number and Title
2011-12	Math440.01 Differential Geometry Math302.03 Engineering Mathematics Math599.01 Seminar Math101.33 Calculus I Math102.03 Calculus II
2010-11	Math302.03 Engineering Mathematics

	Math595.03 Reading & Research Math599.01 Seminar
2009-10	Math527.01 Differential Geometry Math102.33 Calculus II Math599.01 Seminar Math101.09 Calculus I Math101.13 Calculus I Math101.20 Calculus I Math599.01 Seminar
2008-09	Math595.03 Reading & Research Math 202-08 Elements of Differential Equations Math 202-10 Elements of Differential Equations Math 202-13 Elements of Differential Equations Math101.23 Calculus I Math101.25 Calculus I
2007-08	Math101.13 Calculus I Math527.01 Differential Geometry Math102.07 Calculus II Math102.09 Calculus II
2006-07	Math 132-04 Applied Calculus Math 202-08 Elements of Differential Equations Math 102-06 Calculus II Math 102-10 Calculus II Math 102-12 Calculus II
2005-06	Math 102-12 Calculus II Math 102-16 Calculus II Math 201-14 Calculus III Math 102-11 Calculus II
2004-05	Math 260-06 Introduction to Differential Eqs. & Linear Algebra Math 260-07 Introduction to Differential Eqs. & Linear Algebra Math 260-04 Introduction to Differential Eqs. & Linear Algebra Math 260-05 Introduction to Differential Eqs. & Linear Algebra
2003-04	Math 102-17 Calculus II Math 102-20 Calculus II Math 101-03 Calculus I Math 101-04 Calculus I Math 101-26 Calculus I
2002-03	Math 101-02 Calculus I Math 101-09 Calculus I

Courses taught at Other Institutions		
Semester	Course Title	Institution
Fall 2002	Introduction to Wavelets Calculus I	LUMS, Pakistan
Spring 2002	Dynamical Systems Numerical Analysis	GIKI, Pakistan
Fall 2001	Numerical Analysis Discrete Mathematics	GIKI, Pakistan
Spring 2000	Engineering Statistics (Two Sections)	GIKI, Pakistan
Fall 1999	Calculus I (Two Sections)	GIKI, Pakistan
Spring 1999	Engineering Statistics (Two Sections)	GIKI, Pakistan
Fall 1998	Discrete Mathematics Calculus I	GIKI, Pakistan

Spring 1998	Calculus II (Two Sections)	GIKI, Pakistan
Fall 1997	Calculus I (Two Sections)	GIKI, Pakistan

## TECHNOLOGY EXPERTISE

- Extensive experience of integration of technology in enhancing teaching, via utilization of
  - Computer algebra systems and scientific computing software: Python, Maple, Mathematica, MATLAB
  - Learning Management System “Blackboard”
  - Online homework systems
  - Other instructional technology supporting software like Camtasia
- Familiar with Learning Management System “Moodle”
- Online teaching experience using remote learning tools like Webex, Zoom and Microsoft Teams
- Fully experienced in utilizing Maple and Mathematica at advanced mathematical research level

## COURSE COORDINATION AND ACADEMIC ADVISING

2003-19    Coordinator (many times) for Math courses at KFUPM and Qatar University  
 2008-13    Graduate Academic Advisor to Mathematics MS students at KFUPM  
 2006-08    Undergraduate Academic Advisor to all Math BS students at KFUPM

## TEACHING RELATED PUBLICATIONS

- Why do certain limacons have a dimple, *Teaching Mathematics and its Applications, Oxford University Press*, **25** (2006), 196-204 (with H. Azad).
- On some applications of complex numbers to polar equations and cycloidal curves", arXiv:1211.0178 [math.HO] (with H. Azad and A. Laradji)

## **SERVICE**

### **A. Department**

#### Department of Mathematics, Statistics and Physics, Qatar University

- Coordinator of the Mathematics Program, (2015-2019)
- Coordinator for PLO Assessment of BSc Mathematics Program (2018-2019)
- Member of Department Council (2016-17, 2017-18, 2018-19)
- Member of Recruitment Committee (2016-17, 2017-18, 2018-19)
- Member of Schedules and Teaching Load (2016-17, 2017-18, 2018-19)
- Focal Point for Registration Overrides (2016-17, 2017-18, 2018-19)
- Member of Teaching Peer Review Committee (2016-17, 2017-18)
- Co-Chair of Organizing Committee of QU Math Championship (Spring 2016, Spring 2017)
- Chair of Math Program Activation Committee (2015-16)
- Member of Curriculum and Study Plans Committee (2013-14, 2014-15)
- Member of Scientific Research Committee (2013-14, 2014-15)
- Member of Placement Exam Committee (2015)

#### Department of Mathematics and Statistics, KFUPM, Dhahran, Saudi Arabia

- Member of Graduate Committee (2008-09, 2009-10, 2010-11, 2011-12, 2012-13)
- Member of Advisory Committee to Chairman (2010-11, 2011-12, 2012-13)
- Member of Excellence in Teaching & Advising Award Committee (2011-12)
- Chair of Committee for Math Minor Program (2011-12)
- Member of Undergraduate Committee (2007-08, 2008-09, 2009-10, 2010-11)
- Member of Use of Technology Committee (2009-10)
- Chair of Recitation Committee (2009-10)
- Chair of Teaching Committee (2005-06, 2006-07)
- Member of Actuarial Science Program Establishment Committee (2006-07)
- Member of Planning Committee (2003-04, 2004-05, 2005-06)
- Member of Teaching Committee (2003-04, 2004-05)
- Chair of IT in Teaching Committee (2004-05)
- Member of Mathematics Awareness Committee (2002-03, 2003-04)

### **B. University/College**

#### Qatar University

- Academic Coordinator for the Sciences and Applied Sciences Cluster (2019-present)
- Member of Sciences and Applied Sciences Cluster Council (2019-20, 2020-21)
- Chair of Curriculum and Quality Assurance and Graduate Studies Committee, Cluster level (2019-20, 2020-21)
- Chair of Schedules and Teaching Load Committee, Cluster level (2020-21)
- Member of Committee for Sciences and Applied Sciences Cluster development project (2020-21)
- Member of Budget and Strategic Plan Committee, Cluster level (2019-20, 2020-21)
- Member of Retention Committee for Science and Applied Sciences Cluster (2019-20, 2020-21)
- Member of Operational and Strategic Committee, College level (2019-20, 2020-21)
- Member of Academic Ranking Committee, College level (2020-21)
- Member of CAS online course policy committee, College level (2015)
- Member of “Teaching & Learning Strategy Advancement Group”, University level (2020-21)
- Member of University Graduate Studies Committee, University level (2019-20, 2020-21)

- Member of committee for “Alignment with QU Qualifications and competencies framework”, University level (2020-21)
- Member of committee for “Implementation of QU education excellence themes”, University level (2020-21)
- Member of committee for “STEM initiatives”, University level (2020-21)

#### KFUPM, Dhahran, Saudi Arabia

- Member of Academic Textbook Committee (2011-12)
- Member of Committee for Second Saudi Student Conference (2010-11)
- Member of Committee for Selection of Instructional Technology Award (2008-09)
- Member of Task Force for Strengthening Basic Science Programs (2006-07)

#### GIK Institute of Engineering Sciences & Technology, Topi, Pakistan

- Member of Graduate Committee
- Member of Undergraduate Curriculum Committee
- Member of Undergraduate Admission Committee
- Member of Industrial Open House Committee

### **C. Professional**

- Referee for professional journals including International Journal of Applied and Computational Mathematics, Advances in Mathematical Physics, Thermal Science, Neural Computing and Applications, Journal of Computational Design and Engineering.
- Reviewer for Mathematical Reviews
- Member of Editorial board of Advances in Pure Mathematics
- Joint Editor of The Atlas of Harmonic Morphisms available online  
<http://www.matematik.lu.se/matematiklu/personal/sigma/harmonic/atlas.html>

### **D. Program and curriculum development responsibilities**

- (2017-18) Member of team for obtaining official accreditation of seven Qatar University courses as part of the VEE (Validation by Educational Experience) requirement, students must pursue to become fully pledged actuaries. Qatar university is now added to the list of universities recognized by the Society of Actuaries, USA at  
[https://store.soa.org/Default.aspx?TabID=1808&VEE=displayonly&\\_ga=2.27648442.760282101.1528813798-587909805.1508565840](https://store.soa.org/Default.aspx?TabID=1808&VEE=displayonly&_ga=2.27648442.760282101.1528813798-587909805.1508565840)
- (2015-2019) As Coordinator of Mathematics Program, my role included leading the process of
  - curriculum development, reviewing, updating and continuous improvement in program effectiveness
  - improving curriculum delivery and teaching quality
  - assessment of program learning outcomes
- (2015- 16) As Chairman of “Math Activation Program Committee”, I led the activation of B.Sc. in Mathematics at Qatar University. A notable contribution was introduction of “Actuarial Math Specialization” for the first time in the country. The program took its first batch of students in Fall 2017.
- (2013-2019) Significant contribution in

- reviewing of the course learning outcomes and contents of many courses
  - integration of online homework systems of Calculus courses, carefully mapped to the course learning outcomes
- (2011-12) As Chairman of the Math Minor Committee, I led the development and the introduction of the Minor in Mathematics Program at KFUPM. This was first minor offered at KFUPM.
  - (2010-11) As Chairman of the Double Major Committee at KFUPM, I played a leading role in setting up the “Math Double Major” curriculum requirements for Computer Science, Computer Engineering, Electrical Engineering and Mechanical Engineering students.
  - (2006) As a member of “Actuarial Sciences Program Development Committee”, I contributed in the development of the proposal for the Actuarial Sciences Program proposed by the Department. The program was approved and introduced later.
  - (2003-13) Significantly contributed in several relevant committees (at KFUPM) like selection of textbooks, review of course contents, setting of course learning outcomes, development of program brochures etc.