

Dr. Zeeshan Yousaf

HEC Approved PhD Supervisor

Curriculum Vitae

Personal Information

Address Department of Mathematics, University of the Punjab, Quaid-i-Azam Campus, Lahore-54590, Pakistan.
Phone +92-42-99231241 Ext: 126.
Email zeeshan.math@pu.edu.pk.
Nationality Pakistani.

Education

- 2012–2015 **Ph.D. (Doctor of Philosophy)** in Modified Gravitational Theory, University of the Punjab, Pakistan.
- Department of Mathematics.
- Thesis: Dynamical Evolution of Collapsing Stellar Systems in $f(R)$ Gravity.
- 2010–2012 **M.Phil. (Master of Philosophy)** in Applied Mathematics, University of the Punjab, Pakistan.
- Department of Mathematics.
- CGPA=3.87/4.00.
- Thesis: Shear and Expansion Free Evolution Models in General Relativity.
- 2007–2009 **M.Sc. (Master of Science)** in Mathematics, University of the Punjab, Pakistan.
- Department of Mathematics.
- CGPA=3.86/4.00.

Awards, Scholarships and Honors

- 2015 **Research Productivity Award in Category A**, Pakistan Council for Science and Technology, Islamabad–Pakistan.
- 2014 **Research Incentive Award with first position**, University of the Punjab, Lahore–Pakistan.
- 2014 **Research Productivity Award in Category B**, Pakistan Council for Science and Technology, Islamabad–Pakistan.
- 2012-2014 **Indigenous Ph.D. Fellowship**, Higher Education Commission, Pakistan.
- 2011-2012 **DPC M.Phil. Merit Scholarship**, Department of Mathematics, University of the Punjab, Pakistan.

Practical Exposure

1. **Lecturer**, Department of Mathematics, University of the Punjab, Lahore. May, 2014 – Nov., 2015.
2. **Assistant Professor**, Department of Mathematics, University of the Punjab, Lahore. Nov., 2015 – present.
3. **Assistant Superintendent**, Maulana Muhammad Ali Johar Hall, University of the Punjab, Lahore. May, 2014 – Nov., 2016.
4. **Coordinator**, Computer Center, Department of Mathematics, University of the Punjab, Lahore. Sept., 2015 – May, 2016.
5. **Assistant Superintendent**, Allama Iqbal Hall, University of the Punjab, Lahore. Nov., 2016 – present.

Administrative Experiences

1. **Member** of Departmental Admission Committee, Department of Mathematics, University of the Punjab, 2014 and 2015.
2. **Incharge**, General Accounts taking of Department of Mathematics, University of the Punjab, 2014 and 2016.
3. **Associate Secretary** of International Conference on Relativistic Astrophysics, 2015.
4. **Incharge**, Accounts and Stock taking of Departmental Computer Center, Department of Mathematics, University of the Punjab, 2015.

Trainings

1. **Faculty Orientation Program** by Institute of Administration Sciences, University of the Punjab, Lahore; August 19–22, 2014.
2. **Business Edge Course Titled Communicating Effectively** by International Finance Cooperation, World Bank Group, Lahore; August 20–21, 2014.

Research Projects

1. Obtained a research project from University of the Punjab entitled “***Role of Meridional Degrees of Freedom on the Existence of Axisymmetric Systems in $f(R)$ Gravity***” and successfully completed as a **principal investigator** during 2014–2015.
2. Obtained a research project from University of the Punjab entitled “***Relativistic Compact Stellar Bodies and Modified Gravity***” and successfully completed as a **principal investigator** during 2015–2016.

MS/MPhil Theses Supervised

2015-2017 Aamna Razaqat

Thesis Title: The Study of LTB Geometry with Tilted and Non-Tilted Congruences in Modified Gravity

2015-2017 Ume Farwa

Thesis Title: Spherical and Cylindrical Stellar Collapse in $f(R, T, R_{\mu\nu}T^{\mu\nu})$ Gravity

Memberships

1. Faculty member, **The Group of Gravitation and Cosmology**, Lahore–Pakistan.
2. Life time member, **Pakistan Physical Society**, Islamabad–Pakistan.

Academic and Research Interests

Cosmology,
Electromagnetic Field Theory,
Geometry, Special & General Relativity,
Modified Gravitational theories,
Mathematical Techniques,
Newtonian Dynamics
Relativistic Astrophysics.

MS/MSc/BS Courses Taught

Computer (Introduction and Applications)-COMP-111
Geometry
Partial Differential Equations
Quantum Mechanics
Real Analysis
Special Theory of Relativity
Vectors and Tensor Analysis

Computer and Software Skills

Math Packages Mathematica, Maple.
OS Windows, Mac OS X.
Typography MS Word, Latex.

Talks Delivered

1. **Some Exact Models of Relativity** at Department of Mathematics, University of the Punjab, Lahore; May 30, 2012.
2. **Electromagnetic Effects on the Stability of Spherical Relativistic Collapse in $f(R)$ Gravity** at Department of Mathematics, University of the Punjab, Lahore; November 6, 2013.
3. **Stability of Charged Spherical Dissipative Collapse in $f(R)$ Gravity** as a poster presentation in an international conference named “Symmetries, Differential Equations and Applications II” at School of Natural Sciences, NUST, Islamabad; January 27–30, 2014.
4. **Energy Density Inhomogeneities with Polynomial $f(R)$ Cosmology** at Department of Mathematics, University of the Punjab, Lahore; October 29, 2014.
5. **Dynamical Instability of Charged Spherical Radiating Collapse in $f(R)$ Gravity** at 1st National Conference on Mathematical Sciences, University of Malakand, Khyber Pakhtunkhwa; September 02–04, 2014.
6. **Dynamical Instability of Relativistic Fluids in $f(R)$ Gravity** at International Conference on Relativistic Astrophysics by Department of Mathematics, University of the Punjab, Lahore; February 10–14, 2015.
7. **A Bird’s Eye of $f(R)$ Gravity** at Department of Mathematics, University of the Punjab, Lahore; February 25, 2015.
8. **Energy Density Irregularities in $f(R)$ Gravity** at 1st UMT National Conference on Pure and Applied Mathematics, University of Management Technology, Lahore; March 07–08, 2015.
9. **Causes of Inhomogeneous Energy Density in Relativistic Fluids with $f(R)$ Background** at 14th Regional Conference on Mathematical Physics, Department of Mathematics, Quaid-i-Azam University, Islamabad; November 09–14, 2015.
10. **Compact Stars and their Evolution** at International Conference on Recent Advances in Applied Mathematics, Department of Mathematics, COMSATS Institute of Information Technology, Lahore; December 17–18, 2015.
11. **Unstable Phases of Collapsing Models** at 1st UMT International Conference in Pure and Applied Science, Centre for Mathematics and its Applications, University of Management Technology, Lahore; March 05–07, 2016.

12. **Dynamical Instability and Cavity Evolution** at 21st International Conference on General Relativity and Gravitation (GR21), Columbia Astrophysics Laboratory, Columbia University, New York–USA; July 10–15, 2016.
13. **An Overview on Cosmic Evolution** (*invited speaker*) at Research Seminar Program, UMT, Sialkot–Pakistan; Dec. 03, 2016.
14. **Differential Geometry, Vectors and Tensors** (*resource person*) at one day workshop organized by Higher Education Department, Punjab at Govt. Post Graduate College for Women, Gujranwala–Pakistan; Dec. 10, 2016.
15. **The Quest of Cosmic and Stellar Evolution** (*invited speaker*) at Bi-Monthly Seminar Series, UMT, Lahore–Pakistan; Dec. 15, 2016.

Conference Proceedings

- 2015 M. Sharif and **Z. Yousof**: *Dynamical Instability Of Relativistic Fluids in $f(R)$ Gravity*, Proc. Int. Conf. Relativ. Astrophys (2015)202.
- 2016 M. Sharif and **Z. Yousof**: *Causes of Inhomogeneous Energy Density in Relativistic Fluids with $f(R)$ Background*, Proc. 14th Reg. Conf. Math. Phys. To appear.

Workshops, Conferences and Seminars

- 2010–Present **Weekly Departmental Seminar Series** in Department of Mathematics, PU, Lahore–Pakistan.
- Oct., 2010 **Lecture Series on Black Holes**, PU, Lahore–Pakistan.
- Nov., 2010 **Lecture Series on Cosmology**, PU, Lahore–Pakistan.
- Feb., 2011 **5th World Conference on 21st Century Mathematics**, ASSMS, Lahore–Pakistan.
- Nov., 2011 **NUST Conference on Mathematical Sciences**, NUST, Islamabad–Pakistan.
- Dec., 2011 **One Day Conference on Gravitation**, PU, Lahore–Pakistan.
- Feb., 2013 **IV Italian-Pakistani Workshop on Relativistic Astrophysics**, NUST, Islamabad–Pakistan.
- March, 2013 **6th World Conference on 21st Century Mathematics**, ASSMS, Pakistan.
- Nov., 2013 **Lecture Series on Cosmology**, PU, Lahore–Pakistan.
- Jan., 2014 **Symmetries, Differential Equations and Applications II**, NUST, Pakistan.
- Sept., 2014 **1st National Conference on Mathematical Sciences**, UoM, Malakand–Pakistan.
- Feb., 2015 **International Conference on Relativistic Astrophysics**, PU, Lahore–Pakistan
- March, 2015 **1st UMT National Conference on Pure and Applied Mathematics**, UMT, Lahore–Pakistan.

- Nov., 2015 **14th Regional Conference on Mathematical Physics**, QAU, Islamabad–Pakistan.
- Dec., 2015 **International Conference on Recent Advances in Applied Mathematics**, Department of Mathematics, COMSATS Institute of Information Technology, Lahore–Pakistan.
- March, 2016 **1st UMT International Conference in Pure and Applied Science**, Centre for Mathematics and its Applications, University of Management Technology, Lahore–Pakistan.
- July, 2016 **21st International Conference on General Relativity and Gravitation (GR21)**, Columbia Astrophysics Laboratory, Columbia University, New York-USA.
- Nov., 2016 **One Day conference on Gravitation and Cosmology**, PU, Lahore-Pakistan.26
- Dec, 2016 **Research Seminar Program**, University of Management and Technology, Sialkot–Pakistan.
- Dec, 2016 **One Day Workshop on Differential Geometry, Vectors and Tensors (Resource Person)**, Govt. Post Graduate College for Women, Gujranwala–Pakistan.
- Dec, 2016 **Bi-Monthly Seminar Series**, University of Management and Technology, Lahore–Pakistan

List of Journal Publications (Indexed by ISI-JCR)

- 2012 M. Sharif and **Z. Yousaf**: *Shear-free Spherically Symmetric Fluid Models*, Chin. Phys. Lett. **29**, 050403 (2012).
- 2012 M. Sharif and **Z. Yousaf**: *Expansion-free Cylindrically Symmetric Models*, Can. J. Phys. **90**, 865 (2012).
- 2012 M. Sharif and **Z. Yousaf**: *Evolution of Expansion-free Self-Gravitating Fluids and Plane Symmetry*, Int. J. Mod. Phys. **21**, 1250095 (2012).
- 2013 M. Sharif and **Z. Yousaf**: *Electromagnetic Field and Dynamical Instability Of Cylindrical Collapse in $f(R)$ Gravity*, Mon. Not. R. Astron. Soc. **432**, 264 (2013).
- 2013 M. Sharif and **Z. Yousaf**: *Dynamical Instability of Charged Expansion-free Spherical Collapse in $f(R)$ Gravity*, Phys. Rev. D **88**, 024020 (2013).
- 2013 M. Sharif and **Z. Yousaf**: *Stability of the Charged Spherical Dissipative Collapse in $f(R)$ Gravity*, Mon. Not. R. Astron. Soc. **434**, 2529 (2013).
- 2013 M. Sharif and **Z. Yousaf**: *Effects of CDTT Model on the Spherical Collapse in Palatini $f(R)$ Gravity*, Eur. Phys. J. C **73**, 2633 (2013).

- 2014 M. Sharif and **Z. Yousaf**: *Cylindrical Thin-shell Wormholes in $f(R)$ Gravity*,
Astrophys. Space Sci. **351**, 351 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Electromagnetic Field and Dynamical Instability Of Collapse with CDTT Model*,
Astropart. Phys. **56**, 19 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Energy Density Inhomogeneities with Polynomial $f(R)$ Cosmology*,
Astrophys. Space Sci. **352**, 321 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Stability Analysis of Cylindrically Symmetric Self-Gravitating Systems in $R + \varepsilon R^2$ Gravity*,
Mon. Not. R. Astron. Soc. **440**, 3479 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Stability of a Class of Non-Static Axial Self-Gravitating Systems in $f(R)$ Gravity*,
Astrophys. Space Sci. **352**, 943 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Instability of Dissipative Restricted Non-Static Axial Collapse with Shear Viscosity in $f(R)$ Gravity*,
J. Cosmol. Astropart. Phys. **06**, 019 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Energy Density Inhomogeneities in Charged Radiating Stars with Generalized CDTT Model*,
Astrophys. Space Sci. **354**, 431 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Dynamical Analysis of Self-Gravitating Stars in $f(R, T)$ Gravity*,
Astrophys. Space Sci. **354**, 471 (2014).
- 2014 M. Sharif and **Z. Yousaf**: *Dynamical Analysis of Radiating Spherical Collapse in Palatini $f(R)$ Gravity*,
Astrophys. Space Sci. **354**, 481 (2014).
- 2015 M. Sharif and **Z. Yousaf**: *Role of Adiabatic Index on the Evolution of Spherical Gravitational Collapse in Palatini $f(R)$ Gravity*,
Astrophys. Space Sci. **355**, 317 (2015).
- 2015 M. Sharif and **Z. Yousaf**: *Dynamics of Spherical Stars with Structure Scalars and $R + \varepsilon R^n$ Cosmology*,
Can. J. Phys. **93**, 905 (2015).
- 2015 M. Sharif and **Z. Yousaf**: *Stability of Regular Energy Density in Palatini $f(R)$ Gravity*,
Eur. Phys. J. C, **75**, 58 (2015).
- 2015 M. Sharif and **Z. Yousaf**: *Dynamics of Relativistic Fluids with Structure Scalars and εR^2 Cosmology*,
Gen. Relativ. Gravit. **47**, 48 (2015).

- 2015 M. Sharif and **Z. Yousaf**: *Radiating Cylindrical Gravitational Collapse with Structure Scalars in $f(R)$ Gravity*,
Astrophys. Space Sci. **357**, 49 (2015).
- 2015 M. Sharif and **Z. Yousaf**: *Instability of Meridional Axial System in $f(R)$ Gravity*,
Eur. Phys. J. C, **75**, 194 (2015).
- 2016 M. Sharif and **Z. Yousaf**: *Charged Adiabatic LTB Gravitational Collapse in $f(R)$ Gravity*,
Int. J. Theor. Phys. **55**, 470 (2016).
- 2016 **Z. Yousaf**, and M.Z. Bhatti: *Electromagnetic Field and Cylindrical Compact Objects in Modified Gravity*,
Mon. Not. R. Astron. Soc. **458**, 1785 (2016).
- 2016 **Z. Yousaf**, K. Bamba and M.Z. Bhatti: *Influence of Modification of Gravity on the Dynamics of Radiating Spherical Fluids*,
Phys. Rev. D **93**, 064059 (2016).
- 2016 M.Z. Bhatti and **Z. Yousaf**: *Influence of Electric Charge and Modified Gravity on Density Irregularities*,
Eur. Phys. J. C **76**, 219 (2016).
- 2016 **Z. Yousaf** and M.Z. Bhatti: *Cavity Evolution and Instability Constraints of Relativistic Interiors*,
Eur. Phys. J. C **76**, 267 (2016).
- 2016 **Z. Yousaf**, K. Bamba and M.Z. Bhatti: *Causes of Irregular Energy Density in $f(R, T)$ Gravity*,
Phys. Rev. D **93**, 124048 (2016).
- 2017 M.Z. Bhatti and **Z. Yousaf**: *Dynamical Variables and Evolution of the Universe*,
Int. J. Mod. Phys. **26**, 1750029 (2017).
- 2017 M. Z. Bhatti and **Z. Yousaf**: *Gravitational Collapse and Dark Universe with LTB Geometry*,
Int. J. Mod. Phys. **26**, 1750045 (2017).
- 2017 **Z. Yousaf**, M.Z. Bhatti and Ume Farwa: *Stability of Compact Stars in $\alpha R^2 + \beta(R_{\gamma\delta} T^{\gamma\delta})$ Gravity*,
Mon. Not. R. Astron. Soc. **464**, 4509 (2017).
- 2017 **Z. Yousaf**, K. Bamba and M.Z. Bhatti: *Role of Tilted Congruence and $f(R)$ Gravity On Regular Compact Objects*,
Phys. Rev. D **95**, 024024 (2017).
- 2017 **Z. Yousaf**: *Relativistic Vacuum Core Models in a Λ -Dominated Era*,
Eur. Phys. J. Plus **132**, 71 (2017).
- 2017 M.Z. Bhatti, **Z. Yousaf** and S. Hanif: *Stability of Anisotropic Compact Objects in $f(T)$ Gravity*,
Mod. Phys. Lett. A **32**, 1750042 (2017).

- 2017 **Z. Yousaf**, M. Z. Bhatti and A. Razaqat: *LTB Geometry with Tilted and Non-Tilted Congruences in $f(R,T)$ Gravity*,
Int. J. Mod. Phys. D **32**, 1750099 (2017).
- 2017 **Z. Yousaf**, M. Z. Bhatti and A. Razaqat: *Electromagnetic effects on the Evolution of LTB Geometry in Modified Gravity*,
Astrophys. Space Sci. **362**, 68 (2017).
- 2017 M. Z. Bhatti, **Z. Yousaf** and S. Hanif, *Role of $f(T)$ Gravity on the Evolution of Collapsing Stellar Model*
Phys. Dark Universe **16**, 34 (2017).
- 2017 M. Z. Bhatti, **Z. Yousaf** and S. Hanif, *Gravitational Collapse in Generalized Teleparallel Gravity*
Eur. Phys. J. Plus **132**, 230 (2017).
- 2017 **Z. Yousaf**, M. Ilyas and M. Z. Bhatti: *Stable Static Spherical Wormhole Models in $f(R,T)$ Gravity*,
Eur. Phys. J. Plus **132**, 268 (2017).
- 2017 **Z. Yousaf**: *Stellar Filaments with Minkowskian Core in Einstein- Λ Gravity*
Eur. Phys. J. Plus **132**, 276 (2017).
- 2017 **Z. Yousaf**, M.Z. Bhatti and Ume Farwa: *Role of $f(R,T, R_{\gamma\delta} T^{\gamma\delta})$ Gravity on the Stability of Cylindrical Stellar Model*
Eur. Phys. J. C **77**, 359 (2017).
- 2017 **Z. Yousaf**, M.Z. Bhatti and Ume Farwa: *Stability Analysis of Stellar Radiating Filaments*,
Class. Quantum Grav. **34**, 145002 (2017).
- 2017 **Z. Yousaf**, M. Z. Bhatti and A. Razaqat: *Evolution of Inhomogeneous LTB Geometry with Tilted Congruences and Modified Gravity*,
Accepted for publications in Can. J. Phys.
- 2017 M. Z. Bhatti, **Z. Yousaf** and S. Ashraf: *Charged Black String Thin-shell Wormholes in Modified Gravity*,
Ann. Phys. **383**, 439 (2017).