

RESEARCH

AREA OF RESEARCH

Fluid Dynamics (Boundary Layer Theory)

Completed Ph.D. under the guidance of Dr. B. B. Singh, Professor and Head, Department of Mathematics, Dr. Babasaheb Ambedkar Technological University, Lonere, Raigad.

Title of the PhD Thesis:

“ON SOLUTIONS OF LAMINAR SIMILARITY BOUNDARY LAYER EQUATIONS OF FLUID FLOWS”

Ph.D. Awarded: December 2019

Brief Sketch of Thesis:

The Thesis consists of seven chapters:

The Chapter I is introductory in nature.

The Chapter II deals with the **MHD slip flows of UCM fluids above porous stretching sheets.**

The Chapter III deals with the **Flow and heat transfer of a nanofluid over a non-linearly stretching/shrinking sheet in presence of thermal radiation, velocity and thermal slips .**

The Chapter IV deals with **MHD heat transfer flow of Casson fluid with velocity and thermal slips over a stretching wedge in the presence of thermal radiation.**

The Chapter V deals with **MHD Hiemenz flow in a porous medium with thermal radiation, velocity and thermal slips effects.**

The Chapter VI deals with **MHD stagnation-point flow and heat transfer over an exponentially stretching/shrinking vertical permeable cylinder.**

The Chapter VII deals with **Coupled heat and mass transfer by natural convection from a radiating vertical thin needle in a porous medium.**

LIST OF PUBLICATIONS

PAPERS PUBLISHED IN JOURNALS

1. **Nasreen Bano** and B. B.Singh, An integral treatment for coupled heat and mass transfer by natural convection from a radiating vertical thin needle in a porous medium, *International Communications in Heat and Mass Transfer*, Vol. 84(2017), pp. 41-48. (Science Citation Index, Thomson Reuters Impact Factor: 3.718, ISSN 0735-1933)
2. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, An integral treatment for dissipative boundary layer flow along a radiating vertical surface convection in a porous medium, *Diffusion Foundations* 11(2017) 191-207.(Peer reviewed and UGC approved)
ISSN: 2296-3642 <https://doi.org/10.4028/www.scientific.net/df.11.191>
3. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, Radiative MHD stagnation-point flow with heat transfer past a permeable stretching/shrinking sheet in a porous medium, *Diffusion Foundations*, 11(2017) 110-128.(Peer reviewed and UGC approved)
ISSN: 2296-3642 <https://doi.org/10.4028/www.scientific.net/df.11.110>
4. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, Analytical solution of MHD slip flow past a constant wedge within a porous medium using DTM-Pade, *Applied Mathematics and*

- Computation, 321(2018) 472-482. (SCI and Scopus indexed and UGC approved)(Thompson Reuter Impact Factor-4.091) ISSN: 0096-3003 <https://doi.org/10.1016/j.amc.2017.10.062>
5. **Nasreen Bano**, B. B. Singh and S.R. Sayyed, Homotopy analysis for MHD Hiemenz flow in a porous medium with thermal radiation, velocity and thermal slips effects, *Frontiers in Heat and Mass Transfer (FHMT)*, 10(2018) 14(1-9). (WoS/Scopus indexed and UGC approved) ISSN: 2151-8629 <https://doi.org/10.5098/hmt.10.14>
 6. **Nasreen Bano**, B. B. Singh and S.R. Sayyed, DTM-Padé treatment for MHD slip flows of UCM fluids above porous stretching sheets, *Special Topics & Reviews in Porous Media — An International Journal*, 9(4) (2018) 379-397. (Scopus Indexed and UGC approved) ISSN: 2151-4798 <https://doi.org/10.1615/specialtopicsrevporousmedia.2018022134>
 7. **Nasreen Bano**, O.D. Makinde, B.B. Singh and S.R. Sayyed, Radiation effect on heat and mass transfer by natural convection from a horizontal surface embedded in a porous medium, *Diffusion Foundation*, 1(2018) 140-157. (Peer reviewed and UGC approved) ISSN: 2296-3642 <https://doi.org/10.4028/www.scientific.net/df.16.140>
 8. **Nasreen Bano**, B.B. Singh and S.R. Sayyed, MHD heat transfer flow of Casson fluid with velocity and thermal slips over a stretching wedge in the presence of thermal radiation , *Diffusion Foundation*, 26(2020) 1-22. (Peer reviewed and UGC approved) ISSN: 2296-3642 <https://doi.org/10.4028/www.scientific.net/df.26.1>
 9. **Nasreen Bano**, B.B. Singh and S.R. Sayyed, MHD stagnation point flow and heat transfer over an exponentially stretching/shrinking vertical permeable cylinder, *Diffusion Foundation*, 26(2020) 23-38. (Peer reviewed and UGC approved) ISSN: 2296-3642 <https://doi.org/10.4028/www.scientific.net/df.26.23>
 10. S.R. Sayyed, B. B. Singh, O. D. Makinde and **Nasreen Bano**, DTM-BF technique for flow and heat transfer of a nanofluid over a non-linearly stretching/shrinking sheet in presence of thermal radiation and partial slip, *Latin American Applied Research*, 50(3)(2020) 185-195. (Science Citation Index) ISSN: 1851-8796
 11. **Nasreen Bano**, B. B. Singh, O. D. Makinde and S.R. Sayyed, DTM-Pade approach to MHD slip flow and heat transfer over a radially stretching sheet with thermal radiation, *Latin American Applied Research*, 50(3)(2020) 175-184. (Science Citation Index) ISSN: 1851-8796
 12. **Nasreen Bano** and S. R. Sayyed, Falkner-Skan Boundary Layer Flow over a Static Wedge, *International Journal of Advanced Research in Science, Communication and Technology*, 3(3)(2023) 114-120. ISSN (Online): 2581-9429 <https://doi.org/10.48175/IJARSCT-8124>

PAPERS PUBLISHED IN PROCEEDINGS

1. B. B. Singh, **Nasreen Bano** and Sayyed S. R., Asymptotic integration of solutions of MHD flow equations with heat and mass transfer due to point sink, *Proceedings of the Mathematical Society (BHU), Varanasi*, Vol. 31(2015), pp. 1-6. (ISSN: 0970-7080).
2. B. B. Singh, **Nasreen Bano** and S.R. Sayyed, Asymptotic integration of the solutions of the unsteady boundary layer equations with a magnetic field, *Proceedings of the Mathematical Society (BHU), Varanasi*, Vol. 31(2015), pp. 7-13 (ISSN 0970-7080).
3. **Nasreen Bano**, B. B. Singh and S.R. Sayyed, MHD slips flow and heat transfer of a radiating viscous fluid over a radially stretching sheet” in the Conference Proceeding of 44th National Conference on Fluid Mechanics and Fluid Power(FMFP 2017) and accepted for publication in journal *Recent Patents in Mechanical Engineering* (Scopus indexed and in UGC list).
4. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, Dissipative effect on heat and mass transfer by natural convection over a radiating needle in a porous medium” in the Conference Proceeding of International Conference on Numerical Heat Transfer and

Fluid Flow (NHTFF-2018) and accepted for publication in Lecture Notes in Mechanical Engineering(peer reviewed journal in UGC list).

5. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, MHD stagnation-point dissipative flow in a porous medium with Joule heating and second-order slip in the Conference Proceeding of 3rd International Conference on Computing, Communication and Signal Processing (ICCASP-2018) and accepted for publication in Springer AISC (Advances in Intelligent Systems and Computing) Series. (ISI and Scopus indexed and in UGC list).
6. **Nasreen Bano**, B. B. Singh and S.R. Sayyed, MHD flow with heat and mass transfer over a radiating cone due to a point sink in presence of partial and solutal slips in the Conference Proceeding of 3rd International Conference on Computing, Communication and Signal Processing (ICCASP-2018) and accepted for publication in Springer AISC(Advances in Intelligent Systems and Computing) Series. (ISI and Scopus indexed and in UGC list).

BOOK/MONOGRAPH PUBLISHED

1. **Nasreen Bano** and Dr. B. B. Singh, On Conceptual Study of Boundary Layer Theory, LAMBERT Academic Publishing (LAP), Germany 2016. (ISBN: 978-3-659-88256-2)
2. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, On the Fundamental Concepts of Fluid Flows, LAP Lambert Academic Publishing, Mauritius 2018. (ISBN: 978-613-9-89030-9)

BOOK CHAPTER

1. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, Dissipative effect on heat and mass transfer by natural convection over a radiating needle in a porous medium, Numerical heat transfer and fluid flow, *Lectures Notes in Mechanical Engineering Series*, Springer, 497-504, 2019. (Scopus Indexed and UGC approved) **ISBN:** 978-981-13-1902-0 **ISSN:** 2195-4356 https://doi.org/10.1007/978-981-13-1903-7_57
2. S.R. Sayyed, B.B. Singh and **Nasreen Bano**, MHD stagnation-point dissipative flow in a porous medium with Joule heating and second-order slip, Computing, Communication and Signal Processing, *Advances in Intelligent Systems and Computing Series*, Springer, 810(2019) 601-609. (Scopus Indexed and UGC approved)
ISBN: 978-981-13-1513-8 https://doi.org/10.1007/978-981-13-1513-8_61
3. **Nasreen Bano**, B. B. Singh and S.R. Sayyed, MHD flow with heat and mass transfer over a radiating cone due to a point sink in presence of partial and solutal slips Computing, Computing, Communication and Signal Processing, *Advances in Intelligent Systems and Computing Series*, Springer, 810(2019) 591-599. (Scopus Indexed and UGC approved)
ISBN: 978-981-13-1513-8 https://doi.org/10.1007/978-981-13-1513-8_60