Curriculum Vitae

Dr. Santanu Raut

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Current Position

Assistant Professor, Mathbhanga College

1 General Information

○ Home Address: *Vill: Tangenmari, P.O.: Rajarhat, Dist: Cooch Behar-736165, West Bengal, India*

○ Language Known: *Bengali, English, Hindi*

○ Gender: *Male*

○ Nationality: *Indian*

○ Religion: *Hinduism*

○ Category: *General*

2 Education

◇ B.Sc, Mathematics (Hons), Physics and Chemistry
A.B.N. Seal College, Cooch Behar, West Bengal

◇ M.Sc (Mathematics)
Department of Mathematics, University of North Bengal, West Bengal

◇ Ph.D. in Mathematics
Department of Mathematics, University of North Bengal, West Bengal
Thesis title: *An introduction to scale free analysis and dynamical system*
Name of the Supervisor: *Prof. D P Datta*

3 Research Interest

3.1 Key Words:

- Partial Differential Equations
- Ordinary differential equation
- Nonlinear differential equation
- Fractals
- Scale free Analysis
- Fractional Calculus
- Nonlinear Dynamics
- Soliton theory
- Dynamical System
- Plasma
- Water wave

4 Courses Taught or Teaching

4.1 Under graduate

Course Instructor for B.Sc Mathematics (Hons and Program) Students, Mathbhanga College

- ▷ Theory of Real Analysis
- ▷ Ordinary and Partial Differential Equations
- ▷ Integration Theory
- ▷ Dynamical Systems
- ▷ Numerical Analysis
- ▷ Matlab and Programming with C

4.2 Post graduate

- ▷ Teaching Mathematics at Cooch Behar Panchanan Barma University for the sessions 2016-2017, 2017-2018 and 2018-2019
- ▷ Teaching Mathematics at Netaji Subhas open University from Jan, 2016 to till day.

5 Attained Workshops

(1) Title: *Second SERC school on nonlinear dynamics (January $04 - 24, 2006$)*
Organizer: Department of Science and Technology (DST), Govt. of India

(2) Title: 3 *Day* $(29th - 31st$ *August,* $2016)$*Workshop on Latex*
Organizer: Cooch Behar College, Cooch Behar, West Bengal, India

(3) Title: *Hyperbolic Partial Differential Equations and Conservation Laws,* 2016
Organizer: Department of Mathematics, University of Calcutta, West Bengal, India

(4) Title: *Recent Advances In Modelling And Computational Techniques In Applied Mathematics,* 2017

Organizer: Department of Mathematics, Indian Institute of Engineering Science and Technology, Shibpur, West Bengal, India

(5) Title: *One Day Workshop on Recent Advances in Mathematics,* 2018
Organizer: Department of Mathematics, Cooch Behar Panchanan Barma University, Cooch Behar, West Bengal, India

(6) Title: *Global Initiative for Academic Networks,* 2018
Organizer: Department of Mathematical Sciences, IIT(BHU), India

6   Papers Presented in Seminar or Conference

(1) Seminar title: *Advance in Mathematics: Celebrating National Mathematical Year,* 2012
Organizer: *Department of Mathematics, University of North Bengal, Siliguri, West Bengal*
Title of Paper: Scale Free ordinary Differential Equation: Novel Solutions

(2) Seminar title: *Ramanujan Day Celebration,* 2015
Organizer: *Assam Academy of Mathematics and Department of Mathematics, Guwahati, India*
Title of Paper: Formation of Cantor Set, Cantor Function using Golden Mean portion of Unity

(3) Seminar Title: *National Seminar on Recent Developments in Mathematics and Its Applications,* 2015
Organizer: *Department of Mathematics, University of Kalyani, West Bengal, India*
Title of Paper: Scale Free ordinary Differential Equation and Time Asymmetric infinitely Differentiable Novel Solution

(4) Seminar Title: *Applications of Generalized Calculus in Physics and Applied Mathematics,* 2016
Organizer: *Jadavpur University and Indian Society of Nonlinear Analysis (Isna)*
Title of Paper: Ultrametric Space and Cantor Set

(5) Seminar Title: *Frontiers in Science and Technology towards Natonal Developement,* 2016
Organizer: *Acharya Brojendra Nath Seal College, Cooch Behar, West Bengal, India*
Title of Paper: Scale Free ordinary Differential Equation and Cantor Set

(6) Seminar Title: *Recent Advances in Basic Science,* 2016
Organizer: *Ishlampur College, Ishlampur, West Bengal, India*
Title of Paper: Solution of Fractional Wave Equations by Fractional Characteristic Method

(7) Seminar Title: *International Seminar on Topology, Analysis and Algebra (Istaa)*-2017
Organizer: *Department of Mathematics, University of North Bengal, West Bengal, India*
Title of Paper: Analytical Solution of Generalized Fractional KdV Equation in Fractal Time Space

(8) Seminar Title: *Contemporary Developments in Social and basic Sciences in Times of Global Crisis,* 2016
Organizer: *Surya Sen Mahavidyalaya, Siliguri, West Bengal, India*
Title of Paper: Solution of Space Time Fractional KdV Burger Equation using Fractional Transformation

(9) Seminar Title: *International Conference on Applied Nonlinear Analysis & Soft Computing,* 2021
Organizer: *Department of Mathematics, Gauhati University, Guwahati, Assam, India*
Title of Paper: Shock solitary and periodic wave solution of the ion acoustic waves for nonextensive dusty Plasmas in the framework of Korteweg-de Vries-Burgers equation with forcing and damping term

7   Books Chapters

(1) Chadha, N. M., Raut, S., Mandal, K. K., Tomara, S., Analytical Solution of a Time-Fractional Damped Gardner Equation Arising from a Collisional Effect on Dust-ion-acoustic Waves in a Dusty Plasma with Bi-Maxwellian Electrons. Handbook of Fractional Calculus for Engineering and Science, CRC Press (Taylor & Francis Group),February, 2022, https://doi.org/10.1201/9781003263517

(2) Raut, S., Roy, S., & Roy, A., A Novel Generalized Method for Evolution Equation and its Application in Plasma. In book: Nonlinear Dynamics and Applications (Springer), October 2022, https://doi.org/10.1007/978-3-030-99792-2_49

(3) Roy, S., Raut, S. & Kairi, R.R., Cylindrical and Spherical Ion-Acoustic Shock and Solitary Waves in a Non-planar Hybrid q-nonextensive Nonthermal Plasma. In book: Nonlinear Dynamics and Applications (Springer), October 2022, https://doi.org/10.1007/978-3-030-99792-2_11

(4) Sarkar, T., Raut, S., Mali, P. C., Propagation of Rarefactive Dust Acoustic Solitary and Shock Waves in Unmagnetized Viscous Dusty Plasma Through the Damped Kadomstev-Petviashvili Burgers Equation. In book: Nonlinear Dynamics and Applications (Springer), October 2022, https://doi.org/10.1007/978-3-030-99792-2_15

(5) Saha, D., Raut, S., Chatterjee, P. C., Multi-soliton Solutions of the Gardner Equation Using Darboux Transformation. In book: Nonlinear Dynamics and Applications (Springer), October 2022, https://doi.org/10.1007/978-3-030-99792-2_9

(6) Raut, S., Roy, S., Kairi, R.R. (2023). Shock, Solitary, and Periodic Wave Solutions of the Ion Acoustic Waves for Nonextensive Dusty Plasma in the Framework of Korteweg-de Vries-Burgers Equation with Forcing and Damping Terms. In: Dutta, H., Ahmed, N., Agarwal, R.P. (eds) Applied Nonlinear Analysis and Soft Computing. ANASC 2020. Advances in Intelligent Systems and Computing, vol 1437. (Springer), Singapore. https://doi.org/10.1007/978-981-19-8054-1_10

(7) Roy, S., Raut, S., Raj Kairi, R. (2024). The Perturbed Potential Kadomtsev-Petviashvili Equation: Bilinear Form, Multi Shock, Kinky-Breather, Resonant Y-Type Shock Solutions. Springer Proceedings in Physics, https://doi.org/10.1007/978-3-031-66874-6_31

(8) Gupta, S., Saha, S., Raut, S., Kumar, V., Hameed, S. (2024). Bilinear Forms, N-soliton Solution for Extended Fifth-Order Korteweg-de Vries (eKdV), Breather. Springer Proceedings in Physics, https://doi.org/10.1007/978-3-031-66874-6_38

(9) Hameed, S., Kumar, V., Saha, S., Raut, S., Gupta, S. (2024). Non-autonomous for Modified Fifth-Order Korteweg-de Vries Equation with Variable Coefficients, Breather, and Soliton. Springer Proceedings in Physics, https://doi.org/10.1007/978-3-031-66874-6_37

(10) Saha, D., Chatterjee, P., Raut, S. (2024). Nonlinear Wave Features of the Time Fractional Gardner Equation Using Darboux Transformation. Springer Proceedings in Physics, https://doi.org/10.1007/978-3-031-66874-6_15

8 Conference Proceeding

(1) Tomar, S., Chadha, N.M., Raut, S., Generalized Solitary Wave Approximate Analytical and Numerical Solutions for Generalized Damped Forced KdV and Generalized Damped Forced MKdV Equations. Part of the Lecture Notes in Networks and Systems book series (LNNS,volume 666) (Springer) 2023, 177-194

(2) Tomar, S. Chadha, N.M., Raut, S.,Bifurcation analysis of generalized damped forced KDV equation and its analytical solitary wave solutions, AIP Conference Proceedings, 2023, 2852(1), 080001, https://doi.org/10.1063/5.0164770

(3) Sarkar, T., Raut, S., Chadha, N.M., Analytical solutions of damped gardner-burgers equation using two expansion methods, AIP Conference Proceedings, 2023, 2852(1), 070001, https://doi.org/10.1063/5.0164419

9   Papers Published in Journals

(1) Datta, D.P., Raut, S., The arrow of time, complexity and the scale free analysis. Chaos, Solitons and Fractals (Elsever), 2006, 28, p. $581 - 589$, https://doi.org/10.1016/j.chaos.2005.07.012

(2) Raut, S., Datta, D. P., Analysis on Fractal set. Fractals (world scinitific), 2009, 17, p. $45 - 52$, https://doi.org/10.1142/S0218348X09004156

(3) Raut, S., Datta, D.P., Non-archimedean scale invariance and cantor sets. Fractals (world scinitific), 2010, 18(1), p. $111 - 118$, https://doi.org/10.1142/S0218348X10004737

(4) Datta, D.P., Raut, S., Ultrametric Cantor sets and growth of measure. P-Adic Numbers Ultrametric Anal. Appl. (Springer), 2011, 3, p. $7 - 22$, https://doi.org/10.1134/S207004661101002X

(5) Datta, D.P., Raut, S., Chaudhuri, A.R., Diffusion in a class of fractal sets. Int. j. appl. math. stat. (CESER), 2012, 30(6), p. $37 - 50$

(6) Ghosh, U., Raut, S., Sarkar, S., Das, S., Solution of space time fractional generalized KdV equation, KdV burger equation and Bona-Mahoney-Burgers equation with dual power-law nonlinearity using complex fractional transformation. J. Math. Comput. Sci. (SICK), 2018, 8(1), p. $114 - 129$, https://doi.org/10.28919/jmcs/3508

(7) Kairi, R.R., Ram Reddy, Ch., Raut, S., Influence of viscous dissipation and thermo-diffusion on double diffusive convection over a vertical cone in a non-Darcy porous medium saturated by a non-Newtonian fluid with variable heat and mass fluxes. Nonlinear engineering (De Gruyter), 2018, 7(1), p. $65 - 72$, https://doi.org/10.1515/nleng-2016-0054

(8) Mukharjee, A., Raut, S., Bagchi, Compactness and regularity via maximal open and minimal closed sets in topological spaces, Scientific Studies and Research Series Mathematics and Informatics (University of Bacau), 2018, Vol. 28(1) p $53 - 60$,

(9) Mondal, K.K., Roy, A., Chatterjee, P., Raut, S., Propagation of Ion-Acoustic Solitary Waves for Damped Forced Zakharov Kuznetsov Equation in a Relativistic Rotating Magnetized Electron-Positron-Ion Plasma. Int. J. Appl. Comput. Math, (Springer), 2020, 6(3), 55, https://doi.org/10.1007/s40819-020-0801-1

(10) Datta, D.P., Sarkar S., Raut, S., Novel Excitation of local fractional dynamics. Nonlinear Studies (Cambridge Scientific Publishers Ltd.), 2020, 27(4), https://doi.org/10.48550/arXiv.1904.00777

(11) Ghosh, U., Ali, M. R., Raut, S., Sarkar, S., Das, S., D-Alembert's solution of fractional wave equations using complex fractional transformation. Nonlinear Sci. Lett. A (Asian Academic Publisher), 2020, 9(4), $p. 299 - 311$, https://doi.org/10.48550/arXiv.1712.07334

(12) Raut, S., Mondal, K.K., Chatterjee, P., Roy, A., Propagation of dust-ion-acoustic solitary waves for damped modified Kadomtsev-Petviashvili-Burgers equation in dusty plasma with a q-nonextensive nonthermal electron velocity distribution. SeMA Journal (Springer), $2021, 78(4) 571 - 593$, https://doi.org/10.1007/s40324-021-00242-5

(13) Ali, M. R., Raut, S., Sarkar, S., Ghosh, U., Unraveling the combined actions of a Holling type III predator-prey model incorporating Allee response and memory effects. Comput. math. methods (Wiley), 2021, 3(2), $e1130$, https://doi.org/10.1002/cmm4.1130

(14) Kairi, R.R., Shaw, S., Roy, S., Raut, S., Thermo-solutal Marangoni Impact on Bioconvection in Suspension of Gyrotactic Microorganisms over an Inclined Stretching Sheet. Journal of Heat Transfer (AMSE), 2021, 143(3), 031201, https://doi.org/10.1115/1.4048946

(15) Raut, S., Mondal, K.K., Chatterjee, P., Roy, A., Two-dimensional ion-acoustic solitary waves obliquely propagating in a relativistic rotating magnetised electron-positron-ion plasma in the presence of external periodic force. Pramana - Journal of Physics (Springer), 2021, 95(2), 73, https://doi.org/10.1007/s12043-021-02104-1

(16) Saha, S., Biswas, P., Raut, S., Das, A.N., Convective heat transfer of laminar nano-fluids flow through a rectangular micro-channel with different types of baffle-corrugation. International Journal for Computational Methods in Engineering Science and Mechanics (Taylor & francis), $2021, 22(2), p.1 - 11$, https://doi.org/10.1080/15502287.2021.1894509

(17) Roy, S., Saha, S., Raut, Das A. N., Studies on the effect of kinematic viscosity on electron-acoustic cylindrical and spherical solitary waves in a plasma with trapped electrons. Journal of Applied Mathematics and Computational Mechanics (Springer), 20(2):65-76, 2021, 20(2), $p.65 - 76$, https://doi.org/10.17512/jamcm.2021.2.06

(18) Roy, S., Kairi, R.R. & Raut, S. Cylindrical and Spherical Dust-Ion-Acoustic Shock Solitary Waves by Korteweg-de Vries-Burgers Equation. Braz J Phys (Springer), $(2021) 51(4) 1651 - 1660$, https://doi.org/10.1007/s13538-021-00960-1

(19) Saha, S., Biswas, P., Raut, S., Das, A.N., Numerical simulations of turbulent airflow phenomena and characteristics of heat transfer through a rectangular microchannel with mixed type baffles. International Journal of Fluid Mechanics Research (Begell House), $2021, 48(3), 1 - 16$, https://doi.org/10.1615/InterJFluidMechRes.2021038524

(20) Raut, S., Roy, S., Kairi, R. R., Chatterjee, Approximate Analytical Solutions of Generalized Zakharov-Kuznetsov and Generalized Modified Zakharov-Kuznetsov Equations. Int. J. Appl. Comput. Math (Springer), $2021, 7, 157$, https://doi.org/10.1007/s40819-021-01034-1

(21) Saha, S., Raut, S., Das, A.N., INFLUENCE OF DIFFERENT TYPES OF BAFFLE ARRANGEMENT AND SPACING ON HYDROTHERMAL FLOW PHENOMENA OVER A RECTANGULAR CHANNEL. International Journal of Fluid Mechanics Research (Begell House), $2021, 49(1), p.47 - 56$, https://doi.org/10.1615/InterJFluidMechRes.2022040394

(22) Saha, S., Raut, S., Das, A.N., Enhancement of turbulent airflow and heat transfer through a rectangular microchannel with different types of baffles. Journal of Applied Mathematics and Computational Mechanics (Czestochowa University of Technology), $2021, 20(3), p.41 - 52$, https://doi.org/10.17512/jamcm.2021.3.04

(23) Raut, S., Roy, A., Mondal, K.K., Chatterjee, Chadha, N. M., Non-stationary Solitary Wave Solution for Damped Forced Kadomtsev-Petviashvili Equation in a Magnetized Dusty Plasma with q-Nonextensive Velocity Distributed Electron. Int. J. Appl. Comput. Math (Springer), $2021, 7 : 223$, https://doi.org/10.1007/s40819-021-01168-2

(24) Saha, S., Raut, S., Das, A.N., ANALYSIS OF THERMAL ENHANCEMENT IN A BAFFLED RECTANGULAR CHANNEL WITH DIFFERENT FORMS OF OUTLET. Journal of the Serbian Society for Computational Mechanics (Serbian Society for Computational Mechanics), $2021, 15(1), p.24 - 36$, https://doi.org/10.24874/jsscm.2021.15.01.02

(25) Saha, S., Biswas, P., Raut, S., Das, A.N., Analysis of heat transfer characteristics through an rectangular enclosure, Materials today proceedings (Elsever), 47(11), Pages 2905-2911, 2021, https://doi.org/10.1016/j.matpr.2021.04.191

(26) Raut, S., Mondal, K.K., Chatterjee, Roy, A., Two-dimensional ion-acoustic solitary waves obliquely propagating in a relativistic rotating magnetised electron-positron-ion plasma in the presence of external periodic force. Pramana - J Phys (Springer), $2021, 95(73)$, https://doi.org/10.1007/s12043-021-02104-1

(27) Roy, S., Raut, S., and Kairi, R. R., Thermo-solutal Marangoni Bioconvection of a Non-Newtonian Nanofluid in a Stratified Medium. J. Heat Transfer (AMSE), $2022; 144(9) : 093601$, https://doi.org/10.1115/1.4054770

(28) Sarkar, T., Raut, S., Mali, P. C., The Classification of the Exact Single Travelling Wave Solutions to the Constant Coefficient KP-mKP Equation Employing Complete Discrimination System for Polynomial Method. Computational and Mathematical Methods (Wiley), $2022 - 03 - 25$, https://doi.org/10.1155/2022/3844031

(29) Roy, S., Raut, S. & Kairi, R.R., Nonlinear analysis of the ion-acoustic solitary and shock wave solutions for non-extensive dusty plasma in the framework of modified Korteweg-de Vries-Burgers equation. Pramana - J Phys (Springer), $2022, 96, 67$, https://doi.org/10.1007/s12043-022-02302-5

(30) Roy, A., Raut, S. & Barman, R. Studies on the Effect of Dust-Ion Collision on Dust-Ion Acoustic Solitary Waves in a Magnetized Dusty Plasma in the Framework of Damped KP Equation and Modified Damped KP Equation. Plasma Phys. Rep. (Springer), 2022, 48, p.367 − 383, https://doi.org/10.1134/S1063780X22040018

(31) Palit, A., Roy, A. & Raut, S. Qualitative studies of the influence of damping and external periodic force on ion-acoustic waves in a magnetized dusty plasma through modified ZK equation. Braz J Phys (Springer), 2022, 52, 110, https://doi.org/10.1007/s13538-022-01083-x

(32) Roy, S., Raut, S., Kairi, R.R. et al. Integrability and the multi-soliton interactions of non-autonomous Zakharov-Kuznetsov equation. Eur. Phys. J. Plus (Springer), 2022, 137, 579, https://doi.org/10.1140/epjp/s13360-022-02763-y

(33) Roy, A., Mondal, K.K., Chatterjee, Raut, S., Influence of External Periodic Force On Ion Acoustic Waves in a Magnetized Dusty Plasma Through Forced KP Equation and Modified Forced KP Equation. Braz J Phys (Springer), 2022, 52, 65, https://doi.org/10.1007/s13538-021-01038-8

(34) Raut, S., Roy, S., Saha, S., Das, A.N., Effect of Kinematic Viscosity on Ion Acoustic Waves in Superthermal Plasma Comprising Cylindrical and Spherical Geometry. Int. J. Appl. Comput. Math (Springer), 2022, 8(4), https://doi.org/10.1007/s40819-022-01418-x

(35) Palit, A., Datta, D.P., Raut, S., Efficient Computation of Periodic Orbits of Forced Rayleigh Equation in the Framework of Novel Asymptotic Structures. Indian Journal of Mathematics (Alla. Math. Society) 2022, 64(1), 1 − 48,

(36) Kairi, R.R., Roy, S., Raut, S., Stratified thermosolutal Marangoni bioconvective flow of gyrotactic microoranisms in Williamson nanofluid. European Journal of Mechanics - B/Fluids, (Elsever), 2022, 97, 274 − 281, https:// doi.org/10.1016/j.euromechflu.2022.09.004

(37) Roy, S., Raut, S., Kairi, R.R. et al. Bilinear Backlund, Lax pairs, breather waves, lump waves and soliton interaction of (2+1)-dimensional non-autonomous Kadomtsev-Petviashvili equation. Nonlinear Dyn, (Springer), (2022) https://doi.org/10.1007/s11071-022-08126-7

(38) Sarkar, T., Roy, S., Raut, S., Mali, P.C., Studies on the Dust Acoustic Shock, Solitary, and Periodic Waves in an Unmagnetized Viscous Dusty Plasma with Two-Temperature Ions. Braz J Phys (Springer), 2023, 53(1), 12, https://doi.org/10.1007/s13538-022-01221-5

(39) Raut, S., Barman, R., Sarkar, T., Integrability, breather, lump and quasi-periodic waves of non-autonomous Kadomtsev?Petviashvili equation based on Bell-polynomial approach. Wave Motion (Elsever), Volume 119, June 2023, 103125 https://doi.org/10.1016/j.wavemoti.2023.103125

(40) Saha, D., Chatterjee, P., Raut, S., Multi-shock and soliton solutions of the Burgers equation employing Darboux transformation with the help of the Lax pair. Pramana - Journal of Physics (Springer), 2023, 97(2), 54, DOI: 10.1007/s12043-023-02534-z

(41) Singh, M.K., Rahul, A.K., Saha, S. et al. Mathematical analysis of dynamic phenomena of moving load on a gravitational elastic plate resting on water medium. Indian J Phys (Springer), 2023, 97(6), https://doi.org/10.1007/s12648-023-02679-y

(42) Chadha, N.M., Tomar, S., Raut, S., Parametric analysis of dust ion acoustic waves in superthermal plasmas through non-autonomous KdV framework. Communications in Nonlinear Science and Numerical Simulation (Elsevier), 2023, 123, 107269, DOI: 10.1016/j.cnsns.2023.107269

(43) Das, A.N., Saha, S., Raut, S., Talukdar, P., Studies on Ion-Acoustic Solitary Waves in Plasmas with Positrons and Two-Temperature Superthermal Electrons through Damped Zakharsov Kuznetsov Burgers Equation. Plasma Physics Reports (Springer), 2023, 49(4) : 454 − 466, DOI: 10.1134/S1063780X22601171

(44) Raut, S. Sarkar, T., Mali, P. C., Alotaibi, B. M., Ismaeel, S. M. E., El-Tantawy, S., On the propagation and interaction of ion-acoustic solitary, periodic, shock, and breather waves in a non-Maxwellian electron-positron-ion magnetoplasma. Physics of Fluids (AIP), 2023, 35(5) DOI: 10.1063/5.0150737

(45) Biswas, S., Ghosh, U., Raut, S., Construction of fractional granular model and bright, dark, lump, breather types soliton solutions using Hirota bilinear method. Chaos, Solitons and Fractals (Elsevier), 2023, 172, 113520, DOI: 10.1016/j.chaos.2023.113520

(46) Raut, S., Mondal, K.K., Chatterjee, P., Roy, S., Dust ion acoustic bi-soliton, soliton, and shock waves in unmagnetized plasma with Kaniadakis-distributed electrons in planar and nonplanar geometry, European Physical Journal D (Springer), 2023, 77(6), 100, DOI: 10.1140/epjd/s10053-023-00676-8

(47) Raut, S., Saha, S., Das, A.N., Talukder, P., Complete discrimination System method for finding exact solutions, dynamical properties of combined Zakharsov-Kuznetsov-modified Zakarsov-Kuznetsov equation. Alexandria Engineering Journal (Elsevier), 2023, 76, pp. 247-257, https://doi.org/10.1016/j.aej.2023.06.020

(48) Raut, S., Ma, W., Barman, R., & Roy, S. (2023). A non-autonomous Gardner equation and its integrability: Solitons, positons and breathers. Chaos, Solitons & Fractals (Elsevier), 176, 114089. https://doi.org/10.1016/j.chaos.2023.114089

(49) Chatterjee, P., Saha, D., Wazwaz, AM., Raut, S., Explicit solutions of the Schamel-KdV equation employing Darboux transformation. Pramana - J Phys (Springer), 97, 172 (2023). https://doi.org/10.1007/s12043-023-02657-3

(50) Das, S., Raut, S., Mandol, K.K, Analyzing the effects of suction and injection Reynolds number on the transport process in a hydromagnetic flow through a channel of reactive porous walls. Chinese Journal of Physics (Elsevier), 87, February 2024, Pages 510-524 (2024). https://doi.org/10.1016/j.cjph.2023.12.022

(51) Raut, S., Sarkar, T., Roy, S. et al. Characteristic of integrability of nonautonomous KP-modified KP equation and its qualitative studies: soliton, shock, periodic waves, breather, positons and soliton interactions. Nonlinear Dyn (Springer), 112, 9323-9354 (2024). https://doi.org/10.1007/s11071-024-09378-1

(52) Zhang, J., Manafian, J., Raut, S. et al. Study of two soliton and shock wave structures by weighted residual method and Hirota bilinear approach. Nonlinear Dyn (Springer), 112, 12375-12391 (2024). https://doi.org/10.1007/s11071-024-09706-5

(53) Alhejaili, W., Roy, S., Raut, S. et al. On the integrability, multi-shocks, high-order kinky-breathers, L-lump-kink solutions for the non-autonomous perturbed potential Kadomtsev-Petviashvili equation. Nonlinear Dyn (Springer), 112, 13335-13359 (2024). https://doi.org/10.1007/s11071-024-09707-4

(54) Raut S. Integrability, and stability aspects for the non-autonomous perturbed Gardner KP equation: solitons, breathers, Y-type resonance and soliton interactions. Wave Motion (Elsevier), 2024 Jun 23:103373.

(55) Pal, N. K., Nasipuri, S., Chatterjee, P.,& Raut, S. Bilinear Bäcklund transformation, Lax pair, Darboux transformation, multi-soliton, periodic wave, complexiton, higher-order breather and rogue wave for geophysical Boussinesq equation. Pramana (Springer), 98(3), 110 (2024). https://doi.org/10.1007/s12043-024-02773-8

(57) Alhejaili, W., Roy, S., Raut, S. et al. Analytical solutions to (modified) Korteweg-de Vries-Zakharov-Kuznetsov equation and modeling ion-acoustic solitary, periodic, and breather waves in auroral magnetoplasmas. Phys. Plasmas (AIP) 31, 082107 (2024). https://doi.org/10.1063/5.0220798

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(59) Alhejaili, W., Shah, R., Salas, A.H. et al. On the soliton-type and other physical solutions for the space-time fractional Kraenkel-Manna-Merle model. Pramana - J Phys (Springer), 98, 150 (2024). https://doi.org/10.1007/s12043-

024-02833-z

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10   Patent

TITLE OF INVENTION: A SYSTEM AND METHOD FOR ANALYSING BLOOD FLOW BIFURCATION TO PREDICT CARDIAC ARREST
Field of Innovation: BIO-MEDICAL ENGINEERING
Application Number: 202341063678
Publication Date: (U/S 11A) 06/10/2023
INTELLECTUAL PROPERTY INDIA
Office of the Controller General of Patients, Design and Trade Marks
Department of Industrial Policy and Promotion
Ministry of Commerce and Industry
Government of India

11   PhD Supervision Experience

(1) Name of the scholar: Ashim Roy
Position: Supervisor
Name of the Institute: **Cooch Behar Panchanan Barma University**, Cooch Behar-736101 West Bengal, India
Title: ON SOME ASPECTS OF INTEGER AND FRACTIONAL ORDER NONLINEAR DYNAMICAL SYSTEMS
Present status: Awarded

(2) Name of the scholar: Subrata Roy
Position: Co-Supervisor
Name of the Institute: **Cooch Behar Panchanan Barma University**, Cooch Behar-736101 West Bengal, India
Title: A STUDY ON THE SOLUTIONS OF NONLINEAR PARTIAL DIFFERENTIAL EQUATIONS EMPHASIZED FLUIDS AND PLASMAS
Present status: Continuing

(3) Name of the scholar: Tanay Sarkar
Position: Co-Supervisor
Name of the Institute: **Jadavpur University**, 188, Raja Subodh Chandra Mallick Rd, Jadavpur, Kolkata- 700032, India
Title: STUDIES ON THE CLASS OF NON-AUTONOMOUS EVOLUTIONARY EQUATIONS: INTEGRABILITY, EXACT SOLUTIONS, QUALITATIVE ANALYSIS AND APPLICATIONS IN THE PLASMA DYNAMICS
Present status: Continuing

(4) Name of the scholar: Dipan Saha
Position: Co-Supervisor
Name of the Institute: **VISVA-BHARATI**, Sriniketan-731236, West Bengal, India

Title: PARTIAL DIFFERENTIAL EQUATIONS WITH SPECIAL EMPHASIS ON LAX PAIR AND DARBOUX TRANSFORMATIONS
Present status: Continuing

12 Peer Reviewer in Journals

(1) Chaos, Solitons & Fractals.
(2) Nonlinear Dynamics.
(3) Physics of Fluids.
(4) Wave motion.
(5) European Physical Journal Plus.
(6) Numerical Heat Transfer, Part A: Applications.
(7) Alexandria Engineering Journal.
(8) Biomedical Signal Processing and Control.
(9) Ain Shams Engineering Journal.
(10) Journal of Mathematical Analysis and Applications, etc.

13 Research Collaborators

13.1 National:

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(3) S. A. El-Tantawy, Department of Physics, Faculty of Science, Port Said University, Port Said 42521, Egypt

14 Administrative Experience

(1) Teacher-in-charge, Mathabhange College, Mathabhanga, Cooch Behar-736146 West Bengal, India, (For six-months).

(2) Member of Board of Studies, Cooch Behar Panchanan Barma University, Cooch Behar-736101 West Bengal, India, (For three years).

(3) Member of Research Advisory Committee, Cooch Behar Panchanan Barma University, Cooch Behar-736101 West Bengal, (Since, November, 2019 till day).

(4) Academic Coordinator, Netagi Suvash Open University, Cooch Behar Study Centre, Cooch Behar-736101 West Bengal, India, (For Four year).

(5) Coordinator, Rabindra Bharati University, Mathabhange College Study Centre, Cooch Behar-736146 West Bengal, India, (For one years).

(6) Members of School Managing Committee, Rajarhat High School (H.S.), NH31, Rajarhat, West Bengal-736165. India, (For three years).

(7) Members of Governing Body of Mekliganj College (University Nominee), Mekliganj College, Mekliganj, Cooch Behar, West Bengal-735304, India, (Since, November, 2021, till day).

(8) Members of Governing Body of Mathabhanga College (Teachers Representative), Mathabhanga College, Mathabhanga, Cooch Behar, West Bengal-736165, India, (Since, November, 2023, till day).