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Nota di contenuto	Intro -- Preface -- Organization -- Contents -- Nonlinear Waves and Plasma Dynamics -- Strong Landau Damping of Electron Plasma Waves and Vortical Analysis of the Formed Electron Holes -- 1 Introduction -- 2 Methodology -- 2.1 Governing Equations -- 2.2 Numerical Techniques -- 3 Results and Discussion -- 3.1 Nonlinear Landau Damping and Formation of Electron Phase-Space Holes -- 3.2 Phase-Space Fluid-Analogous Analysis of the Electron Holes -- 4 Conclusion -- References -- Bifurcation Analysis and the Influence of (r,q) Distribution on Ion-Acoustic Kinetic Alfven Waves -- 1 Introduction -- 2 Governing Equations -- 3 Derivation of the Korteweg de-Vries Equation -- 4 Formation of Dynamical System for the KdV Equation -- 4.1 Solitary Wave Solution -- 5 Conclusions -- References -- Propagation of Ion Acoustic Solitons Around the Critical Values in Weakly Relativistic Unmagnetized Plasmas Having Nonthermal Distributed Electrons and Positrons -- 1 Introduction -- 2 Theoretical Model Equations -- 3 Formation of mKdVE -- 4 Results and Discussion -- 5 Conclusion -- References -- Comparative Study of Small Amplitude Dust Ion Acoustic Korteweg-de Vries and Modified Korteweg-de Vries Solitons in a Dusty Plasma with Weak Relativistic Electrons -- 1 Introduction -- 2 Governing Equations Defining the Plasma System -- 3 Derivation of Nonlinear Wave Equations -- 3.1 Derivation of KdV Equation of Quadratic Nonlinearity -- 3.2 Derivation of mKdV Equation of Cubic Nonlinearity -- 3.3 Solution of Nonlinear Wave Equations -- 4 Results and Discussion -- 5 Conclusion -- References -- Nonlinear Propagation of Ion-Acoustic Soliton in a Magnetized Three Component Relativistic Plasma -- 1 Introduction -- 2 Theoretical Model Equations -- 3 Formation of KdVE -- 4 Results and Discussion -- 5 Conclusions -- References. Gardner Solitons and Double Layers in Self-gravito-Electrostatic Opposite Polarity Magnetized Dusty Plasmas -- 1 Introduction -- 2 The Model -- 3 Derivation and Solution of the KdV Equation -- 4 Derivation and Solution of the mKdV Equation -- 5 The SG Equation -- 5.1 Derivation of SG Equation -- 5.2 SWs Solution of SG Equation -- 5.3 DLs Solution -- 6 Discussion and Conclusion -- References -- Propagation of Nonlinear Dust Acoustic Solitons in an Inhomogeneous Magnetized Plasma -- 1 Introduction -- 2 Governing Equations and Derivation -- 3 Results and Discussion -- 4 Conclusion -- References -- Study of Upper Hybrid Waves Instability in Collisional Magneto Gallium Antimonide (GaSb) Semiconducting Plasma System -- 1 Introduction -- 2 Physical and Mathematical Modelling of Problem -- 3 Results and Discussion -- 4 Conclusion -- References -- Study on Atmospheric Internal Waves Phenomenon Model by Variational Iteration Transform Method -- 1 Introduction -- 2 Definition and Preliminaries -- 2.1 Shehu Transform Properties -- 3 Variational Iteration Transform Method -- 4 Convergence of VITM -- 5 Application -- 6 Result and Discussion -- 7 Conclusion -- References -- Nonextensive Effect on the Lump Soliton Structures in Dusty Plasma -- 1 Introduction -- 2 Governing Equations -- 3 Normalized Equations -- 4 Formation of the Kadomtsev-Petviashvili Equation -- 4.1 Stretched Co-ordinates and Perturbation -- 4.2 Well Known KP Equation -- 5 Lump Soliton of the KP Equation -- 6 Results and Discussions -- 7 Conclusion --

References -- A Study on Hybrid Solutions and Their Interactions in the Extended Nonlinear Schrödinger equation -- 1 Introduction -- 2 Generalized Darboux Transformation Method -- 3 Soliton and Positon Interactions -- 3.1 One Soliton - Second Order Positon Interaction -- 3.2 Two Soliton - Second Order Positon Interaction.
3.3 One Soliton - Third Order Positon Interaction -- 4 Breathers and Breather-Positon Interactions -- 5 Conclusion -- References -- Exact Traveling Wave Solutions of the Fractional Type Kuramoto-Sivashinsky (KS-Equation) Equation by G'G-Expansion Method -- 1 Introduction -- 2 Preliminaries -- 3 Methodology of the(G'G)-Expansion Method -- 4 Application of G'G-Expansion Method -- 4.1 To Evaluate the Wave Solution of Fractional Non-Linear Kuramoto-Sivashinsky (KS-Equation) Equation -- 5 Conclusion -- References -- Dust-Acoustic Multi-solitons and Shock in a Polarized Space Dusty Plasma Using Darboux Transformation -- 1 Introduction -- 2 Basic Fluid Equations -- 3 Derivation of the Burger's Equation -- 4 Solutions of the Burger's Equation Using the Darboux Transformation -- 5 Solitons and Shocks -- 6 Conclusions -- References -- Solitons and Resonance in Fractional Sawada-Kotera Equation Using Hirota Bilinear Method -- 1 Introduction -- 2 Fractioanl Calculus -- 2.1 Definition-1 -- 2.2 Definition-2 -- 2.3 Definition-3 -- 3 Mathematical Formulation -- 3.1 Hirota Bilinear Method -- 3.2 One-Soliton Solution -- 3.3 Two-Soliton Solution -- 4 Results and Discussions -- 5 Conclusion -- References -- Nonlinear Wave Features of the Time Fractional Gardner Equation Using Darboux Transformation -- 1 Introduction -- 2 Transformation -- 3 Lax Pair -- 4 Darboux Transformation (DT) and Soliton nonlinear Wave Features of the time fractional Gardner equation -- 4.1 One-Soliton nonlinear Wave Features -- 4.2 Two-Soliton nonlinear Wave Features -- 5 Results and Discussions -- 6 Conclusions -- References -- Excitation of Pinned Solitons by Moving Charge Debris in a Plasma with Kappa-Distributed Electrons -- 1 Introduction -- 2 Model Equations -- 2.1 External Perturbation: Charged Debris -- 3 Pseudo-Potential Analysis -- 4 Numerical Simulation Results.
5 Discussion and Conclusions -- References -- Bifurcation of Small Amplitude Dust-Acoustic Waves in Two-Temperature Ions Dissipative Plasmas -- 1 Introduction -- 2 Governing Equations -- 3 Burgers Equation -- 3.1 Formation of Dynamical System and Wave Solutions -- 4 The Modified Burgers Equation -- 4.1 Formation of Dynamical System and Wave Solutions -- 5 Result Discussions -- 6 Conclusions -- References -- Multi-soliton Solution and Periodic Solution of the Fractional Lax Equation Using by Darboux Transformation -- 1 Introduction -- 2 Preliminaries and Definitions -- 2.1 Definition -- 2.2 Fractional Integral Operator -- 2.3 Modified Riemann-Liouville Fractional Derivative -- 3 Fractional Complex Transformation -- 4 Lax Pair and Darboux Transformation -- 5 Solution of the Fractional Lax Equation -- 5.1 One Solitary Wave Solution and Singular Solitary Wave Solution -- 5.2 Singular Periodic Solitary Wave Solution -- 5.3 Two Soliton Solution -- 6 Conclusion -- References -- Study of Modulational Instability in Bose-Einstein Condensates with Spin-Orbit Coupling in Staggered Mode -- 1 Introduction -- 2 The Model -- 3 Linear Stability Analysis -- 4 Results and Discussion -- 5 Conclusion -- References -- Ion Acoustic Cnoidal Waves in an Ion-Beam Multispecies Plasma -- 1 Introduction -- 2 Plasma Fluid Model -- 2.1 KdV Equation: Derivation and its Solution -- 3 Solution of KdV Equation: Cnoidal Wave -- 4 Numerical Analysis -- 5 Conclusions -- References -- Nonlinear Ion Acoustic Wave Excitations in Magnetized Plasma with Cairns Hot and Cold Electron Distribution and Monoenergetic Electron Beam -- 1 Introduction -- 2 Basic Equations -- 3 Nonlinear Analysis and the KdV

Equation -- 4 Solution of KdV Equation and Discussion -- 5 Conclusion -- References -- Bifurcation of Ion-Acoustic Waves in Venus' Upper Ionosphere -- 1 Introduction -- 2 Basic Equations.
3 The Korteweg-de vries (KdV) equation -- 4 Dynamical System and the KdV Equation -- 4.1 Phase Plane Analysis -- 4.2 Solitary and Periodic Wave Solutions -- 5 Conclusion -- References -- Bifurcation Study of Nonlinear Spherical Structure for Degenerate Electron-Positron Quantum Plasma -- 1 Introduction -- 2 Governing Equations -- 3 Bifurcation of Reduced SKP Equation -- 4 Numerical Results and Discussion -- 5 Conclusions -- References -- Propagation of Two-Soliton in a Compressible Hyperelastic Rod -- 1 Introduction -- 2 Basic Equations -- 3 KdV Equation -- 4 Two-Soliton -- 5 Variation of Two-Soliton and Phase Shift -- 6 Conclusion -- References -- Spin-Orbit Coupled Rotating Spin-1 Bose-Einstein Condensates Under the Influence of External Magnetic Field -- 1 Introduction -- 2 Mean-Field Model and Hamiltonian -- 3 Results and Discussions -- 4 Conclusions -- References -- Nonlinear Evolutionary Stages of a Dispersive Kappa Distributed Magnetized Plasma -- 1 Introduction -- 2 Problem Design -- 2.1 Limits of the Distribution Function -- 2.2 Governing Equations -- 2.3 Derivation of the Evolutionary Equation -- 3 Results -- 3.1 Parametric Dependence: Numerical Analysis -- 3.2 Dynamical System and Stability Analysis -- 4 Conclusion -- References -- Inhomogeneity Effects on Energy and Instability of Ion-Acoustic Solitary Waves in Quantum Magnetized Plasma -- 1 Basic Equations of The Model -- 2 Derivation of the VZK Equation -- 3 Solitary Wave Analysis -- 4 Stability Analysis -- 5 Discussion and Conclusions -- References -- Bounds on the Phase Speed of Swirling Flows -- 1 Introduction -- 2 Heterogeneous Stability Equation -- 3 Instability Region -- 4 Concluding Remarks -- References -- Dynamics of Ion-Acoustic Waves in a Magnetised Plasma with Two-Temperature Superthermal Electrons -- 1 Indroduction -- 2 Governing Equations -- 3 Formation of the ZK Equation.
4 Dynamical Properties of IAWs.

Sommario/riassunto

This book covers the latest advancements and applications of nonlinear dynamics in various fields of science and engineering, presenting a curated selection of peer-reviewed contributions at the 2nd International Conference on Nonlinear Dynamics and Applications (ICNDA 2024) at Sikkim Manipal Institute of Technology (SMIT). Organized by the Department of Mathematics, SMIT, SMU, this international conference provides a platform for scientists, researchers, and inventors to share their findings and exchange ideas in the ever-evolving field of nonlinear dynamics. This book comprises three volumes. Volume 1 focuses on the investigation of nonlinear waves and plasma dynamics. It covers topics such as strong Landau damping, electron plasma waves, ion-acoustic waves, dusty plasma, dust-acoustic waves, dust-ion-acoustic waves, kinetic Alfven waves, solitary wave, shock waves, periodic wave, cnoidal wave, superperiodic wave, soliton, resonance, lump soliton, multi-soliton, breather wave, upper hybrid wave, atmospheric internal wave, mathematical and analytical methods, quantum and relativistic plasmas, wave instabilities and interactions, fractional and complex systems, nonlinear optical phenomena, Gaussian laser beam, chaos and multistability, and other specific plasma studies.