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Nota di contenuto	Active Objects and the Higgs Field in the Quark-gluon Model of Fractal Systems -- Influence of Variable Amplitude and Modulation of the Fractal Index on the States of the Deformation Field of Coupled Structures -- Orbital Waves and Quantum Densities from Time-Discrete Chaotic Sequences -- Changes in the Rock Mass Geomechanical Properties with Account of the Chaos Theory Based on a Computational Experiment -- Effects of Frustrated Interactions on Synchronicity in Electrical Power Grids -- Chaotic Properties of new 1-D and 2-D Maps -- Transformation of Master-slave Systems with Harmonic Terms for Improved Stability in Numerical Continuation -- One-dimensional Map Without Fixed Points and with Amplitude Control -- Smoluchowski Approximation: Analysis of Reaction-diffusion Systems with Long-range spreading -- Dynamic Isotropic Percolation Process: Renormalization Group Analysis -- 2-D Generalized Turing Maps and Discrete Limit Cycles with Phase Shift -- Strong Coupling Asymptotics of RG-function -- The Origin of Dissipation in Quantum Many-Body Systems -- Role of the Boundary Conditions in the Graphs Split at Vertices -- Simulation and Optimisation Techniques for Construction of a Probability Box Structure -- Reliability-Based Numerical Analysis of Spread Foundations Incorporating Spatial Variability on a Complex

Substratified Layered Medium -- Critical Dynamics of the Superfluid Phase Transition. Calculation of  $z$  critical exponent and Stability of the IR Fixed Point -- Cardiorespiratory System under Delta Covid Variant Disease -- Rare Attractors and Chaos in Buck Converter Under Peak-Current Mode Control -- Analysis of the Influence of Boundary Conditions in Kinetic Problems -- Complexity and Chaos Control of a Bertrand Duopoly Game with Bounded Rational and Imitative Expectations -- On the Dynamics of a Heterogeneous Duopoly Game Participating in Nitrogen Emission Reduction -- Symmetry and Generalized Intermittency in the Lorenz Model -- Examples of Applications of an Invariant Statistical Theory of Field to Cosmology, Astrophysics Hydrodynamics, Electrodynamics, and Photonics -- "Order" and "Chaos" in the Evolution of Matter -- Fisher Information Perspective of Pauli's Electron -- Formal Setting for Period Doubling Bifurcation of Limit Cycles.

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#### Sommario/riassunto

This proceedings of 15th CHAOS2022 International Conference highlights recent developments in nonlinear, dynamical, and complex systems. The conference was intended to provide an essential forum for Scientists and Engineers to exchange ideas, methods, and techniques in the field of Nonlinear Dynamics, Chaos, Fractals and their applications in General Science and Engineering Sciences. The principal aim of CHAOS2022 International Conference is to expand the development of the theories of the applied nonlinear field, the methods, empirical data and computer techniques as well as the best theoretical achievements of chaotic theory. CHAOS2022 Conference provides a forum for bringing together the various groups working in the area of Nonlinear and Dynamical Systems, Chaotic theory and Application to exchange views and report research findings.

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