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Collana	Lecture Notes in Physics, , 0075-8450 ; ; 375
Disciplina	516.3/6
Soggetti	Mathematical physics Differential geometry Theoretical, Mathematical and Computational Physics Differential Geometry
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Nota di contenuto	Higgs fields and superconnections -- Noncommutative differential geometry, quantum mechanics and gauge theory -- to non-commutative geometry and Yang-Mills model-building -- II. Gauge-field model-building via non-commutative differential geometry -- Measuring coalgebras, quantum group-like objects, and non-commutative geometry -- Tensor Operator Structures in Quantum Unitary Groups -- Quantum groups and quantum complete integrability: Theory and experiment -- Some ideas and results on integrable nonlinear evolution systems -- An algebraic characterization of complete integrability for Hamiltonian systems -- Integrable lattice models and their scaling limits QFT and CFT -- Quantum groups, Riemann surfaces and conformal field theory -- Some physical applications of category theory -- From poisson groupoids to quantum groupoids and back -- Quantization on Kähler manifolds -- A new class of infinite-dimensional Lie algebras (continuum Lie algebras) and associated nonlinear systems -- Exchange Algebra in the Conformal Affine sl 2 Toda Field Theory -- Some properties of p-lines -- Breaking of supersymmetry through anomalies in composite spinor operators --

Conformal field theory and moduli spaces of vector bundles over variable Riemann surfaces -- Instanton homology -- W- geometry -- Connections between CFT and topology via Knot theory -- Stochastic calculus in superspace and supersymmetric Hamiltonians -- Geometric models and the moduli spaces for string theories -- Supersymmetric products of SUSY-curves ° -- Classical superspaces and related structures -- Remarks on the differential identities in Schouten-Nijenhuis algebra -- Generic irreducible representations of classical Lie superalgebras -- Krichever construction of solutions to the super KP hierarchies -- The structure of supersymplectic supermanifolds -- Gauge fixing: Geometric and probabilistic aspects of yang-mills gauge theories -- A renormalizable theory of quantum gravity -- Third order nonlinear Hamiltonian systems: Some remarks on the the action-angle transformation -- Tensor products of  $q p = 1$  quantum groups and WZW fusion rules -- The modular group and super-KMS functionals -- New quantum representation for gravity and Yang-Mills theory -- Geometric quantization of the five-dimensional Kepler problem -- Structure functions on the usual and exotic symplectic and periplectic supermanifolds -- Symbols alias generating functionals — a supergeometric point of view -- Sheaves of graded Lie algebras over variable Riemann surfaces and a paired Weil-Petersson inner product.

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### Sommario/riassunto

Geometry, if understood properly, is still the closest link between mathematics and theoretical physics, even for quantum concepts. In this collection of outstanding survey articles the concept of non-commutation geometry and the idea of quantum groups are discussed from various points of view. Furthermore the reader will find contributions to conformal field theory and to superalgebras and supermanifolds. The book addresses both physicists and mathematicians.

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