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Nota di bibliografia	Includes bibliographical references (p. 289-303) and index.
Nota di contenuto	Brief motivations -- Spaces and superspaces -- Chirality as a kind of Grassmann analyticity -- N = 1 chiral superfields -- Auxiliary fields -- Why standard superspace is not adequate for N = 2 supersymmetry -- Search for conceivable superspaces (spaces) -- N = 2 harmonic superspace -- Dealing with the sphere S[superscript 2] -- Comparison with the standard harmonic analysis -- Why harmonic superspace helps -- N = 2 supersymmetric theories -- N = 2 matter hypermultiplet -- N = 2 Yang-Mills theory -- N = 2 supergravity -- N = 3 Yang-Mills theory -- Harmonics and twistors. Self-duality equations -- Elements of supersymmetry -- Poincare and conformal symmetries -- Poincare group -- Conformal group -- Two-component spinor notation -- Poincare and conformal superalgebras -- N = 1 Poincare superalgebra -- Extended supersymmetry -- Conformal supersymmetry -- Central charges from higher dimensions -- Representations of Poincare supersymmetry -- Representations of the Poincare group -- Poincare

superalgebra representations. Massive case -- Poincare superalgebra representations. Massless case -- Representations with central charge -- Realizations of supersymmetry on fields. Auxiliary fields -- N = 1 matter multiplet -- N = 1 gauge multiplet -- Auxiliary fields and extended supersymmetry -- Superspace -- Coset space generalities -- Coset spaces for the Poincare and super Poincare groups -- N = 2 harmonic superspace -- Harmonic variables -- Harmonic covariant derivatives -- N = 2 superspace with central charge coordinates.

Sommario/riassunto

This is a pedagogical introduction to the harmonic superspace method in extended supersymmetry. Inspired by exciting developments in superstring theory, it provides a systematic treatment of the quantum field theories with N=2 and N=3 supersymmetry in harmonic superspace. The authors present the harmonic superspace approach as a means of providing an off-shell description of the N=2 supersymmetric theories, both at the classical and quantum levels. Furthermore, they show how it offers a unique way to construct an off-shell formulation of a theory with higher supersymmetry, namely the N=3 supersymmetric Yang-Mills theory. Harmonic Superspace makes manifest many remarkable geometric properties of the N=2 theories, for example, the one-to-one correspondence between N=2 supersymmetric matter, and hyper-Kahler and quaternionic manifolds. This book will be of interest to researchers and graduate students working in the areas of supersymmetric quantum field theory, string theory and complex geometries.