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Descrizione fisica	1 online resource (xiv, 306 pages) : digital, PDF file(s)
Collana	Cambridge monographs on mathematical physics
Altri autori (Persone)	GalperinA. S <1954-> (Alexander Samoilovich)
Disciplina	539.7/25
Soggetti	Supersymmetry
Lingua di pubblicazione	Inglese
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Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
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^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.
