

# Preface

Supersymmetry was discovered by physicists in the 1970s. The mathematical treatment of it began much later and grew out of the works notably of Berezin, Kostant, Leites, Manin, Bernstein, Freed, Deligne, Morgan, Varadarajan and others. These works are all in what one may call the differential category and contain many additional references to the subject.

This monograph has grown out of the desire to present a moderately brief and focussed account of the mathematical foundations of supersymmetry both in the differential and algebraic categories. Our view is that supergeometry and super Lie theory are beautiful areas and deserve much attention.

Our intention was not to write an encyclopedic treatment of supersymmetry but to supply only the foundational material that will allow the reader to penetrate the more advanced papers in the wide literature on this subject. For this reason we do not treat the differential and symplectic supergeometry and we are unable to give a comprehensive treatment of the representation theory of Lie supergroups and Lie superalgebras, which can be found in more advanced papers by Kac, Serganova, Penkov, Duflo, Cassinelli et al. and so on.

Our work is primarily directed to second or third year graduate students who have taken a one year graduate course in algebra and a beginning course in Lie groups and Lie algebras. We have provided a discussion without proofs of the classical theory, which will serve as a departure point for our supergeometric treatment. Our book can very well be used as a one-semester course or a participating seminar on supersymmetry, directed to second and third year graduate students.

The language used in this monograph is that of the functor of points. Since this language is not always familiar even to second-year graduate students we have attempted to explain it even at the level of classical geometry. Apart from being the most natural medium for understanding supergeometry, it is also, remarkably enough, the language closest to the physicists' method of working with supersymmetry.

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