

Preface

The magnetic properties of nanoparticles have long been an object of study, but there remains an irritating diversity of phenomena that await full comprehension. The main implication of magnetic nanoparticles is the uniformity in the magnetic properties of individual particles in real dispersion systems, which makes it possible to directly correlate the magnetic properties of a whole material with those of each individual particle.

One of the main aims in preparing this book was to highlight the complex magnetic behavior of magnetic nanosystems composed of a core-shell, heterodimer, dumbbell geometries, and so on and their utility for application purposes. This book does not provide a comprehensive review of the many studies concerned with complex magnetic nanoparticles; instead, we concentrate our attention on presenting an expansive synopsis, furnishing key examples, and trying to motivate a deeper than usual examination of cutting-edge fundamental developments in the field. This will likely distinguish the book from other works in the literature.

The book will provide a forum for critical evaluations of many aspects of complex magnetism that are at the forefront of nanoscience today. The chapters do not cover the entire range of issues associated with nanomagnetism, which would be infinite, but rather present highlights, especially in the domains of interest to the authors and editor, while keeping an eye on the most up-to-date research in the field. I hope that the book, which will probably emerge as the primary text dealing with the general aspects of complex magnetic nanoparticles, will prove useful for all the various people interested in nanomagnetism: from beginning- and graduate-level students up to advanced specialists in both academic and industrial settings. The first few chapters allow the book to be used as a first text on research in this area and therefore will benefit readers coming to the subject from diverse perspectives.

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