

Foreword

Nanoscience, a critical frontier field in science and technology in the 21st century, has long had an impact on economic and social development and thus has been a focus of global attention. It is a highly interdisciplinary field with applications across a wide range of sectors, from aviation to clinical solutions to the energy industry. With its numerous applications and interdisciplinary nature, understanding how research in the field of nanotechnology has evolved in recent years is essential to successfully solving the modern strategic and societal challenges faced by all nations.

Over the past 2 decades, the field of nanoscience has become increasingly accelerated, in part owing to improved collaboration across disciplines through the launch of dedicated programs, research centers, and other government initiatives around the world. In the United States, the National Nanotechnology Initiative was founded in 2000 to coordinate nano-related research and resources across 20 different federal departments. More recently, China's 14th Five-Year Plan outlines the importance of frontier areas in science and technology while acting on innovation-driven development strategies. Thus, it is unsurprising to find high-end smart materials such as shape memory alloys, self-healing materials, and nano-functional materials such as graphene and metamaterials among the 100 major projects of the 14th Five-Year Plan. The plan also identifies frontier nano-research as one of the National Key Research and Development Objectives to advance scientific exploration at the nanometer scale. As the importance of nanoscience is increasingly recognized, I believe more and more dedicated research organizations around the world will arise to nourish its growth.

Of course, much progress has already been made in nanoscience that needs to be celebrated. As this in-depth and comprehensive analytical book reveals, the subject has seen enormous growth in research output, with varied industry partners across many different sectors between 2000 and 2019. In fact, nano-related research has risen from only 1.1% of all global research in 2000 to an impressive 6.2% by 2019. Such progress merits highlighting in an accessible manner, for both experts and nonscientists alike, to demonstrate better

the fundamental role of nanoscience in technology and everyday quality of life.

Looking forward, future progress will undoubtedly rely on strengthening basic research in the field, coupled with an enhanced awareness and improved utility of the partnerships across industries that drive research. It is also critical to plan for best practices to transform those basic research results into applied technological products. This is one of the most relevant strategic goals in terms of the development of nanotechnology in China, as well as globally.

Nanoscience and Nanotechnology in a Global Landscape aims to further an understanding of the development of nanoscience from five perspectives based on bibliometric analysis. It reviews the development of nano research over the past 20 years, revealing the impact of nanoscience on other research fields and clarifying the development of nano research from basic research to industry applications. It also summarizes key countries' nano research development strategy based on funding analysis and research focus analysis and anticipates upcoming frontier research in the nano field.

The book in its entirety provides an overall explanation of the current status and future development of nanoscience from a macro perspective, and provides extremely valuable data support and factual references for the realization of scientific and technological policy as well as major breakthroughs in the field of nanoscience.

It is my sincere hope that the field of nanoscience will advance with each passing day, and that the nano industry will continuously find new and ambitious ways to benefit our society. I believe that if we continue to watch the field's rapid pace of evolution closely, we will not be disappointed.

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