Preface

Materials science is crucial in shaping future technologies across sectors such as aerospace, electronics, energy, etc. The presented special edition is a focused selection of research results highlighting recent progress in creating and applying high-performance materials.

The first chapter explores the properties and applications of advanced structural composites and polymers, emphasising their mechanical behaviour, processing techniques, and utility in high-stress environments. These materials are central to strategies of multifunctional component design in modern engineering.

The second chapter is dedicated to analysing the magnetic and electronic characteristics of advanced functional materials. It presents the principles and methods for investigating phenomena critical to sensor technologies, memory devices, etc. This chapter also highlights the structure-property relationships.

The third chapter examines materials for energy storage technologies and devices, such as batteries and supercapacitors, that are vital for developing renewable energy, mechatronics, etc.

This special edition is designed for researchers, graduate students, and professionals in materials science and machine building.