

# Preface

This special edition presents a collection of contemporary research and technological developments across several key areas of materials science and engineering. The four chapters of this edition highlight both fundamental studies and innovative approaches that drive modern advancements in composites, metallic materials, catalysis for environmental engineering, and particle system behaviour.

Chapter 1: Composites focuses on the design, fabrication, and performance analysis of composite materials. The articles emphasise multifunctional properties and advanced processing methods that expand the application potential of composite systems in engineering.

Chapter 2: Innovative Approaches in Alloy Design and Processing explores new trends in the development and manufacturing of metallic materials. Topics include microstructure analysis and methods that enhance mechanical durability, sustainability, and performance in industrial applications.

Chapter 3: Catalysts for Pollution Removal presents studies on catalytic materials and processes designed to mitigate environmental pollution. Emphasis is placed on catalyst synthesis, reaction mechanisms, and practical applications in environmental practice.

Chapter 4: Particle System Mechanics discusses the behaviour modelling of particulate systems. The presented modelling results can be applied to the behaviour analysis of granular materials, powders, suspensions, and their mechanical interactions in the development of chemical manufacturing technologies.

The special edition can serve as a valuable resource for researchers, engineers, and students seeking to deepen their understanding of materials development, their processing strategies, and the functional application.