Preface

This special edition is dedicated to cutting-edge research and developments across diverse fields of materials science. The articles reflect the multifaceted nature of research, which bridges traditional and innovative approaches and drives progress in modern materials engineering.

The advanced characterisation techniques and processing methods that enhance the mechanical and functional properties of steels and alloys are explored in the articles of the first chapter. These insights are essential for applications ranging from construction to aerospace engineering.

The second chapter focuses on the design, synthesis, properties analysis, and application techniques of polymeric and composite materials. This chapter emphasises the role of polymers and composites in high-performance applications.

Chapter 3, Functional Materials, delves into materials with unique electrical, semiconductor, and optical properties, highlighting their transformative potential in electronics, energy, and sensing technologies.

Chapter 4, Thin Films and Membranes, examines the synthesis, characterisations, and tools for thin film characterisation and application of membranes in areas such as energy storage, water filtration, etc. These materials are pivotal in addressing challenges in energy efficiency and environmental sustainability.

The breadth of topics covered in this collection underscores the vital role of materials science in shaping our technological future. We hope that this special edition will serve as an inspiration and resource for researchers, practitioners, and students eager to advance the frontiers of this dynamic field.