Preface

The evolution of manufacturing technologies has been a cornerstone of industrial progress, shaping how societies build, innovate, and sustain themselves. Among the array of technological advancements, Friction Stir Welding (FSW) stands out as a transformative innovation in material joining processes. Since its inception, FSW has garnered attention for its ability to produce defect-free, high-strength joints in materials traditionally considered challenging to weld. This monograph seeks to provide a comprehensive exploration of FSW, delving into its principles, applications, and emerging trends, aiming to serve as a valuable resource for both researchers and practitioners in the field. This work emerges from a commitment to advancing the understanding of solid-state welding techniques and their role in fostering sustainable manufacturing practices. Drawing from an extensive body of research and practical case studies, the monograph endeavors to present a balanced view of the theoretical foundations and real-world applications of FSW. It is hoped that the insights offered will contribute to the development of innovative solutions in material joining and inspire further exploration in this dynamic domain.