

## Preface

This book synthesizes a decade of research exploring the profound connections between cosmic phenomena and Earth's geological evolution. The collected studies reveal how our planet's history—from mass extinctions and climate shifts to magmatic episodes and resource formation—is intricately linked to the Solar System's periodic passage through the Milky Way's spiral arms. The work challenges conventional Earth-centric models by demonstrating that galactic cycles, supernova events, and cosmic material deposition have fundamentally shaped Phanerozoic geology. Through interdisciplinary analysis combining astrophysics, geochemistry, paleoclimatology, and basin analysis, we develop a unified framework showing how cosmic forces synchronize with terrestrial processes across multiple timescales. The implications extend beyond academic interest, offering new perspectives on resource exploration, climate prediction, and understanding Earth's future trajectory within the galactic environment. This synthesis represents both a culmination of existing research and a foundation for future investigations into cosmic-terrestrial connections.