

In Earth evolution, mountain belts are the loci of crustal growth, reworking and recycling. These crustal-scale processes are unravelled through microscale investigations of textures and mineral assemblages of metamorphic rocks. Multiple episodes of metamorphism, re-equilibration and deformation, however, generally produce a complex and tightly interwoven pattern of microstructures and assemblages. Over the last two decades, the combination of advanced computing and technological capabilities with new concepts has provided a vast array of novel petrological tools and high-resolution/high-sensitivity techniques for micro-analysis and imaging. Such novel approaches are proving fundamental to untangling the enigma represented by metamorphism with an unprecedented level of detail and confidence. As a result, the first decade and a half of this century has already seen the tumultuous development of new research avenues in metamorphic petrology. This book aims to provide a timely overview of the state of the art of this field, of newly developed petrological techniques, future advancements and significant new case studies.