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Sommario/riassunto	<p>The papers collected in this special issue clearly reflect the modern research trends in materials science. These fields of specific attention are high-Mn TWIP steels, high-Cr heat resistant steels, aluminum alloys, ultrafine grained materials including those developed by severe plastic deformation, and high-entropy alloys. The major portion of the collected papers is focused on the mechanisms of microstructure evolution and the mechanical properties of metallic materials subjected to various thermo-mechanical, deformation or heat treatments. Another large portion of the studies is aimed on the elaboration of alloying design of advanced steels and alloys. The changes in phase content, transformation and particle precipitation and their effect on the properties are also broadly presented in this collection, including the microstructure/property changes caused by irradiation.</p>