Half-metals and spin-gapless semiconductors are a specific class of materials that have novel spin-dependent electronic properties, owing to their unique electronic structure. The band structure of these materials only has an energy gap for a particular spin-orientation, meaning the band gap disappears in the opposite spin-orientation direction. This phenomenon leads to high carrier-spin-polarization and promising spin-controlled electronic and magnetic properties for spintronics applications.

Finding novel materials with these properties has been of high importance in recent years, in order to develop new technologies involving spintronics. Most of these materials are Heusler alloys with specific crystal ordering, which is important for the electronic and magnetic properties unique to this class of materials, and hence research into these alloys or materials with these physical properties is key.

The aim of this special issue is to collate original research and review articles focused on both theoretical and experimental work in the area of half-metallic or spin-gapless materials. This includes any prediction of such materials, evidence of the electronic and magnetic properties, study of spin-polarizations, and even possible viable alternatives. The potential findings by the authors should not be limited to only Heusler alloys, but any kind of natural or artificial structures which show these properties.

Potential topics include but are not limited to the following:

- Half-metallic materials
- Heusler alloys with half-metallic, narrow bandgap, or spin-gapless band structures
- Slater-Pauling materials
- High spin-polarization materials
- Magnetism of Heusler alloys
- Structural changes in Heusler alloys differences in synthesis techniques
- Half-metallic nanoparticles
- Bulk and nanoscale properties with evidence of high spin-polarization
- Spintronic application of half-metals or spin-gapless semiconductors
- Theoretical prediction of this class of materials

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Papers are published upon acceptance, regardless of the Special Issue publication date.