This Special Issue is aimed at addressing the typical problems of fracture mechanics that can be solved by using symmetry considerations involving each kind of material.

Thus this Special Issue collected papers discussing analytical solutions to describe the stress state in the crack region and new formulations to study problems where the propagation pattern is non-linear.

Moreover, the most recent discoveries in fracture mechanics and data processing show the role of experimental techniques in validating theoretical models and helping the damage tolerance design and the definition of models for the residual life assessment of material and components within the framework of structural health monitoring.

This Special Issue collected also papers describing:

- Several examples of the extensive upgrade program on some of the experiments in fracture mechanics on innovative and engineering materials with a particular focus on their expected performance and the benefits for scientific research;

- The use of experimental techniques to validate analytical models to study the fracture mechanics behavior of materials and components.