

Special Geometries and Physics Special Session B14

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The list of special geometries includes Calabi-Yau manifolds, Quaternionic-Kähler manifolds, Hyper-Kähler manifolds, G2-manifolds and Spin(7)-manifolds. These geometries are studied both for their mathematical sake, and because they provide the mathematical formalism for new developments in Physics. In particular, String theory and M-theory are two of the most influential physical theories in this field: they provide not just motivation and urgency for special geometries and geometries with torsion, but also fundamental insight and conjectures. It is a fair statement that most of recent research on manifolds with special holonomy, such as Calabi-Yau manifolds and G2 manifolds, can be largely attributed to interactions with theoretical Physics. The same is true for certain systems of PDE, such as the Hull-Strominger system.

This special session will bring together a diverse group of geometers working with special structures on manifolds and physicists working in String and M-theory, with the aim of discussing new results and research directions in both fields. The list of speakers includes experts in a variety of very active research areas: Calabi-Yau and G2 geometry, mirror symmetry, generalized geometry, geometric flows and gauge theory.