Exceptional Complex Structures and K-stability

I will introduce a new geometric object called the Exceptional Complex Structure (ECS). This is an extension of the notion of complex structure to include all of the degrees of freedom of string backgrounds, much like the Generalised Complex Structure of Hitchin and Gualtieri was an extension that naturally included the B-field. In the first half of the talk I will define the ECS and provide some classification results, showing that they provide a unified framework to describe many supersymmetric geometries in various dimensions including complex structures, G_2, and their flux deformed counterparts. In the second half of my talk, I will discuss an intriguing observation that one may be able to use the ECS to extend the notions of K-stability to any supersymmetric background, possibly providing new tools to define and study G2 stability.

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