Birational Geometry of Elliptic Fibrations and Combinatorics of the Intrigilator-Morrison-Seiberg Potential

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Elliptic fibrations over a normal base endowed with a rational section are birational to Weierstrass models. A given singular Weierstrass model can have numerous resolutions connected to each other by flop transitions. The structure of these flops are the subjects of several conjectures relying on ideas from supersymmetric gauge theories and string theory. These conjectures are often formulated in the language of representation theory and might hint to properties of elliptic fibrations much larger than their typical applications in string theory. I will explain these ideas and review some of the recent developments, some of which, are the results of discussions and collaborations that started in a previous CAARMS conference.

Biography

Jonathan Mboyo Esole was born in Kinshada (Democratic Republic of Congo). He is a Benjamin Peirce Fellow in the Department of Mathematics at Harvard University and a member of the Harvard University Center for the Fundamental Law of Nature. He is interested in the interface of mathematics and physcis, espcially in the study of the geometric and arithmetic aspects of string theory.