

CALABI-YAU MANIFOLDS, MIRRORS, AND MODULI

Speaker: Charles Doran (Alberta/ICERM), November 6, 2017

Abstract: Calabi-Yau manifolds are of central importance in both algebraic and differential geometry, and have a range of key applications in quantum field theory and string theory. Nevertheless, in dimensions three and higher our knowledge of their construction and effective moduli has historically been tied to the ambient spaces in which they live. Hodge-theoretic considerations suggest that a more natural way to build Calabi-Yau manifolds is “from the inside out” via internal fibrations. We will discuss a first-ever classification of such Calabi-Yau threefolds and implications for the structure of their moduli spaces. Furthermore, by identifying mirror partners, we are led to a new mirror symmetry conjecture which unifies the Calabi-Yau and Fano/Landau-Ginzburg mirror proposals (and answers a question of A. Tyurin).