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Mirror symmetry and generalized Borcea-Voisin threefolds

C. Borcea and C. Voisin constructed examples of Calabi-Yau threefolds from elliptic curves and K3 surfaces with involutions, and were able to show a mirror symmetry relationship in the threefolds coming from the mirrors of the elliptic curve and the K3 surface.

We will discuss attempts to generalize this construction, and examples, using automorphisms of any possible order instead of involutions for threefolds, as well as higher dimensional constructions, with mirror symmetry in mind. In some cases we are successful, in others, no mirror symmetry exists.