Brauer groups of K3 surfaces and moduli of special cubic fourfolds.

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In 2007 Gritsenko, Hulek, and Sankaran showed that the coarse moduli space K_d of K3 surfaces of degree d is of general type as soon as d is at least 124. They did this by constructing enough pluricanonical forms out of a single special modular form for a group associated to the space K_d, by leveraging work of Borcherds. In this talk I will explain how one can use these ideas to show that certain moduli spaces parametrizing cubic fourfolds that contain more surfaces than one might expect are also of general type (joint with Sho Tanimoto). I will explain connections of this result to the arithmetic of K3 surfaces over number fields.