NEW EXAMPLES OF COMPACT HOLOMORPHIC SYMPLECTIC MANIFOLDS

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A holomorphic symplectic manifold is a complex manifold X together with a closed, non-degenerate holomorphic 2-form Ω. The top power of Ω gives a trivialisation of the canonical bundle so that X has trivial first Chern class. In the context of K\"ahler geometry, such manifolds play a very important role due to the Bogomolov covering theorem, which states that any compact K\"ahler manifold with vanishing first Chern class has a covering that splits as the product of Calabi–Yau manifolds, complex tori and irreducible holomorphic symplectic manifolds. Among these, the last two are, in fact, compact holomorphic symplectic manifolds. Furthermore, irreducible holomorphic symplectic manifolds correspond to compact hyperkahler manifolds in the K\"ahler setting. In general, finding compact holomorphic symplectic manifolds is very difficult. In this talk, I will present new examples of compact holomorphic symplectic manifolds. These manifolds correspond to moduli spaces of sheaves on Kodaira surfaces and are non-K\"ahler. This is work in progress with Tom Baird and Eric Boulter.