Selected Topics in Complex Geometry

Sheet 08

Exercise 1. Let $f : X \to Y$ be a surjective holomorphic map of compact Kähler manifolds. Show that $f^* : H(Y; \mathbb{C}) \to H(X; \mathbb{C})$ is an injective map.

Exercise 2. Let X be a compact complex manifold and $\mathcal{V}$ be a holomorphic vector bundle. Show that $\mathbb{P}(\mathcal{V})$ is a compact Kähler manifold.

Exercise 3. Let $\mathcal{V} \to X$ be a holomorphic vector bundle over a complex manifold. Derive a formula for the canonical line bundle of $\mathbb{P}(\mathcal{V})$ in terms of $\det(\mathcal{V})$, K_X and $\mathcal{O}_{\mathbb{P}(\mathcal{V})}(1)$. (Use a relative version of the Euler sequence.)

Hand-in: Via Email or in person to Jonas Stelzig until We, 15.06., 14:00.