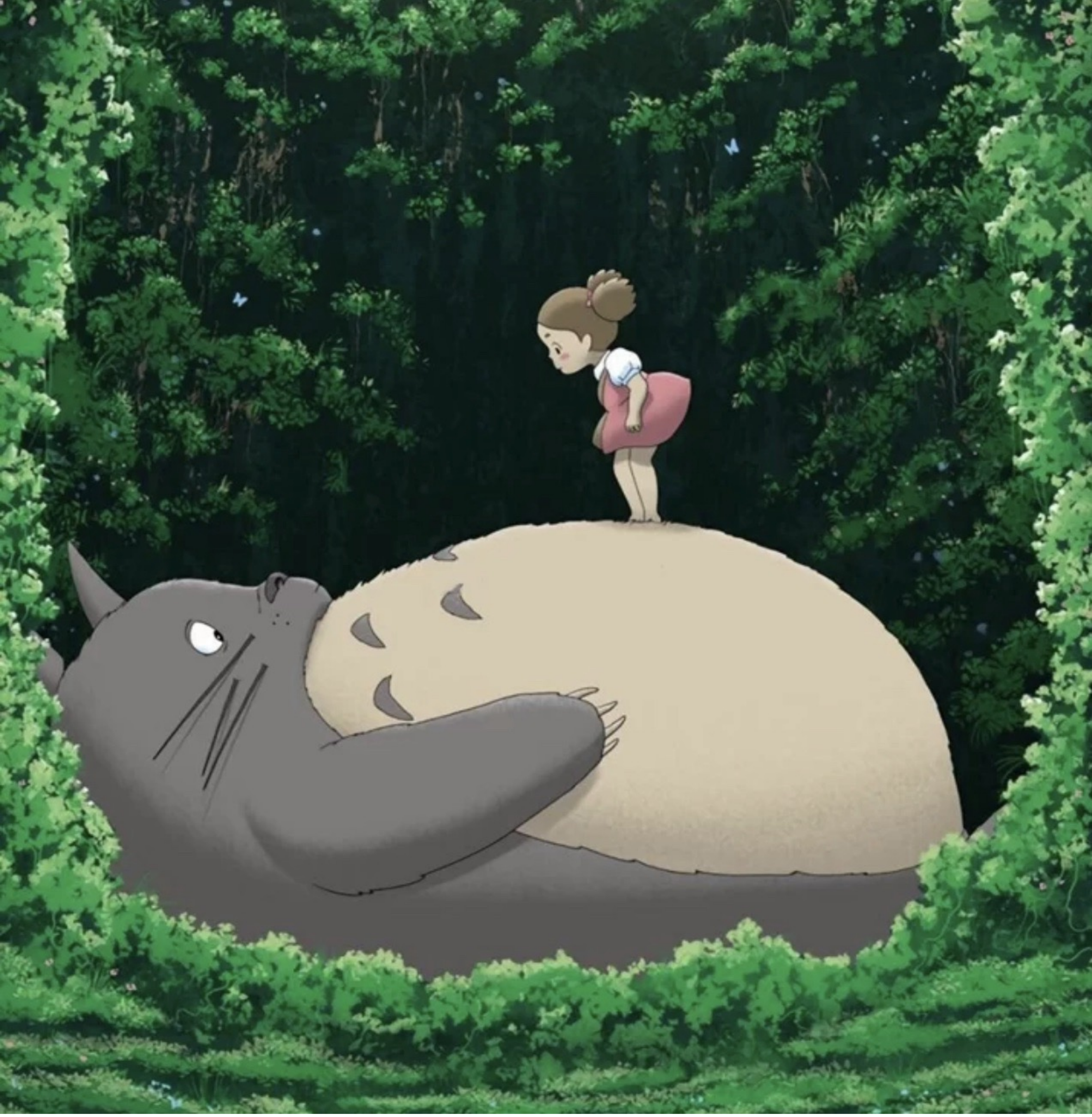

Several Complex Variables

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We will start now.

Chapter 1 Lecture 1

1.1 Course Overview

We start with the goal. Let M be a compact complex manifold. And we consider $(L, h) \to M$, positive hermitian line bundle. **Remark** The positive is used in studying subharmoniciity

Holomorphic sections of powers of L, note there is no holomorphic functions on the compact manifolds except for constants, hence we consider Holomorphic sections of powers of L, denoted by $H^0(M, L^{\bigotimes k})$

we note that $H^0(M, L^{\bigotimes k})$ is a hilbert space, and $S_0^k, ..., S_{d_k}^k$ is a basis of H^0. Bergman of f^n, we have

$$B_k(z) = \sum_{j=0}^{d_k} |S_j^k(z)|_h^2 \tag{1.1}$$

Main result, we have

$$B_k(z) = z_0 k^n + a_1 k^{n-1} + ...$$

If we define a function from the manifold to the projective space, $\phi_k = M \to \mathbb{C}P^{d_k}$, we will introduce Kodaida's embedding, if $k >> 1$, then ϕ_k is an embedding.

1.2 Math