"A problem of Kolmogorov on the ϵ-entropy".

In 1956, Kolmogorov found that the order of the ϵ-entropy H_ϵ of a set of analytic functions of n variables is given by $(\log(1/\epsilon))^{n+1}$. A precise version of this problem has been formulated in 1985, namely

$$\lim_{\epsilon\to 0} \frac{H_\epsilon(\mathcal{A}_K^D)}{\log_2^{n+1}(1/\epsilon)} = \frac{C(K,D)}{(2\pi)^n},$$

where D is a domain in $\mathbb{C}^n$ containing a compact subset K, $C(K,D)$ is a capacity, and $\mathcal{A}_K^D$ is the compact set of analytic functions f in D satisfying $||f||_D \leq 1$ topologized by the sup norm $||f||_K$. This problem has been solved in 2004 using methods from pluripotential theory and functional analysis. Today, with O. Bandtlow, we approach this problem using asymptotic estimates of Bergman kernels.