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### **Optimal approximation of smooth functions on high-dimensional domains**

This talk is a survey on recent results on approximation of functions of finite and infinite smoothness on the  $d$ -dimensional torus, where the error is measured either in the  $L_2$ -norm or in the sup-norm. The framework are quite general function spaces, including periodic Sobolev and Gevrey spaces as special cases. In particular I will present optimal asymptotic estimates for approximation numbers, with special emphasis on the  $d$ -dependence of the 'hidden' constants, and preasymptotic estimates, which are essential for high-dimensional numerical problems, and also for questions of tractability in information-based complexity.

(Based on joint work with Fernando Cobos, Sebastian Mayer, Winfried Sickel and Tino Ullrich.)