**On Kolmogorov $n$-widths and covering of compacts (joint work with Mikhail Ostrovskii)**

For an absolutely convex compact subset $K$ of a Banach space $X$, denote by $G(K)$ the set of all bounded linear operators $T$ on $X$ satisfying the condition $K \subset TK$. It is proved that the weak closure of $G(K)$ always contains the algebra $\mathcal{A}_K$ of all operators leaving the closed linear span of $K$ invariant. The conditions under which the converse inclusion holds can be formulated in terms of the asymptotic of $n$-widths of $K$. The results are related to the classification of operator ranges in Hilbert spaces, to "bilinear" operator equations $XAY = B$ and to the geometry of some "quadratic bodies" in the space of operators on a Hilbert space.