1030-37-350 **Anatole Katok*** (`katok_a@math.psu.edu`), Department of Mathematics, Pennsylvania State University, University Park, PA 16802. *Measure rigidity for smooth group actions: recent results and perspectives.* Preliminary report.

In a series of recent papers joint with Boris Kalinin and Federico Rodriguez Herts in various combinations we showed that purely homotopical or dynamical conditions on an action of $\mathbb{Z}^k$ for $K \geq 2$ imply strong rigidity properties including existence of an absolutely continuous invariant measure. So far this has been establishded for maximal rank actions, i.e. for $\mathbb{Z}^{m-1}$ actions on compact k-dimensional manifolds with $k \geq 3$. After surveying those results I will discuss ongoing work for the lower rank cases, conjectures about futher differentiable and measurable properties and prospects for using various methods from measure rigidity theory for algebraic actions in the general situations. (Received August 06, 2007)