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**Michael Roeckner\*** (roeckner@mathematik.uni-bielefeld.de), Fakultät fuer Mathematik, Universität Bielefeld, Postfach 100131, 33501 Bielefeld, Germany. *Invariant measures on (finite and) infinite dimensional manifolds.*

In this talk we shall give a survey on recent progress in the study of (infinitesimally) invariant measures on infinite dimensional manifolds. Corresponding results are at the heart of  $L^p$ -analysis in infinite dimensions, since they provide the necessary appropriate reference measures. The talk will be based on a number of papers with various coauthors, namely S.Albeverio, V.I.Bogachev, Y.G.Kondratiev, N.Krylov, T.Tsykalenko, F.Y.Wang, and T.S.Zhang. Our work was very much inspired and enriched by the fundamental work on infinite dimensional analysis done by L.Gross over the last 30 years. Results to be presented will include: a new concept of weak elliptic equations for measures in infinite dimensions, conditions for existence of (infinitesimally) invariant measures in terms of Lyapunov functions, a priori estimates, uniqueness and regularity results. If time permits, applications to the following areas respectively special cases will be discussed: - stochastic partial differential equations such as stochastic Burgers and Navier-Stokes equations - Gibbs measures in statistical mechanics; in particular, new results on absolute continuity for the infinite dimensional torus and on the classical problem, whether "invariance implies Gibbsian". (Received October 04, 2000)