SMOOTH ERGODIC THEORY AND NONUNIFORMLY HYPERBOLIC DYNAMICS

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Introduction

The goal of this chapter is to describe the contemporary status of nonuniform hyperbolicity theory. We present the core notions and results of the theory as well as discuss recent developments and some open problems. We also describe essentially all known examples of nonuniformly hyperbolic systems. Following the principles of the Handbook we include informal discussions of many results and sometimes outline their proofs.

Originated in the works of Lyapunov [170] and Perron [193, 194] the nonuniform hyperbolicity theory has emerged as an independent discipline in the works of Oseledets [191] and Pesin [197]. Since then it has become one of the major parts of