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Sommario/riassunto	This volume collects the notes of the CIME course "Nonlinear PDE’s and applications" held in Cetraro (Italy) on June 23–28, 2008. It consists of four series of lectures, delivered by Stefano Bianchini (SISSA, Trieste), Eric A. Carlen (Rutgers University), Alexander Mielke (WIAS, Berlin), and Cédric Villani (Ecole Normale Superieure de Lyon). They presented a broad overview of far-reaching findings and exciting new developments concerning, in particular, optimal transport theory, nonlinear evolution equations, functional inequalities, and differential geometry. A sampling of the main topics considered here includes optimal transport, Hamilton-Jacobi equations, Riemannian geometry, and their links with sharp geometric/functional inequalities, variational methods for studying nonlinear evolution equations and their scaling properties, and the metric/energetic theory of gradient flows and of rate-independent evolution problems. The book explores the fundamental connections between all of these topics and points to new

research directions in contributions by leading experts in these fields.