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This volume contains the proceedings of the Summer Program on Nonlinear Conservation Laws and Applications held at the IMA on July 130-31, 2009. Hyperbolic conservation laws is a classical subject, which has experienced vigorous growth in recent years. The present collection provides a timely survey of the state of the art in this exciting field, and a comprehensive outlook on open problems.

Contributions of more theoretical nature cover the following topics: global existence and uniqueness theory of one-dimensional systems, multidimensional conservation laws in several space variables and approximations of their solutions, mathematical analysis of fluid motion, stability and dynamics of viscous shock waves, singular limits for viscous systems, basic principles in the modeling of turbulent mixing, transonic flows past an obstacle and a fluid dynamic approach for isometric embedding in geometry, models of nonlinear elasticity, the Monge problem, and transport equations with rough coefficients.

In addition, there are a number of papers devoted to applications. These include: models of blood flow, self-gravitating compressible fluids, granular flow, charge transport in fluids, and the modeling and control of traffic flow on networks.