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Nota di contenuto	Intro -- Preface -- Contents -- Part I The Second Boundary Value Problem of the Prescribed Affine Mean Curvature Equation and Related Linearized Monge-Ampere Equation -- Introduction -- Notation -- 1 The Affine Bernstein and Boundary Value Problems -- 1.1 The Affine Bernstein and Boundary Value Problems -- 1.1.1 Minimal Graph -- 1.1.2 Affine Maximal Graph -- 1.1.3 The Affine Bernstein Problem -- 1.1.4 Connection with the Constant Scalar Curvature Problem -- 1.1.5 The First Boundary Value Problem -- 1.1.6 The Second Boundary Value Problem of the Prescribed Affine Mean Curvature Equation -- 1.1.7 Solvability of the Second Boundary Value Problem -- 1.2 Existence of Solution to the Second Boundary Value Problem -- 1.2.1 Existence of Solution via Degree Theory and A Priori Estimates -- 1.2.2 Several Boundary Regularity Results for Monge-Ampere and Linearized Monge-Ampere Equations -- 1.3 Proof of Global $W^{4,p}$ and $C^4$ , Estimates -- 1.3.1 Test Functions -- 1.3.2 $L^1$ Bound and Lower Bound on the Hessian Determinant -- 1.3.3 Gradient Bound -- 1.3.4 Legendre

Transform and Upper Bound on Hessian Determinant -- References --  
2 The Linearized Monge-Ampere Equation -- 2.1 The Linearized Monge-Ampere Equation and Interior Regularity of Its Solution -- 2.1.1 The Linearized Monge-Ampere Equation -- 2.1.2 Linearized Monge-Ampere Equations in Contexts -- 2.1.3 Difficulties and Expected Regularity -- 2.1.4 Affine Invariance Property -- 2.1.5 Krylov-Safonov's Harnack Inequality -- 2.1.6 Harnack Inequality for the Linearized Monge-Ampere Equation -- 2.2 Interior Harnack and Holder Estimates for Linearized Monge-Ampere -- 2.2.1 Proof of Caffarelli-Gutierrez's Harnack Inequality -- 2.2.2 Proof of the Interior Holder Estimates for the Inhomogeneous Linearized Monge-Ampere Equation -- 2.3 Global Holder Estimates for the Linearized Monge-Ampere Equations.  
2.3.1 Boundary Holder Continuity for Solutions of Non-uniformly Elliptic Equations -- 2.3.2 Savin's Localization Theorem -- 2.3.3 Proof of Global Holder Estimates for the Linearized Monge-Ampere Equation -- References -- 3 The Monge-Ampere Equation -- 3.1 Maximum Principles and Sections of the Monge-Ampere Equation -- 3.1.1 Basic Definitions -- 3.1.2 Examples and Properties of the Normal Mapping and the Monge-Ampere Measure -- 3.1.3 Maximum Principles -- 3.1.4 John's Lemma -- 3.1.5 Comparison Principle and Applications -- 3.1.6 The Dirichlet Problem and Perron's Method -- 3.1.7 Sections of Convex Functions -- 3.2 Geometry of Sections of Solutions to the Monge-Ampere Equation -- 3.2.1 Compactness of Solutions to the Monge-Ampere Equation -- 3.2.2 Caffarelli's Localization Theorem -- 3.2.3 Strict Convexity and  $C^1$ , Estimates -- 3.2.4 Engulfing Property of Sections -- Appendix A: Auxiliary Lemmas -- Appendix B: A Heuristic Explanation of Trudinger-Wang's Non-smooth Example -- References -- Part II Dynamical Properties of Hamilton-Jacobi Equations via the Nonlinear Adjoint Method: Large Time Behavior and Discounted Approximation -- Introduction -- Notations -- References -- 4 Ergodic Problems for Hamilton-Jacobi Equations -- 4.1 Motivation -- 4.2 Existence of Solutions to Ergodic Problems -- References -- 5 Large Time Asymptotics of Hamilton-Jacobi Equations -- 5.1 A Brief Introduction -- 5.2 First-Order Case with Separable Hamiltonians -- 5.2.1 First Example -- 5.2.2 Second Example -- 5.3 First-Order Case with General Hamiltonians -- 5.3.1 Formal Calculation -- 5.3.2 Regularizing Process -- 5.3.3 Conservation of Energy and a Key Observation -- 5.3.4 Proof of Key Estimates -- 5.4 Degenerate Viscous Case -- 5.5 Asymptotic Profile of the First-Order Case -- 5.6 Viscous Case -- 5.7 Some Other Directions and Open Questions -- References. 6 Selection Problems in the Discounted Approximation Procedure -- 6.1 Selection Problems -- 6.1.1 Examples on Nonuniqueness of Ergodic Problems -- 6.1.2 Discounted Approximation -- 6.2 Regularizing Process -- 6.2.1 Regularizing Process and Construction of  $M$  -- 6.2.2 Stochastic Mather Measures -- 6.2.3 Key Estimates -- 6.3 Proof of Theorem 6.5 -- 6.4 Proof of the Commutation Lemma -- 6.5 Applications -- 6.5.1 Limit of  $u$  in Example 6.1 -- 6.5.2 Limit of  $u$  in Examples 6.3, 6.4 -- 6.6 Some Other Directions and Open Questions -- 6.6.1 Discounted Approximation Procedure -- 6.6.2 Vanishing Viscosity Procedure -- 6.6.3 Selection of Mather Measures -- References -- 7 Appendix of Part II -- 7.1 Motivation and Examples -- 7.1.1 Front Propagation Problems -- 7.1.2 Optimal Control Problems -- 7.1.2.1 Inviscid Cases -- 7.1.2.2 Viscous Cases -- 7.2 Definitions -- 7.3 Consistency -- 7.4 Comparison Principle and Uniqueness -- 7.5 Stability -- 7.6 Lipschitz Estimates -- 7.7 The Perron Method -- References.

regularity theory for the Monge–Ampère and linearized Monge–Ampère equations. As an application, we solve the second boundary value problem of the prescribed affine mean curvature equation, which can be viewed as a coupling of the latter two equations. Of interest in its own right, the linearized Monge–Ampère equation also has deep connections and applications in analysis, fluid mechanics and geometry, including the semi-geostrophic equations in atmospheric flows, the affine maximal surface equation in affine geometry and the problem of finding Kahler metrics of constant scalar curvature in complex geometry. Among other topics, the second part provides a thorough exposition of the large time behavior and discounted approximation of Hamilton–Jacobi equations, which have received much attention in the last two decades, and a new approach to the subject, the nonlinear adjoint method, is introduced. The appendix offers a short introduction to the theory of viscosity solutions of first-order Hamilton–Jacobi equations. .

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