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	Nota di contenuto	1. Introduction -- 2. Prelude: Finite Dimensional Systems -- Part I Algebraic Theory: Uniform Fluxes -- 3. Simplices in Affine Spaces and Their Boundaries -- 4. Uniform Fluxes in Affine Spaces -- 5. From Uniform Fluxes to Exterior Algebra -- Part II: Smooth Theory -- 6. Smooth Analysis on Manifolds: A Short Review -- 7. Interlude: Smooth Distributions of Defects -- 8. Smooth Fluxes -- 9. Frames, Body Points, and Spacetime Structure -- 10. Stresses -- 11. Smooth Electromagnetism on Manifolds -- 12. The Elasticity Problem -- 13. Symmetry and Dynamics -- Part III Non-Smooth, Global Theories -- 14. Banachable Space of Sections of Vector Bundles over Compact Manifolds -- 15. Manifolds of Sections and Embeddings -- 16. The General Framework for Global Analytic Stress Theory -- 17. Dual Spaces Corresponding to Spaces of Differentiable Sections of a Vector Bundle: Localization of Sections and Functionals -- 18. de Rham Currents -- 19. Interlude: Singular Distributions of Defects in Bodies -- 20. Vector-Valued Currents -- 21. The Representation of Forces by

Sommario/riassunto

This monograph presents the geometric foundations of continuum mechanics. An emphasis is placed on increasing the generality and elegance of the theory by scrutinizing the relationship between the physical aspects and the mathematical notions used in its formulation. The theory of uniform fluxes in affine spaces is covered first, followed by the smooth theory on differentiable manifolds, and ends with the non-smooth global theory. Because continuum mechanics provides the theoretical foundations for disciplines like fluid dynamics and stress analysis, the author's extension of the theory will enable researchers to better describe the mechanics of modern materials and biological tissues. The global approach to continuum mechanics also enables the formulation and solutions of practical optimization problems. Foundations of Geometric Continuum Mechanics will be an invaluable resource for researchers in the area, particularly mathematicians, physicists, and engineers interested in the foundational notions of continuum mechanics.