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Titolo	Innovative Numerical Approaches for Multi-Field and Multi-Scale Problems : In Honor of Michael Ortiz's 60th Birthday / / edited by Kerstin Weinberg, Anna Pandolfi
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Collana	Lecture Notes in Applied and Computational Mechanics, , 1613-7736 ; ; 81
Disciplina	620.10015118
Soggetti	Mechanics Mechanics, Applied Calculus of variations Mathematical physics Solid Mechanics Calculus of Variations and Optimal Control; Optimization Mathematical Applications in the Physical Sciences
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Robust Numerical Schemes for an Efficient Implementation of Tangent Matrices: Application to Hyperelasticity, Inelastic Standard Dissipative Materials and Thermo-Mechanics at Finite Strains -- Folding patterns in partially delaminated thin films -- Thermo-mechanical Behavior of Confined Granular Systems -- Elastomeric gels: a model and first results -- A Tensegrity Paradigm for Minimal Mass Design of Roofs and Bridges -- Universal Meshes for the Simulation of Brittle Fracture and Moving Boundary Problems -- Free energy, free entropy, and a gradient structure for Thermoplasticity -- Comparison of isotropic elasto-plastic models for the plastic metric tensor Cp = FT p Fp -- Quasi-static evolutions in brittle fracture generated by gradient flows: sharp crack and phase-field approaches -- Improving the Material-PointMethod -- Meshfree methods applied to consolidation problems in saturated Soils -- A multiscale microstructural model of permeability in fractured

Solids -- Thermal diffusion in a polymer blend.

Sommario/riassunto

This book provides readers with a detailed insight into diverse and exciting recent developments in computational solid mechanics, documenting new perspectives and horizons. The topics addressed cover a wide range of current research, from computational materials modeling, including crystal plasticity, micro-structured materials, and biomaterials, to multi-scale simulations of multi-physics phenomena. Particular emphasis is placed on pioneering discretization methods for the solution of coupled non-linear problems at different length scales. The book, written by leading experts, reflects the remarkable advances that have been made in the field over the past decade and more, largely due to the development of a sound mathematical background and efficient computational strategies. The contents build upon the 2014 IUTAM symposium celebrating the 60th birthday of Professor Michael Ortiz, to whom this book is dedicated. His work has long been recognized as pioneering and is a continuing source of inspiration for many researchers. It is hoped that by providing a "taste" of the field of computational mechanics, the book will promote its popularity among the mechanics and physics communities.