1. Record Nr. UNINA9910299672803321

Titolo	Acoustic, Electromagnetic, Neutron Emissions from Fracture and Earthquakes / / edited by Alberto Carpinteri, Giuseppe Lacidogna, Amedeo Manuello
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2015
ISBN	3-319-16955-6
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (266 p.)
Disciplina	620
Soggetti	Mechanics Mechanics, Applied Condensed matter Geophysics Theoretical and Applied Mechanics Condensed Matter Physics Geophysics/Geodesy
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Foreword -- 1 TeraHertz Phonons and Piezonuclear Reactions from Nano-scale Mechanical Instabilities -- 2 Correlation between Acoustic and Other Forms of Energy Emissions from Fracture Phenomena -- 3 Neutron Emissions and Compositional Changes at the Compression Failure of Iron-rich Natural Rocks -- 4 Frequency-Dependent Neutron Emissions During Fatigue Tests on Iron-Rich Natural Rocks -- 5 Alpha Particle Emissions from Carrara Marble Specimens Crushed in Compression and X-ray Photoelectron Spectroscopy of Correlated Nuclear Transmutations -- 6 Elemental Content Variations in Crushed Mortar Specimens Measured by Instrumental Neutron Activation Analysis (INAA) -- 7 Piezonuclear Evidences from Tensile and Compression Tests on Steel -- 8 Cold Nuclear Fusion Explained by Hydrogen Embrittlement and Piezonuclear Fissions in Metallic Electrodes - Part I: Ni-Fe and Co-Cr Electrodes -- 9 Cold Nuclear Fusion Explained by Hydrogen Embrittlement and Piezonuclear Fissions

in Metallic Electrodes - Part II: Pd and Ni Electrodes -- 10 Piezonuclear Neutron Emissions from Earthquakes and Volcanic Eruptions -- 11 Is the Shroud of Turin in Relation to the Old Jerusalem Historical Earthquake? -- 12 Evolution and Fate of Chemical Elements in the Earth’s Crust, Ocean, and Atmosphere -- 13 Chemical Evolution in the Earth’s Mantle and its Explanation based on Piezonuclear Fission Reactions -- 14 Piezonuclear Fission Reactions Triggered by Fracture and Turbulence in the Rocky and Gaseous Planets of the Solar System -- 15 Piezonuclear Fission Reactions Simulated by the Lattice Model of the Atomic Nucleous -- 16 Correlated Fracture Precursors in Rocks and Cement-based Materials under Stress -- 17 The Sacred Mountain of Varallo Renaissance Complex in Italy: Damage Analysis of Decorated Surfaces and Structural Supports.

Sommario/riassunto

This book presents the relevant consequences of recently discovered and interdisciplinary phenomena, triggered by local mechanical instabilities. In particular, it looks at emissions from nano-scale mechanical instabilities such as fracture, turbulence, buckling and cavitation, focussing on vibrations at the TeraHertz frequency and Piezonuclear reactions. Future applications for this work could include earthquake precursors, climate change, energy production, and cellular biology. A series of fracture experiments on natural rocks demonstrates that the TeraHertz vibrations are able to induce fission reactions on medium weight elements accompanied by neutron emissions. The same phenomenon appears to have occurred in several different situations, particularly in the chemical evolution of the Earth and Solar System, through seismicity (rocky planets) and storms (gaseous planets). As the authors explore, these phenomena can also explain puzzles related to the history of our planet, like the ocean formation or the primordial carbon pollution, as well as scientific mysteries, like the so-called “cold nuclear fusion” or the correct radio-carbon dating of organic materials, such as the Turin Shroud. In biology, Piezonuclear reactions could explain the mechanism that governs the so-called "sodium-potassium pump" and, more in general, the metabolic processes. Scientists engaged in seismology, geophysics, geochemistry, climatology, planetology, condensed matter physics an d biology, as well as those involved in theoretical and applied mechanics, will all appreciate the innovative work presented here in a holistic way.