



# **Nonlinear Continuum Mechanics and Large Inelastic Deformations: 174 (Solid Mechanics and Its Applications)**

*Yuriy I. Dimitrienko*

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## **Nonlinear Continuum Mechanics and Large Inelastic Deformations: 174 (Solid Mechanics and Its Applications)** Yuriy I. Dimitrienko

The book provides a rigorous axiomatic approach to continuum mechanics under large deformation. In addition to the classical nonlinear continuum mechanics – kinematics, fundamental laws, the theory of functions having jump discontinuities across singular surfaces, etc. - the book presents the theory of co-rotational derivatives, dynamic deformation compatibility equations, and the principles of material indifference and symmetry, all in systematized form.

The focus of the book is a new approach to the formulation of the constitutive equations for elastic and inelastic continua under large deformation. This new approach is based on using energetic and quasi-energetic couples of stress and deformation tensors. This approach leads to a unified treatment of large, anisotropic elastic, viscoelastic, and plastic deformations.

The author analyses classical problems, including some involving nonlinear wave propagation, using different models for continua under large deformation, and shows how different models lead to different results. The analysis is accompanied by experimental data and detailed numerical results for rubber, the ground, alloys, etc.

The book will be an invaluable text for graduate students and researchers in solid mechanics, mechanical engineering, applied mathematics, physics and crystallography, as also for scientists developing advanced materials.

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