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Autore	Chaabane Nihed
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Nota di contenuto	Frontmatter -- Introduction. Advanced Manufacturing for Energy and Transportation International School -- Contents -- Chapter 1. Additive Manufacturing: Development of Sustainable Industrial Processes for Circular Economy Improvement -- 1.1 Additive Manufacturing: Essentials -- 1.2 Materials Challenges in Metal Additive Manufacturing -- 1.3 Correlation Between Process Parameters and Properties of Use: Example of Corrosion -- 1.4 Additive Manufacturing, from Powder to In Situ Nanocomposites -- 1.5 Architecture-by-Design: Focus on Ceramic AM -- 1.6 Some Aspects of Numerical Modelling for Additive Manufacturing -- 1.7 Packaged Electronic Additive Manufacturing -- Chapter 2. Nanoobjects: Synthesis, Integration and Application to Energy and Transportation -- 2.1 Synthesis of Nanoobjects -- 2.2 Integration of Nanoobjects -- 2.3 Application of Nanoobjects to Energy and Transportation -- References -- Chapter 3. Emerging Surface Engineering Processes -- 3.1 Thermal Spray – Cold Spray -- 3.2 Thermal Spray – Suspension Plasma Spraying -- 3.3 Physical Vapor Deposition: Principles, Ionized PVD and Examples of Application -- 3.4 Chemical Vapor Deposition -- 3.5 Atomic Layer Deposition -- References -- Chapter 4. New Drivers for Materials Science and Engineering -- 4.1 Material Resource Efficiency in Low Carbon Energy: Towards a More Circular Economy -- 4.2 Artificial Intelligence for Materials Science and Engineering -- 4.3 Integrative Approach for Safe Manufacturing -- Conclusion. From Innovation to Eco-innovation: A

New Challenge for R&D and the Industry in the Circular Economy

Sommario/riassunto

In the first part of this book, the author synthesizes the main results and formulas of physics–Albert Einstein's, with general relativity, gravitational waves involving elastic deformable space-time, quantum field theory, Heisenberg's principle, and Casimir's force implying that a vacuum is not nothingness. In the second part, based on these scientific facts, the author re-studies the fundamental equation of general relativity in a weak gravitational field by unifying it with the theory of elasticity. He considers the Ligo and Virgo interferometers as strain gauges. It follows from this approach that the gravitational constant G, Einstein's constant , can be expressed as a function of the physical, mechanical and elastic characteristics of space-time. He overlaps these results and in particular Young's modulus of space-time, with publications obtained by renowned scientists. By imposing to satisfy the set of universal constants G, c, , and by taking into account the vacuum data, he proposes a new quantum expression of G which is still compatible with existing serious publications. It appears that time becomes the lapse of time necessary to transmit information from one elastic sheet of space to another. Time also becomes elastic. Thus, space becomes an elastic material, with a particle size of the order of the Planck scale, a new deformable ether, therefore different from the non-existent luminiferous ether. Finally, in the third part, in appendices, the author demonstrates the fundamentals of general relativity, cosmology and the theory of elasticity