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Titolo	Dimensional Analysis and Self-Similarity Methods for Engineers and Scientists [[electronic resource] /] / by Bahman Zohuri
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Nota di contenuto	Dimensional Analysis -- Similitude Theory and Applications,- Dimensional Analysis and Intermediate Asymptotic -- Similarity Methods for Nonlinear Problems -- Similarity Methods and Dimensional Analysis in Engineering Dynamics.
Sommario/riassunto	· Provides innovative techniques for solving complex nonlinear partial differential equations, previously only available to scientists involved in classified government funded projects. · Goes beyond the traditional Pi (Buckingham) Theorem method to apply dimensional analysis to gas dynamics and thermal hydraulics problems where both laminar and turbulent fluids come into play · Includes specific examples demonstrating how dimensional analysis can shed light on applications from shock wave impact prediction to plasma

confinement. · Presents a unique approach to similarity methods by discussing Chaos, Fractals and Arcadia, in addition to the more common Self-Similarity and Fractals Techniques This ground-breaking reference provides an overview of key concepts in dimensional analysis and the scientific approach of similarity methods, including a uniquely robust discussion on self-similarity solutions of the First and Second kinds. The coverage pushes well beyond traditional applications in fluid mechanics and gas dynamics to demonstrate how powerful self-similarity can be in solving complex problems across many diverse fields, using nonlinear Partial Differential Equations (PDEs) by reducing them to Ordinary Differential Equations (ODEs) with a simple traditional analytical solution approach. Of particular interest is the book's coverage of dimensional analysis and self-similarity methods in nuclear and energy engineering from Heat Transfer and Thermal Hydraulic points of view. Numerous practical examples of dimensional analysis problems are presented throughout each chapter, with additional problems presented in each appendix, allowing readers to link the book's theoretical explanations and step-by-step mathematical solutions to practical implementations.