

Nonlinear Mechanics: A Supplement to Theoretical Mechanics of Particles and Continua (Dover Books on Physics)

By Alexander L. Fetter, John Dirk Walecka



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In their prior Dover book, *Theoretical Mechanics of Particles and Continua*, Alexander L. Fetter and John Dirk Walecka provided a lucid and self-contained account of classical mechanics, together with appropriate mathematical methods. This supplement — an update of that volume — offers a bridge to contemporary mechanics.

The original book's focus on continuum mechanics — with chapters on sound waves in fluids, surface waves on fluids, heat conduction, and viscous fluids — forms the basis for this supplement's discussion of nonlinear continuous systems. Topics include linearized stability analysis; a detailed examination of the Rayleigh-Bénard problem, from its formulation to issues of linearized theory of convective instability and expansion in Fourier modes; and the direct derivation of Lorenz equations for simple physical configuration. The first half of the original text deals with particle mechanics, and this supplement returns to the study of systems with a finite number of degrees of freedom. A concluding section presents a series of problems that reinforce the supplement's teachings.

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