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**Soliton Equations and Their
Algebro-Geometric Solutions
Volume I**

(1 + 1)-Dimensional Continuous Models

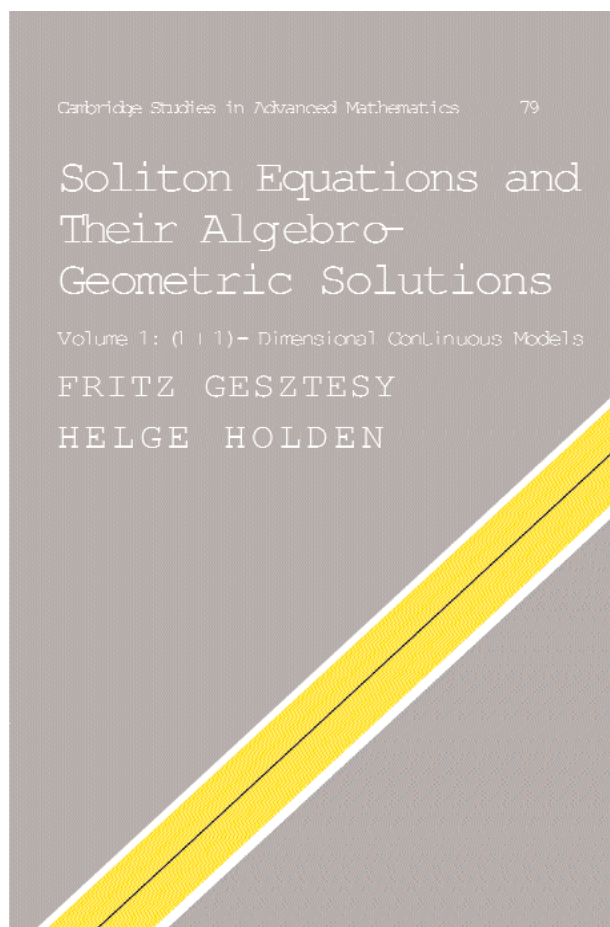
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The focus of this book is on algebro-geometric solutions of completely integrable, nonlinear, partial differential equations in (1+1)-dimensions, also known as soliton equations. Explicitly treated integrable models include the KdV, AKNS, sine-Gordon, and Camassa-Holm hierarchies as well as the classical massive Thirring system. An extensive treatment of the class of algebro-geometric solutions in the stationary as well as time-dependent contexts is provided. The formalism presented includes trace formulas, Dubrovin-type initial value problems, Baker-Akhiezer functions, and theta function representations of all relevant quantities involved. The book uses techniques from the theory of differential equations, spectral analysis, and elements of algebraic geometry (most notably, the theory of compact Riemann surfaces). The presentation is rigorous, detailed, and self-contained with ample background material. Detailed notes for each chapter together with an extensive bibliography enhance the presentation offered in the main text.

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