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Nota di contenuto	Introduction -- Motivating examples -- A coordinate-independent setup for GSPT -- Loss of normal hyperbolicity -- Relaxation oscillations in the general setting -- Pseudo singularities & canards -- What we did not discuss.
Sommario/riassunto	This volume provides a comprehensive review of multiple-scale dynamical systems. Mathematical models of such multiple-scale systems are considered singular perturbation problems, and this volume focuses on the geometric approach known as Geometric Singular Perturbation Theory (GSPT). It is the first of its kind that introduces the GSPT in a coordinate-independent manner. This is motivated by specific examples of biochemical reaction networks, electronic circuit and mechanic oscillator models and advection-reaction-diffusion models, all with an inherent non-uniform scale splitting, which identifies these examples as singular perturbation

problems beyond the standard form. The contents cover a general framework for this GSPT beyond the standard form including canard theory, concrete applications, and instructive qualitative models. It contains many illustrations and key pointers to the existing literature. The target audience are senior undergraduates, graduate students and researchers interested in using the GSPT toolbox in nonlinear science, either from a theoretical or an application point of view. Martin Wechselberger is Professor at the School of Mathematics & Statistics, University of Sydney, Australia. He received the J.D. Crawford Prize in 2017 by the Society for Industrial and Applied Mathematics (SIAM) for achievements in the field of dynamical systems with multiple time-scales.