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Selected Topics in Nonlinear Wave Phenomena: Diffusive Solitons, Singular Surfaces, and Wave Chaos[1] PEDRO JORDAN, U.S. Naval Research Laboratory, ASHOK PURI, Dept. of Physics, University of New Orleans — We explore some recent topics of interest in the field of nonlinear wave phenomena. We do so in the context of problems arising in acoustic/second-sound (e.g., thermal waves) propagation in certain nonlinear media; reaction-diffusion theory, e.g., population and chemical dynamics; and systems described by equations of the nonlinear Klein–Gordon type (e.g., the sine–Gordon equation). We investigate the corresponding governing equations with an emphasis on shock, solitary/traveling, and chaotic wave phenomena. Employing both analytical and numerical techniques, this study is carried out with the purpose of gaining a better understanding of the physical systems represented in the mathematical models. Finally, other applications of this research are noted and discussed, time permitting.

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