

Alinhac, S.: *Hyperbolic Partial Differential Equations*. (Universitext). XI, 150 pp. Springer, Dordrecht Heidelberg London New York, 2009. Euro 54,95.

This is a concise introduction to the main aspects of the theory of hyperbolic partial differential equations. It is the explicit aim of the author to keep the prerequisites to minimum (in particular, no knowledge of functional analysis is required). Nonetheless, he demonstrates that all the main features of hyperbolic equations can be understood at this level: well posedness, finite propagation speed, energy methods, etc. The first part of the book treats those parts of the theory that are based on the method of characteristics (Cauchy problem, differential operators or systems in the plane, quasilinear scalar equations and eikonal equations). Part 2 is concerned with the wave equation in space dimensions two and three. Here, particular emphasis is laid on modern methods (e.g., Lorentz fields and the Klainerman inequality, conformal energy inequalities, Morawetz and KSS inequalities). This work is highly recommended for a quick and smooth entry into this field of great current interest.

M. KUNZINGER, WIEN

Kannappan, Pl.: *Functional Equations and Inequalities with Applications*. (Springer Monographs in Mathematics). XXIII, 810 pp. Springer, Dordrecht Heidelberg London New York, 2009. Euro 142,95.

This is an encyclopaedic treatment of functional equations and inequalities by one of the leading experts in the field. The book covers a broad range of topics, from classical (Cauchy and trigonometric equations) to more specialized topics like functional equations from information theory or characterizations of groups, loops and closure conditions. The book will be of interest not only to mathematicians but also to scientists and engineers interested in certain aspects of the field. It also contains a very substantial list of references with more than 800 entries.

M. KUNZINGER, WIEN

Duistermaat, J.J., Kolk, J.A.C.: *Distributions—Theory and Applications*. XVI, 445 pp. Birkhäuser Verlag, New York, 2010. 65,95 EUR.

This is a wonderful graduate level book providing a modern introduction to distribution theory with several entrance points for deeper tours into advanced analysis and applications. The lucid discussions of the development of certain key notions and the fine careful proofs define it as a valuable text book for a corresponding university course. Moreover, it is a perfect teaser into many aspects of applications to partial differential equations and Fourier analysis. Nontrivial inspiring examples can be found throughout the text and, in addition, the authors offer an impressive arsenal of well chosen problems (including quite a number of detailed solutions). Hence even in independent self-study the reader has a fair chance to obtain a reasonable amount of working knowledge and not only a solid preparation for high-level applications in physics and engineering, but also a basis to approach advanced topics in pseudodifferential operator theory or microlocal analysis.

G. HÖRMANN, WIEN.