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means "time derivative on the left-hand side and a second order elliptic operator on the right-hand side," i.e., some direct generalization of the heat equation. Although the results in the book are applicable, of course, to these equations and systems, the aim of it is entirely different.

A new, algebraic definition of parabolicity was introduced by Petrovsky in 1938, which was 30 years ahead of its time. Generalizations were due to Eidelman and Solonnikov (in the 1960s) and the process goes on in our day too. It turned out that many "exotic" equations belong to the same class, and the basic questions for them can be handled in the same way. Many such equations have some physical background, and one can expect many more new applications.

For readers who have some idea about the development of the theory of the most complicated nonlinear evolution equations, the significance of the book is obvious from an another point of view too. This way begins with the "explicit" solution of the heat equation (the Poisson formula) and continues with the investigation of general (time- and space-dependent coefficients) linear equations. Basic results (of di Georgi, Moser, Nash, etc.) were obtained which made possible, for example, the study of uniformly parabolic nonlinear equations. Results in this domain constituted the foundation of the theory for more complicated models (for example, p-Laplacian, porous medium–type equations). A similar method could lead in the future to nonlinear versions of the equations the book discusses.

The book contains the "first steps" in several directions: general, variable-coefficient linear parabolic equations in the sense of Petrovsky, Eidelman, etc.; Kolmogorov-type equations (with growing coefficients); equations with quasi-homogeneous structure; fractional diffusion equations; and so on.

Since the first appearance of differential equations (Newton) the main object was to find general explicit solutions. Soon it turned out that it was not always possible (for ODEs); in the case of PDEs the situation is plainly more involved. But the original natural ideas continue to haunt us even if their realization meets serious difficulties.

To the general explicit solution of the heat equation one arrives as follows: First, one finds the fundamental solution looking for a self-similar solution and integrating the corresponding ODE; afterwards, using linearity and the conception of the integral and of the delta function, one can obtain the Poisson integral, i.e., the general explicit solution of the Cauchy problem. Because this is an integral representation, one has to be convinced of the existence of the corresponding derivatives too.

The method often used in the book (the authors call it "Levi's parametrix method") is a far-reaching improvement of the abovementioned simple train of thought. In the first chapter one can find detailed explications as well as typical examples.

The word "analytic" in the title means that the authors give full proofs, using the full arsenal of the corresponding adequate part of analysis. In this way they were able to have and use hundreds of original ideas. Those mathematicians who choose this direction as a research topic will highly estimate the book: They can build on a safe foundation, rely on a huge amount of material, and learn about literature otherwise almost inaccessible.

The last chapter concerns a really new subject: The time derivative is replaced by a fractional one, and this new diffusion equation is studied with the help of Fox's special functions.

Reading the book one gets a good idea of 50 years of activity of a significant Soviet–Ukrainian PDE school (the Eidelman school).

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Mathematica Laboratories for Mathematical Statistics: Emphasizing Simulation and Computer Intensive Methods. *By Jenny A. Baglivo.* SIAM, Philadelphia, PA, 2005. $70.00. xx+260 pp., softcover. ISBN 0-89871-566-0.

The title says only the half of it, describing, quite accurately, the contents of a CD accompanying Professor Baglivo's book. The book is more text than simply a labora-

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tory manual and, indeed, it could be used as the principal reading in an undergraduate mathematical statistics course. However, the book and laboratories are intended as support for a course or course sequence organized around a conventional text. For example, the flow of laboratory topics neatly meshes with the coverage provided by Larsen and Marx (2001), the text used for a third-year two-quarter sequence offered regularly by the statistics department at the University of Washington.

The laboratories are organized around the 15 chapters of the book. For each chapter there is a main laboratory and a number of supplementary problems. The laboratory surveys the chapter, introduces an additional set of *Mathematica* tools, and poses a series of problems to be solved by the student using those tools. The supplementary problems go into specific applications in greater depth and require the student to choose and use the appropriate tools. Baglivo's laboratories provide a total of 288 problems, so the typical instructor would likely choose among the supplementary problems, if not among the laboratories themselves.

The laboratories and supplementary problems are provided on the CD as *Mathematica* Version 5 notebooks. They may be printed out from the CD as workbooks as well. The latter are convenient for students to have at hand while interacting with *Mathematica*. Early chapter laboratories, those linked with probability concepts, center on the use of simulation to support mathematical intuition. Later laboratories develop a full range of statistical concepts and applications. And, to my joy, the final two chapters focus on bootstrapping and permutation tests. In the latter, Baglivo takes the commendable step of distinguishing between population (sampling) and randomization models of inference.

To ease the interface with *Mathematica*, Baglivo's CD provides a collection of "StatTools." Even with this help, students still face a bit of *Mathematica* learning. Providing computer support for a course always involves a tradeoff: an improved understanding of concepts and their application at the cost of time and energy spent in "learning the computer." That downside is ameliorated, of course, if the cost of computer learning can be amortized over a curriculum, rather than over a single course.

For departments committed to, or committing to, the instructional use of *Mathematica*, the adoption of these laboratories ought to be a no-brainer. Not only are the laboratories and problems wide-ranging, but these are not infrequently posed in ways that may tweak, if not challenge, how we teach certain topics. There is much to be learned here.

Where adoption would mean a one-off use of *Mathematica*, the choice is more complicated. Even so, for a two-term sequence, I should think it worth the time spent introducing students to the program.

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The Interaction of Ocean Waves and Wind. *By Peter Janssen.* Cambridge University Press, Cambridge, UK, 2004. $120.00. viii+ 300 pp., hardcover. ISBN 1-8523-3868-7.

This book deals with a challenging and fascinating subject. Sea-waves are generated by the action of the wind; in turn, the wave field exerts a marked influence on the airflow above it. Thus, we have strong two-way interaction: The momentum transfer depends on the sea-state. Janssen's book provides the first comprehensive treatment of this two-way interaction. The center-point is the energy balance equation, which describes changes in the wave spectrum due to advection, wind forcing, nonlinear interactions, and dissipation. The author has focused on the theory of the energy balance equation, on practical methods for integrating it, and on the relationship between wave forecasting and weather prediction. Inevitably, there are omissions: Analysis of the sea state, interpretation of satellite data, shallow water effects, freak waves, and tsunamis are hardly mentioned. But the result is a comprehensive treatment of the central topic, the two-way interaction between wind and waves. The book will be of great interest and benefit to ocean wave modelers and researchers, who are recommended to acquire a copy. The relatively high price may put it beyond the reach of many students.