***W. Rossmann: Lie Groups – An Introduction Through Linear Groups**, Oxford Graduate Texts in Mathematics 5, Oxford University Press, Oxford, 2002, 265 pp., GBP 35, ISBN 0-10-859683-9*
This is the paperback edition of the book that was first published in 2002. A review of the first edition was published in the EMS Newsletter, issue 48, June 2003, p. 33.

***D. H. von Seggern: CRC Standard Curves and Surfaces with Mathematica**, second edition, + CD, Chapman & Hall/CRC Applied Mathematics and Nonlinear Science Series, Chapman & Hall/CRC, Boca Raton, 2006, 556 pp., USD 79,95, ISBN 1-58488-599-8*
This is a book of mathematical pictures. It contains about 1000 illustrations of curves and surfaces of standard mathematical functions created by the computer algebra system *Mathematica*. In the introductory chapter the basic concepts concerning curves and surfaces are given. It also includes a modern classification of curves and surfaces. The structure of the following sixteen chapters is such that the formulas and/or the specific values of the parameters of the curves are on the left page while the corresponding plots are on the right page. New or reorganized sections in this edition are Green's functions, minimal surfaces, knots, links, Archimedean solids, duals of Platonic solids and stellated forms. With the exception of the introduction all the chapters are on the accompanying CD-ROM in the form of *Mathematica* notebooks. In fact, there is more material on the CD than in the book. Moreover, some omissions in the printed version are corrected in the electronic one. The reader can use the *Mathematica* notebooks to modify and play with plots of all the functions presented in the book. This book is recommended to anybody interested in the field. (jh)

***S. Sheffield: Random Surfaces**, Astérisque, no. 304, Société Mathématique de France, Paris, 2005, 175 pp., EUR 26, ISBN 978-2-85629-186-3*
Random surfaces, or random height functions, are random functions defined on Z^d or R^d and taking values (heights) in Z or R. Their distributions are determined by Gibbs potentials invariant under a lattice of translations and depending only on height differences. This is a general framework that covers many particular models considered in the literature. In this setting, a variational principle is proved, namely invariant Gibbs measures of given slope are those of minimal specific free energy. Continuous models are approximated by discrete ones with increasing resolution and a large deviation principle is proved. New results concerning the uniqueness of the Gibbs state are presented. The book concludes with a list of open problems. (jrat)

***R. J. Swift, S. A. Wirkus: A Course in Ordinary Differential Equations**, Chapman & Hall/CRC, Boca Raton, 2006, 667 pp., USD 89,95, ISBN 1-58488-476-2*
This voluminous book is intended as an elementary introduction aimed at undergraduate university students. Each section states (without proof) relevant theorems and then proceeds by means of simple examples and exercises. An important feature is that the exposition is richly accompanied by computer algebra code (equally distributed between *Matlab*, *Mathematica* and *Maple*). The major part of the book is devoted to classical linear theory (both for systems and higher order equations). The necessary material from linear algebra is also covered. More advanced topics include numerical methods (Euler, Runge-Kutta), stability of equilibria, bifurcations, Laplace transforms and the power series method. The elementary character of the book makes it accessible to a wide audience of students; it also serves as a simple introduction to the above mentioned computer programs. (dpr)

***P. Tauvel, R. W. T. Yu: Lie Algebras and Algebraic Groups**, Springer Monographs in Mathematics, Springer, Berlin, 2005, 653 pp., EUR 69,95, ISBN 3-540-24710-1*
The main topic of this comprehensive monograph is a detailed study of Lie algebras over an algebraically closed field of zero characteristic. The first ten chapters summarize basic results from commutative algebra, topology, sheaf theory, Jordan decomposition and basic facts on groups and their representations. The following seven chapters review required facts from algebraic geometry. The next part of the book (nine chapters) contains a detailed study of the relationship between algebraic groups and corresponding Lie algebras. The next two chapters contain the theory of representations of semisimple Lie algebras and the Chevalley theorem on invariants. Then the author introduces S-triples and describes properties of nilpotent orbits in semisimple Lie algebras. The final chapters are devoted to symmetric Lie algebras, semisimple symmetric Lie algebras, sheets of Lie algebras and a study of properties of the coadjoint representation. The main advantage of the book is a systematic treatment of the field, including detailed proofs. (vs)

***J. L. Vázquez: Smoothing and Decay Estimates for Nonlinear Diffusion Equations – Equations of Porous Medium Type**, Oxford Lecture Series in Mathematics and its Applications 33, Oxford University Press, Oxford, 2006, 234 pp., GBP 45, ISBN 0-19-920297-4 , ISBN 978-0-19-920297-3*
The central object of this book is the nonlinear partial differential equation, $u_t - div\ (|u|^{m-1} grad\ u)$; $x \in R^n$, $t > 0$, equipped with the initial value condition $u = u_0$; $x \in R^n$, $t = 0$. The author is concerned with the smoothing effect of the equation and the time decay of positive solutions, i.e. whether the fact that u_0 belongs to some function space X implies that the solution $u(t)$ in time $t > 0$ is a member of some "better" function space Y and if it is possible to get estimates of the form $|u(t)|_Y < C(t, X, n, m, |u_0|_X)$. Well-posedness of the problem and some other substantial results such as the comparison theorem are mentioned in the preliminary part of the book and references are given for the proofs. Smoothing is carefully studied for all $n \in N$, $m \in$ R (if $m = 1$ the classical results for the heat equation are reconstructed), X and Y being Lebesgue or weak Lebesgue spaces, which naturally appear as the correct spaces for studies of smoothing. It is very interesting that depending on m, n, X, Y, the solutions of the equation exhibit qualitatively very different properties, which are sometimes very surprising. The last chapter is devoted to the question of whether the results for the equation introduced at the beginning of the review also remain valid for the p-Laplacian equation. The book is very nicely written, well ordered and gives a rather complete overview of known results in the chosen field. At the beginning of each chapter there is a summary of the whole chapter with remarks of which sections of the chapter are essential for the following sections. The text