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Physique statistique, structure de la matière

Hervé KUNZ. — **Matrices aléatoires en physique.** — Cahiers de physique, vol. 3. — Un vol. broché, 15×21, de VIII, 84 p. — ISBN 2-88074-373-7. — Prix: SFr. 38.00. — Presses polytechniques et universitaires romandes, Lausanne, 1998.

Cet ouvrage propose une introduction à la théorie des matrices aléatoires et à ses applications en physique, notamment dans le domaine du chaos quantique. L'universalité des corrélations à courte distance pour une large classe de modèles est montrée. Les résultats sont obtenus non seulement par les méthodes classiques de Wigner, Gaudin, Mehta, Dyson, mais également par la méthode supersymétrique d'Efetov, qui est présentée de manière détaillée et soignée. Cet ouvrage s'adresse principalement aux physiciens ainsi qu'aux mathématiciens.

Economie, recherche opérationnelle, jeux

Alexander P. ABRAMOV. — **Connectedness and necessary conditions for an extremum.** — Mathematics and its applications, vol. 431. — Un vol. relié, 16,5×24,5, de XI, 199 p. — ISBN 0-7923 4910-5. — Prix: Dfl. 175.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This monograph is the first book in the study of necessary conditions of an extremum in which topological connectedness plays a major role. Many new and original results are presented here. The synthesis of the well-known Dybrovitskii-Milyutin approach, based on functional analysis, and topological methods permits the derivation of the so-called alternative conditions of an extremum. Examples from mathematical economics illustrate the alternative conditions of any extremum. Parallels are drawn between these examples and the problems of static equilibrium in classical mechanics.

Ana Isabel BARROS. — **Discrete and fractional programming techniques for location models.** — Combinational optimization, vol. 3. — Un vol. relié, 16,5×24, de XVIII, 178 p. — ISBN 0-7923-5002-2. — Prix: Dfl. 180.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book integrates two seemingly unrelated fields: location analysis and fractional programming. Location analysis deals with the problem where to locate facilities in such a way as to optimize a particular criterion taking into account the existing clients. Fractional programming is a special field of nonlinear programming dealing with optimization problems where the objective function consists of a ratio of given functions. Those interested in location theory will find not only new results in discrete location, especially in two-level location models, but also the theoretical and practical potential of fractional programming in location theory. Those in the field of fractional programming will find a clear and geometrical interpretation of the basic techniques of fractional and generalized fractional programming and new theoretical duality results that lead to efficient and innovative algorithms.

Franco GIANNESI, Sándor KOMLÓSI, Tamás RAPSÁK, (Editors). — **New trends in mathematical programming: homage to Steven Vajda.** — Applied optimization, vol. 13. — Un vol. relié, 16,5×25, de XI, 314 p. — ISBN 0-7923-5036-7. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book is dedicated to the memory of Stephan Vajda, one of the pioneers of mathematical programming, who was born in Hungary. The twenty-two invited chapters written by thirty-six authors from twelve countries provide the reader with an insight into recent advances in mathematical programming. This book is addressed to researchers and postgraduate students with an interest in the theoretical and algorithmic aspects of the field.

Mark Sh. LEVIN. — **Combinatorial engineering of decomposable systems.** — Combinatorial optimization, vol. 2. — Un vol. relié, 17×25, de xx, 371 p. — ISBN 0-7923-4950-4. — Prix: Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This book presents a morphological approach to the combinatorial design/synthesis of decomposable systems. Applications involve the following: design (e.g., information systems; user's interface; educational courses); planning (e.g., problem solving strategies; product life cycles; investment); metaheuristics for combinatorial optimization; information retrieval, etc.

Biaggio RICCERI, Stephen SIMONS, (Editors). — **Minimax theory and applications.** — Nonconvex optimization and its applications, vol. 26. — Un vol. relié, 16,5×24,5, de ix, 270 p. — ISBN 0-7923-5064-2. — Prix: Dfl. 220.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume contains the proceedings of the workshop on *Minimax Theory and Applications*, held from September 30 to October 6, 1996, in Erice, Italy. The book deals mainly with classical minimax theory, reflecting on current trends in the basic theory. In particular, the role of connectedness, which replaces that of convexity appearing in most classical results, is clearly emerging. The applications concern, among other things, game theory, integral functionals and monotone operators.

Naum Z. SHOR. — **Nondifferentiable optimization and polynomial problems.** — Nonconvex optimization and its applications, vol. 24. — Un vol. relié, 17×24,5, de xvii, 394 p. — ISBN 0-7923-4997-0. — Prix: Dfl. 330.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book is devoted to investigation of polynomial optimization problems including boolean problems which are the most important part of mathematical programming. It is shown that the methods of nondifferentiable optimization can be used for finding solutions of many classes of polynomial problems and for obtaining good dual estimates for optimal objective value in these problems.