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Kapitel: Logique et fondements

ainsi qu'à un colloque de philosophie des mathématiques organisé par ce même Institut, tous deux dirigés par Michel Serfati. Il privilégie les questions d'histoire des idées et d'épistémologie par rapport à des descriptions purement historiques, avec pour objectif de mettre en lumière certaines des facettes diverses qui concourent à organiser en mathématiques ce qu'on appelle communément depuis Descartes, la *méthode*. — *Sommaire:* M. Serfati: Le développement de la pensée mathématique du jeune Descartes. — A. Douady: Géométrie dans les espaces de paramètres. Une méthode de géométrisation. — R. Langevin: Gaspard Monge, de la planche à dessin aux lignes de courbure. — A. Revuz: Y a-t-il une méthode en mathématiques? — O. Hudry: Machines de Turing et complexité algorithmique. — I. Grattan-Guinness: La psychologie dans les fondements de la logique et des mathématiques: le cas de Boole, Cantor et Brouwer. Traduction de A. Michel-Pajus. — A. Michel: Thèses d'existence et travail mathématique. — M. Serfati: Analogies et «prolongements» (Écriture symbolique et création d'objets mathématiques, de Leibniz à L. Schwartz). — M. Bitbol: Critères d'existence et preuves d'existence. — J. Mosconi: Quelques difficultés du structuralisme mathématique.

George G. Szpiro. — **Kepler's conjecture: how some of the greatest minds in history helped solve one of the oldest math problems in the world.** — Un vol. relié, 16×24, de viii, 296 p. — ISBN 0-471-08601-0. — Prix: £18.50. — John Wiley, Hoboken, New Jersey, 2003.

Sir Walter Raleigh simply wanted to know the best and most efficient way to pack cannonballs in the hold of his ship. In 1611, German astronomer Johannes Kepler responded with the obvious answer: by piling them up the same way that grocers stack oranges or melons. For the next four centuries, Kepler's conjecture became the figurative loose cannon in the mathematical world as some of the greatest intellects in history set out to prove his theory. *Kepler's Conjecture* provides a mesmerizing account of this 400-year quest for an answer that would satisfy even the most skeptical mathematical minds.

Logique et fondements

C. Ward Henson, José Lovino, Alexander S. Kechris, Edward Odell. (Editors). — **Analysis and logic.** — London Mathematical Society lecture note series, vol. 262. — Un vol. relié, 15×23, de xiv, 267 p. — ISBN 0-521-64681-0. — Prix: £29.95. — Cambridge University Press, Cambridge, 2003.

The articles in this book had their origins in three mini-courses offered at the conference "Analyse & Logique" held August 25-29, 1997, at the University of Mons-Hainaut in Mons, Belgium. For a long time there have been rich connections between analysis and logic; these articles bear witness that this relationship is still very active, and continues to be important for both areas. Part one: Ultraproducts in analysis by C. Ward Henson and José Bovino. Part two: Actions of Polish groups and classification problems by Alexander S. Kechris. Part three: On subspaces, asymptotic structure, and distortion of Banach spaces; connections with logic by Edward Odell.

George Tourlakis. — **Lectures in logic and set theory, vol. 1: Mathematical logic, vol. 2: Set theory.** — Cambridge studies in advanced mathematics, vol. 82 et 83. — 2 volumes reliés, 16×23,5, de respectivement xi, 328 p. et xiv, 575 p. — ISBN 0-521-75373-2 (vol. 1), 0-521-75374-0 (vol. 2). — Prix: £47.50 (vol. 1) et £65.00 (vol. 2). — Cambridge University Press, Cambridge, 2003.

This two-volume work bridges the gap between introductory expositions of logic or set theory on one hand, and the research literature on the other. The volumes are written in a user-

friendly conversational lecture style. Volume 1 includes formal proof techniques, a section on applications of compactness (including non-standard analysis), a generous dose of computability and its relation to the incompleteness phenomenon, and the first presentation of a complete proof of Gödel's second incompleteness theorem since Hilbert and Bernays' *Grundlagen*. Volume 2 on formal (ZFC) set theory, incorporates a self–contained "chapter 0" on proof techniques so that it is based on formal logic, in the style of Bourbaki. The emphasis on basic techniques will provide the reader with a solid foundation in set theory and provides a context for the presentation of advanced topics such as absoluteness, relative consistency results, two expositions of Gödel's constructible universe, numerous ways of viewing recursion, and a chapter on Cohen forcing.

Théorie des ensembles

F. William LAWVERE, Robert ROSEBRUGH. — **Sets for mathematics.** — Un vol. broché, 18×25, de XI, 261 p. — ISBN 0-521-01060-8. — Prix : £ 19.95. — Cambridge University Press, Cambridge, 2003.

Advanced undergraduate or beginning graduate students need a unified foundation for their study of mathematics. For the first time in a text, this book uses categorical algebra to build such a foundation, starting from intuitive descriptions of mathematically and physically common phenomena and advancing to a precise specification of the nature of categories of sets. Set theory as the algebra of mappings is introduced and developed as a unifying basis for advanced mathematical subjects such as algebra, geometry, analysis, and combinatorics. The formal study evolves from general axioms that express universal properties of sums, products, mapping sets, and natural number recursion. The distinctive features of Cantorian abstract sets, as contrasted with the variable and cohesive sets of geometry and analysis, are made explicit and taken as special axioms. Functor categories are introduced to model the variable sets used in geometry and to illustrate the failure of the axiom of choice. An appendix provides an explicit introduction to necessary concepts from logic, and an extensive glossary provides a window to the mathematical landscape.

Analyse combinatoire

Jiří HERMAN, Jaromir ŠIMŠA, Radan KUČERA. — **Counting and configurations : problems in combinatorics, arithmetic, and geometry.** — Translated by Karl Dilcher. — CMS Books in mathematics, vol. 12. — Un vol. relié, 16×24, de X, 392 p. — ISBN 0-387-95552-6. — Prix : € 69.95. — Springer, New York, 2003.

This book presents methods of solving problems in three areas of elementary combinatorial mathematics : classical combinatorics, combinatorial arithmetic, and combinatorial geometry. In each topic, brief theoretical discussions are immediately followed by carefully worked-out examples of increasing degrees of difficulty and by exercises that range from routine to rather challenging. Although this book emphasizes some methods that are not usually covered in beginning university courses, it nevertheless teaches techniques and skills that are useful not only in the specific topics covered here. There are approximately 310 examples and 650 exercises.

L. LOVÁSZ, J. PELIKÁN, K. VESZTERGOMBI. — **Discrete mathematics : elementary and beyond.** — Undergraduate texts in mathematics. — Un vol. broché, 15,5×23,5, de IX, 290 p. — ISBN 0-387-95585-2. — Prix : € 39.95. — Springer, New York, 2003.

Discrete mathematics is quickly becoming one of the most important areas of mathematical research, with applications to cryptography, linear programming, coding theory, and the theory of