

Zeitschrift: L'Enseignement Mathématique
Herausgeber: Commission Internationale de l'Enseignement Mathématique
Band: 45 (1999)
Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Kapitel: Calcul des variations

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 19.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

concentrate on Hilbert spaces, specifically the spectral theorem for bounded as well as unbounded operators in separable Hilbert spaces. While the first two chapters are devoted to basic propositions concerning normed vector spaces and Hilbert spaces, the third chapter treats advanced topics which are perhaps not standard in a first course on functional analysis (a detour into operator algebras). The fourth chapter reverts to more standard operator theory in Hilbert space, dwelling on topics such as the spectral theorem for normal operators, the polar decomposition theorem, and the Fredholm theory for compact operators.

Calcul des variations

Andrea BRAIDES, Anneliese DEFANCESCHI. — **Homogenization of multiple integrals.** — Oxford lecture series in mathematics and its applications, vol. 12. — Un vol. relié, 16,5×24, de xiv, 298 p. — ISBN 0-19-850246-X. — Prix : £40.00. — Clarendon Press, Oxford, 1998.

Homogenization results and appropriate descriptive formulae are given for periodic and almost periodic functionals. Applications are described to the asymptotic behaviour of oscillating energies describing cellular hyperelastic materials, porous media, materials with stiff and soft inclusions, and fibred media; to homogenization of Hamilton-Jacobi equations and Riemannian metrics, and to materials with multiple scales of microstructure and with multi-dimensional structure. There is a self-contained and up-to-date introduction to the relevant results of the direct methods of Γ -convergence and of the theory of weak lower semi-continuous integral functions that depend on vector-valued functions.

Jürgen JOST, Xianqing LI-JOST. — **Calculus of variations.** — Cambridge studies in advanced mathematics, vol. 64. — Un vol. relié, 16×23,5, de xvi, 323 p. — ISBN 0-521-64203-5. — Prix : £37.50. — Cambridge University Press, Cambridge, 1999.

One-dimensional problems and classical issues like Euler-Lagrange equations are treated, as are Noether's theorem, Hamilton-Jacobi theory, and in particular geodesic lines, thereby developing some important geometric and topological aspects. The basic ideas of optimal control theory are also given. The second part of the book deals with multiple integrals. After a review of Lebesgue integration, Banach and Hilbert space theory and Sobolev spaces (with complete details and proofs), there is a treatment of the direct methods and the fundamental lower semi-continuity theorems. Subsequent chapters introduce the basic concepts of the modern calculus of variations, namely relaxation, Gamma convergence, bifurcation theory and minimax methods based on the Palais-Smale condition.

Géométrie

Jack B. KUIPERS. — **Quaternions and rotation sequences: a primer with applications to orbits, aerospace, and virtual reality.** — Un vol. relié, 20×26, de xxii, 371 p. — ISBN 0-691-05872-5. — Prix : £35.00. — Princeton University Press, Princeton, distributed by John Wiley & Sons, Chichester, 1999.

In this book, the author introduces quaternions for scientists and engineers who have not encountered them before and shows how they can be used in a variety of practical situations. The opening chapters present introductory material and establish the book's terminology and notation. The next part presents the mathematical properties of quaternions, including quaternion algebra and geometry. It includes more advanced special topics in spherical trigonometry, along with an introduction to quaternion calculus and perturbation theory. In the final section, the author discusses state-of-the-art applications.