<<后现代分析>>

图书基本信息

书名：<<后现代分析>>

13位ISBN编号：9787510027444

10位ISBN编号：7510027446

出版时间：2010-9

出版时间：世界图书出版公司

作者：J ü rgen Jost,H. Azad

页数：371

内容概要

What is the title of this book intended to signify, what connotations is the adjective "Postmodern" meant to carry? A potential reader will surely pose this question. To answer it, I should describe what distinguishes the ap to analysis presented here from what has by its protagonists been called "Modern Analysis". "Modern Analysis" as represented in the works of the Bourbaki group or in the textbooks by Jean Dieudonn is characterized by its systematic and axiomatic treatment and by its drive towards a high level of abstraction. Given the tendency of many prior treatises on analysis to degenerate into a collection of rather unconnected tricks to solve special problems, this definitely represented a healthy achievement. In any case, for the development of a consistent and powerful mathematical theory, it seems to be necessary to concentrate solely on the internal problems and structures and to neglect the relations to other fields of scientific, even of mathematical study for a certain while. Almost complete isolation may be required to reach the level of intellectual elegance and perfection that only a good mathematic. al theory can acquire. However, once this level has been reached, it can be useful to open one's eyes again to the inspiration coming from concrete external problems. The axiomatic approach started by Hilbert and taken up and perfected by the Bourbaki group has led to some of the most important mathematical contributions of our century, most notably in the area of algebraic geometry. This development was definitely beneficial for many areas of mathematics, but for other fields this was not true to the same extent. In geometry, the powerful tool of visual imagination was somewhat neglected,and global nonlinear phenomena connected with curvature could not always be addressed adequately. In analysis, likewise, perhaps too much emphasis laid on the linear theory, while the genuinely nonlinear problems were found to be too diverse to be subjected to a systematic and encompassing theory. This effect was particularly noticable in the field of partial differential equations. This branch of mathematics is one of those that have experienced the most active and mutually stimulating interaction with the sciences, and those equations that arise in scientific applications typically exhibit some genuinely nonlinear structure because of self-interactions and other effects.

书籍目录

sobolev functions whose weak derivatives are integrable to a sufficiently highpower, poincare inequality, compactness theorem of rellich-kondrachov on the lp-convergence of sequences with bounded sobolev norm.exercises chapter vi. introduction to the calculus of variations and elliptic partial differential equations 21. hilbert spaces. weak convergence definition and properties of hilbert spaces, riesz representation theorem, weak convergence, weak compactness of bounded sequences, banach-saks lemma on the convergence of convex combinations of bounded sequences. exercises 22. variational principles and partial differential equations dirichlet's principle, weakly harmonic functions, dirichlet problem, euler-lagrange equations, variational problems, weak lower semicontinuity of variational integrals with convex integrands, examples from physics and contim/um mechanics, hamilton's principle, equilibrium states, stability, the laplace operator in polar coordinates. exercises 23. regularity of weak solutions smoothness of weakly harmonic functions and of weak solutions of general elliptic pdes, boundary regularity, classical solutions. exercises 24. the maximum principle weak and strong maximum principle for solutions of elliptic pdes,boundary point lemma of e. hopf, gradient estimates, theorem of liouville. exercises 25. the eigenvalue problem for the laplace operator eigenfunctions of the laplace operator form a complete orthonormal basis of l2 as an application of the rellich compactness theorem.exercises index