

## <<偏微分方程讲义>>

### 图书基本信息

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## 前言

In the mid-twentieth century the theory of partial differential equations was considered the summit of mathematics, both because of the difficulty and significance of the problems it solved and because it came into existence later than most areas of mathematics. Nowadays many are inclined to look disparagingly at this remarkable area of mathematics as an old-fashioned art of juggling inequalities or as a testing ground for applications of functional analysis. Courses in this subject have even disappeared from the obligatory program of many universities (for example, in Paris). Moreover, such remarkable textbooks as the classical three-volume work of Goursat have been removed as superfluous from the library of the University of Paris-7 (and only through my own intervention was it possible to save them, along with the lectures of Klein, Picard, Hermite, Darboux, Jordan). The cause of this degeneration of an important general mathematical theory into an endless stream of papers bearing titles like "On a property of a solution of a boundary-value problem for an equation" is most likely the attempt to create a unified, all-encompassing, superabstract "theory of everything."

The principal source of partial differential equations is found in the continuous-medium models of mathematical and theoretical physics. Attempts to extend the remarkable achievements of mathematical physics to systems that match its models only formally lead to complicated theories that are difficult to visualize as a whole, just as attempts to extend the geometry of second-order surfaces and the algebra of quadratic forms to objects of higher degrees quickly leads to the detritus of algebraic geometry with its discouraging hierarchy of complicated degeneracies and answers that can be computed only theoretically. The situation is even worse in the theory of partial differential equations: here the difficulties of noncommutative algebraic geometry are inextricably bound up with noncommutative differential algebra, in addition to which the topological and analytic problems that arise are profoundly nontrivial.

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### 内容概要

In the mid-twentieth century the theory of partial differential equations was considered the summit of mathematics, both because of the difficulty and significance of the problems it solved and because it came into existence later than most areas of mathematics. Nowadays many are inclined to look disparagingly at this remarkable area of mathematics as an old-fashioned art of juggling inequalities or as a testing ground for applications of functional analysis. Courses in this subject have even disappeared from the obligatory program of many universities (for example, in Paris). Moreover, such remarkable textbooks as the classical three-volume work of Goursat have been removed as superfluous from the library of the University of Paris-7 (and only through my own intervention was it possible to save them, along with the lectures of Klein, Picard, Hermite, Darboux, Jordan )

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