

<<流体动力学中的拓扑方法>>

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前言

Hydrodynamics is one of those fundamental areas in mathematics where progress at any moment may be regarded as a standard to measure the real success of mathematical science. Many important achievements in this field are based on profound theories rather than on experiments. In fact, those hydrodynamical theories stimulated developments in the domains of pure mathematics, such as complex analysis, topology, stability theory, bifurcation theory, and completely integrable dynamical systems. In spite of all this acknowledged success, hydrodynamics with its spectacular empirical laws remains a challenge for mathematicians. For instance, the phenomenon of turbulence has not yet acquired a rigorous mathematical theory. Furthermore, the existence problems for the smooth solutions of hydrodynamic equations of a three-dimensional fluid are still open. The simplest but already very substantial mathematical model for fluid dynamics is the hydrodynamics of an ideal (i.e., of an incompressible and inviscid) homogeneous fluid. From the mathematical point of view.

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内容概要

Hydrodynamics is one of those fundamental areas in mathematics where progress at any moment may be regarded as a standard to measure the real success of mathematical science. Many important achievements in this field are based on profound theories rather than on experiments. In fact, those hydrodynamical theories stimulated developments in the domains of pure mathematics, such as complex analysis, topology, stability theory, bifurcation theory, and completely integrable dynamical systems. In spite of all this acknowledged success, hydrodynamics with its spectacular empirical laws remains a challenge for mathematicians.

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