Infos zu Pierini, Stefano: Oceanic and Atmospheric Fluid Dynamics (2025)

Inhaltsangabe:

This introductory text, based on the author's long-standing teaching experience, aims to provide a basic preparation of fluid dynamics, with particular attention to the dynamics of the oceans and the atmosphere, which require consideration of the Coriolis force. The most salient features of this text are its simplicity and compactness. As for simplicity, much attention has been paid to the connections between the various topics, not skimping on simple and intuitive explanations, so that the reader can easily acquire a unitary vision of the subject. As for its compactness, this is evident in the limited, yet sufficiently broad, range of topics analyzed, considered fundamental. This text is, therefore, particularly suitable for a wide audience of upper undergraduate students, but it also constitutes a valuable resource for master's and doctoral students, as well as to researchers who carry out their scientific activity in the broad context of meteorology, oceanography, and climatology.

Inhaltsverzeichnis:

Autor:

Pierini, Stefano:

Stefano Pierini is a full professor of Oceanography, Meteorology and Climatology at the Parthenope University of Naples. He received his Laurea in Physics -Magna Cum Laude- at the La Sapienza University of Rome and carried out his post-Laurea research activity at the same university and at the Department of Applied Mathematics and Theoretical Physics of the University of Cambridge (UK). He then benefited from several research scholarships and projects that allowed him to visit the University of Florida, the Massachusetts Institute of Technology (MIT), Hamburg University, Utrecht University, SINTEF (Norway), CNRS (Grenoble) and the Institut Henry Poincaré (Paris). Pierini has held university professorships since 1984 at the Naval University Institute of Naples, University of L'Aquila and Parthenope University of Naples. Pierini is the author of 85 publications in the main scientific journals in his field (a third of which are single-author papers, in 12 other articles he is the lead author). Pierini coordinated five projects of the European Commission and was also the coordinator of research units of several other European and national projects. His current research interests focus on the application of nonlinear dynamical systems theory to some relevant aspects of climate physics, such as the characterization of the link between astronomical forcing and glacial terminations and the intrinsic variability of the Kuroshio Extension, Gulf Stream and Antarctic Circumpolar Current. The adopted methodologies include the numerical resolution of the PDEs of fluid dynamics and of the ODEs of low-dimensional spectral models, as well as laboratory experiments with rotating platforms. In the past, Pierini has studied various aspects of the wind-driven ocean circulation, Rossby waves, regional and coastal oceanography, nonlinear and dispersive long waves and nonlinear stability analysis of geophysical flows.