



The Physics of Glaciers, Fourth Edition

By Kurt M. Cuffey, W. S. B. Paterson

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The Physics of Glaciers, Fourth Edition, discusses the physical principles that underlie the behavior and characteristics of glaciers. The term glacier refers to all bodies of ice created by the accumulation of snowfall, e.g., mountain glaciers, ice caps, continental ice sheets, and ice shelves. Glaciology-the study of all forms of ice-is an interdisciplinary field encompassing physics, geology, atmospheric science, mathematics, and others. This book covers various aspects of glacier studies, including the transformation of snow to ice, grain-scale structures and ice deformation, mass exchange processes, glacial hydrology, glacier flow, and the impact of climate change. The present edition features two new chapters: “Ice Sheets and the Earth System” and “Ice, Sea Level, and Contemporary Climate Change.” The chapter on ice core studies has been updated from the previous version with new material. The materials on the flow of mountain glaciers, ice sheets, ice streams, and ice shelves have been combined into a single chapter entitled “The Flow of Ice Masses.”

- Completely updated and revised, with 30% new material including climate change
- Accessible to students, and an essential guide for researchers
- Authored by preeminent glaciologists

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- Sales Rank: #1157733 in Books
- Published on: 2010-05-17
- Original language: English
- Number of items: 1
- Dimensions: 10.00" h x 8.00" w x 1.25" l, 2.90 pounds
- Binding: Hardcover
- 704 pages

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Editorial Review

Review

"In the preface to the first edition of The Physics of Glaciers, published in 1969, Stan Paterson made note of the impressive observational and theoretical advances that had taken place during the preceding two decades and set the stage for his efforts to summarize the state of the field. The pace of data collection has continued to accelerate with the development of an impressive array of new tools and techniques and the added incentive of current concerns over the response and role of glaciers and ice sheets in a warming climate. Now we arrive at the fourth edition, a collaborative effort by Paterson and Kurt Cuffey to provide an updated assessment of glacier physics and related topics. The result is a major achievement, involving a comprehensive rewriting and reorganization of the material contained in earlier editions, and including a significant amount of new material that will be appreciated by both old and new audiences."--Pure and Applied Geophysics *"The interested reader will find much else to enjoy in this book. For example, by using square brackets for grouping, and curved parentheses for arguments of functions, the equations are easier to read than typical. The appendix on stress and strain will be a favorite of students in classes extending far beyond glaciology. In short, The Physics of Glaciers by Cuffey and Paterson is at once instructive and authoritative, a textbook and a reference source. It is a towering intellectual achievement that, quite simply, defines the science of glaciers. Modern students may not be as easily impressed as I was three decades ago, but I expect that in addition to bragging about talking to 'the W.S.B. Paterson', students will be celebrating meeting 'the K.M. Cuffey' for a long time to come."--Journal of Glaciology, Vol. 57, No. 202, 2011, page 383*

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