

Atmosphere, Clouds, and Climate (Princeton Primers in Climate)

By David Randall

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The atmosphere is critical to climate change. It can amplify shifts in the climate system, and also mitigate them. This primer offers a short, reader-friendly introduction to these atmospheric processes and how they work, written by a leading expert on the subject.

Giving readers an overview of key atmospheric processes, David Randall looks at how our climate system receives energy from the sun and sheds it by emitting infrared radiation back into space. The atmosphere regulates these radiative energy flows and transports energy through weather systems such as thunderstorms, monsoons, hurricanes, and winter storms. Randall explains how these processes work, and also how precipitation, cloud formation, and other phase changes of water strongly influence weather and climate. He discusses how atmospheric feedbacks affect climate change, how the large-scale atmospheric circulation works, how predicting the weather and the climate are fundamentally different challenges, and much more. This is the ideal introduction for students and nonspecialists. No prior experience in atmospheric science is needed, only basic college physics.

Authoritative and concise, *Atmosphere, Clouds, and Climate* features a glossary of terms, suggestions for further reading, and easy-to-follow explanations of a few key equations. This accessible primer is the essential introduction to atmospheric processes and the vital role they play in our climate system.

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Editorial Review

Review

"Readers ready for a book-length treatment of [the role of clouds in climate] may find the right level of detail in *Atmosphere, Clouds, and Climate*, a new book by Dr. Randall."--**Justin Gillis, *NYTimes.com's Green blog***

"In four chapters and a mere 139 pages, Randall provides readers with an impressively thorough conceptual understanding of the atmosphere's central role in climate. . . . His passion consistently shines through."--**Spencer Hill, *Science***

"This book, part of the Princeton Primers in Climate series, is a very lucid and enjoyable introduction to weather and climate. Randall provides basic technical details, usually in the appendixes, but he devotes considerable effort to making the nine-chapter text accessible to a wide audience by including intuitive explanations for the concepts presented. . . . Suitable for academic students and interested professionals who wish to have a basic understanding of the atmosphere."--**Choice**

"[T]his primer does exactly what it sets out to do--provide a concise but rigorous introduction to a complex subject that affects us all on all scales."--**John Brittan, *Leading Edge***

From the Back Cover

"In this book, one of the leaders of the field condenses a huge amount of climate theory into a very small space. This is done in an informal narrative style with a minimum of equations and other hard technical details, but with a serious dedication to constructing a coherent and logical storyline without glossing over essentials. I have not seen another book like this."--**Adam Sobel, *Columbia University***

"*Atmosphere, Clouds, and Climate* achieves a good balance between intuitive physical reasoning and more formal arguments where necessary. This lucid book gives a tour of the most important atmospheric processes determining climate."--**Tapio Schneider, *California Institute of Technology***

About the Author

David Randall is professor of atmospheric science at Colorado State University.

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