



# Atmospheric Convection

*By Kerry A. Emanuel*

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## Atmospheric Convection By Kerry A. Emanuel

This graduate-level meteorology text and reference provides a scientifically rigorous description of the many types of convective circulations in the Earth's atmosphere. These range from small-scale, convectively driven turbulences in the boundary layer to precipitating systems covering many thousands of square kilometers. The text introduces the principal techniques used in understanding and predicting convective motion: theory, field experiment, and numerical modelling. Part I explores dry convection, including turbulent plumes and thermals from isolated buoyancy sources, Raleigh-Benard convection, and turbulent convection in the planetary boundary layer. Emphasis is placed on applying theoretical understanding and lessons from experiments. Part II offers a complete treatment of the thermodynamics of moist and cloudy air, including fundamental laws, conserved quantities, graphical techniques, and stability. Part III explores the characteristics of individual convective clouds, thunderstorms, squall lines, mesoscale convective systems, and slantwise convection. Part IV studies the ensemble effects of convective clouds, including stratocumulus at trade cumulus boundary layers and the representation of convective clouds in numerical models. Each chapter is followed by a set of exercises.

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## **Editorial Review**

### **Review**

"[A]n excellent monograph by a leading atmospheric scientist...will be consulted by everyone interested in the complexities of dynamical meteorology and in the improvement of practical methods of climate and weather prediction."--Physics Today

"Exceptionally interesting....Stimulating....Moist convection is not easy to characterize by models that can be analyzed analytically and yet illuminate essential physical mechanisms. The strength of this book is to blaze an intellectual trail through the field by collecting such models and presenting them and their assumptions completely and clearly enough that readers can derive and understand for themselves all essential equations and results....A major contribution that belongs on the bookshelf of any scholar of the subject. Its orientation toward conceptual models also makes it particularly useful for and accessible to researchers in areas such as climate dynamics....Makes a nice (and affordable) textbook on atmospheric convection for mathematically inclined advanced graduate students and it includes exercises of all levels of difficulty." --Christopher S. Bretherton, University of Seattle, Bulletin of the American Meteorological Society

"The author...has written an excellent graduate level teaching text....If the reviewer had not inherited the book by way of reviewing, he would have gone out and bought it anyway for its contained value in shaping and forming one's avenue of approach to the subject - praise enough, indeed!--Physics in Canada

"Each chapter concludes with exercises for students and the author gives as well the e-mail address from which codes useful for solving some of them are available. The clear layout of the text and the favorable selection of the illustrations should also be emphasized...Useful not only for students but for professionals as well. A valuable contribution to the library of meteorological textbooks and monographs."--Krzysztof Haman, Institute of Geophysics

### **About the Author**

Kerry A. Emanuel, Ph. D., is Professor, and Director of the Center for Meteorology and Physical Oceanography at Massachusetts Institute of Technology.

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**Jill White:**

The book untitled Atmospheric Convection contain a lot of information on this. The writer explains your ex idea with easy way. The language is very easy to understand all the people, so do not really worry, you can easy to read the idea. The book was compiled by famous author. The author will take you in the new period of time of literary works. You can actually read this book because you can continue reading your smart phone, or device, so you can read the book in anywhere and anytime. If you want to buy the e-book, you can open their official web-site and order it. Have a nice examine.

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