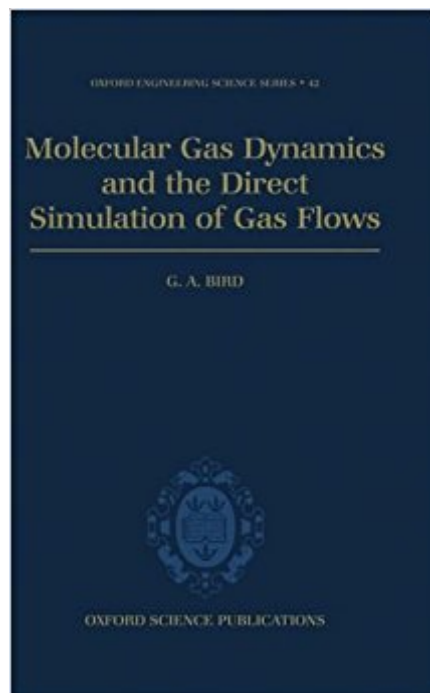




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Molecular Gas Dynamics And The Direct Simulation Of Gas Flows (Oxford Engineering Science Series)



Synopsis

The direct simulation Monte Carlo (DSMC) method has, in recent years, become widely used for engineering and scientific studies of gas flows that involve low densities or very small physical dimensions. The method is a direct physical simulation of the motion of representative molecules, rather than a numerical solution of the equations that provide a mathematical model of the flow. The computations are no longer expensive and the period since the original 1976 publication of this work has seen enormous improvements in the molecular models, the procedures, and the implementation strategies. This greatly expanded new version of the author's seminal *Molecular Gas Dynamics* will be considered the definitive text on the subject. It includes all the refinements and research since the earlier book. The molecular theory of gas flows is developed from first principles and is extended to cover new models and procedures. The method and typical applications are illustrated through 13 demonstration programs that are listed in FORTRAN source code on a companion website. All numerical results in the book have been obtained from these programs. The applications range from verification cases for simple homogeneous gases to complex multidimensional flows of gas mixtures and chemically reacting flows.

Book Information

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Customer Reviews

"This book discusses fundamentals of rarefied gas dynamics, focusses on the numerical simulation of physical situations and provides applications to test cases. . .The book profits mainly from the immense practical experience of the author. . .It is recommended to people who are interested in

gaining insight into practical aspects and applications in the field." --Mathematical Reviews

G. A. Bird is at University of Sydney.

An astonishing accomplishment by the man who more or less invented the field of DSMC calculation. Includes a handy-dandy disk (with source) so you can run you own problem with a variety of different boundary conditions. See also Bird 1973, Phys Fluids, v16 pp1830-1834.

Despite the odd typographical error, this book is outstanding. It is clear, concise and quite readable. Material is presented in a manner which is easy to understand. The only slight criticisms are that my copy did not include the promised computer disk, that often the descriptions of what the code does are often hard to understand and that the binding on the book is of extremely poor quality (my copy was losing pages within days of purchase). Otherwise very highly recommended.

I gave the material in the book 5 stars, but the new edition 0 stars (at least for ~\$200). My advisor just bought the newest edition (the old one finally falling apart after years of use) and it is cheaply made. The binding is already coming apart and the text is difficult to read because the text is fuzzy. Hopefully Dr. Bird will write a newer edition with some of the most recent advances and a better printing.

I am doing my Ph.D. in the area of Direct Simulation Monte Carlo, and this book is the bible on the subje^tc, written by the creator of the area himself. I do recomend this book.

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