

Marlow Anderson

The Physics of Scuba Diving



Nottingham
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This book provides a fun introduction to the mathematics and physics needed to really understand scuba diving; it was written by an enthusiastic scuba diver, who is also a mathematician.

It is written for the lay person, and assumes only a willingness to express basic scientific relationships using mathematical equations. It describes all of the basics regarding pressure, depth and density, covered more completely than in the typical open water diving course. But in addition, it looks at the mathematical background for dive tables and dive computers, tools divers use to avoid getting decompression sickness. The basic Haldane theory of nitrogen on-gassing and off-gassing is explained, in more depth than is found in popular literature.

The Physics of Scuba Diving will appeal to divers interested in a bit more background than is available in the popular literature, and to people interested in how basic science and mathematics has a large impact on the sport of scuba diving. The book has been used as a textbook for a popular introduction to mathematical thinking.

Contents

Preface • Pressure • Buoyancy • Boyle's Law • Ideal Gas Laws • Water • The Exponential Function • Modeling Nitrogen Absorption • The Bends • The Navy Dive Tables • The Mathematics of the Navy Tables • Variations on Table Use • Recreational Diving • Appendix A: Units of Measurement • Appendix B: Specific Gravity • Appendix C: Air • Appendix D: Rules of Exponents • Appendix E: The US Navy Dive Tables • Bibliography and suggestions for Further Reading • Index

A professor of maths at The Colorado College, in Colorado Springs, Marlow received his undergraduate degree from Whitman College, studied algebra at the University of Kansas and received his PhD in 1978. He has co-authored a technical monograph and a textbook in maths, and has co-edited two books on its history. Scuba diving since 1996, he became a PADI assistant instructor in diving in 1998, and has been able to share his passion for both maths and scuba diving with many students.



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