

Volcanic Worlds: Exploring the Solar System's Volcanoes

Rosalyn M. C. Lopes and Tracy K. P. Gregg

The study of volcanoes throughout the Solar System is an exciting subject in part because of the dynamic nature of volcanoes on Earth, and in part because of the wonder in exploring alien worlds only to find variations on a familiar theme. This book goes a long way to demonstrate to the non-specialist reader that studying volcanoes, be they on the Earth's ocean floor, in the wilds of Earth's polar regions, or on other planets, is indeed fun. It also shows that understanding the diversity of planetary volcanism provides critical insights into the internal workings of planets throughout the history of the Solar System.

Arriving just days before this reviewer gave a Careers Day talk at a local high school, I have already found that one of the most valuable aspects of this book lies in inspiring the next generation of planetary volcanologists. This comes from the few paragraphs of personal history for each of the authors, describing at the start of each chapter how they each came to be excited by volcanoes. A rarity in a research book such as this, there are many personal aspects that add insight into the motivation of the scientists. For example, there is a charming photograph of a young Katharine Cashman, beaming with excitement at seeing her first active volcano (Mount Erebus in Antarctica), which will surely compel many junior readers to see a live volcano for themselves. Several chapters also provide insights into what motivates a scientist, and how the common topic of planetary volcanology has propelled all of the contributing authors into careers as world-class scientists. For instance, Lisa Gaddis talks with great enthusiasm about "The Moon has been mine as long as I can remember", thereby motivating her career in the spectroscopic analysis of lunar volcanic deposits.

The book also clearly demonstrates that scientists are not boring, and that much of their work is done far from the shining white laboratories that many students believe is the center of all space research. For instance, Rosalyn Lopes amusingly describes her furtive late-night efforts to bring three space scientists back to her hotel room in Italy in order to download the latest images of volcanoes on Io as they had just been collected by the Galileo spacecraft.

Unique aspects of the book include a fascinating view by Tracy Gregg into the details of diving on to submarine volcanoes in research vessels such as Alvin. Joy Crisp adds a discussion of the design and operation of rovers for the exploration of the surface of Mars, while Susan Kieffer's chapter on the similarities between geysers on Earth, Io and Triton does a fine job in showing the comparative nature of the subject.

The book is not without some limitations, however. Greater attention to providing a consistent overview of the spatial distribution of volcanic activity on each planetary body would help the novice reader. In cases such as volcanism on Venus, the book fails to show where volcanic landforms have been found, focusing instead on the types of

volcanic features that have been found. Disappointingly, the chapter on Martian volcanoes seen from orbit provides only a brief introduction to the diversity of volcanic landforms on the Red Planet and how calderas, lava flows and volcano-tectonic features can be compared with terrestrial examples. The diversity of volcanism on Mars is left to the chapter by Mary Chapman and Gudrun Larsen, who discuss field strategies for the analysis of terrestrial analogs to Martian explosive volcanic products. It would also have been stimulating to find a discussion of volcanism on asteroids such as Vesta, where meteorites collected on Earth suggest that there has been basaltic volcanism at some early stage of the asteroid's formation.

Photographic reproduction in "*Volcanic Worlds*" is generally good, although the color images would have been improved had a better quality glossy paper been used. I particularly liked the fact that several chapters provide helpful bibliographies for further reading. More consistency in this area between the individual contributed chapters would have improved the overall value of the book as an introduction to a diverse range of topics. The audience for the book is somewhat difficult to identify. In terms of a motivational text, it is best suited for high school and undergraduate college students. However, the price of the book (\$59.95) is high for these groups to purchase and read, so that one hopes that a paperback version will soon be available.

While the back cover says that this is the first general review of volcanic activity throughout the Solar System, the classic "*Volcanoes of the Earth, Moon and Mars*" by Gilbert Fielder and Lionel Wilson (1975) more correctly started the serious discussion of volcanism on the planets. Other books have followed, notably "*Planetary Volcanism*" by Peter Cattermole (1989), and "*Environmental Effects on Volcanic Eruptions*" edited by James Zimbelman and Tracy Gregg (2000). And excellent chapters on planetary volcanism were also included in earlier books such as "*Volcanoes: A Planetary Perspective*" by Peter Francis (1993), and "*Volcanoes*" by David Rothery (2001). Thus "*Volcanic Worlds*" is not unique, but nevertheless the approach that Lopes and Gregg take, and the enthusiastic writing of the authors, is bound to make this book a fine addition to the library of any volcanologists, be she (or he) interested in volcanism on Earth or beyond.

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