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Nota di contenuto	Introduction / Sarah A. Fagents, Tracy K. P. Gregg and Rosaly M. C. Lopes -- Magma chamber dynamics and thermodynamics / Josef Dufek, Chris Huber and Leif Karlstrom -- The dynamics of dike propagation / Steve Tait and Benoit Taisne -- Dynamics of magma ascent in the volcanic conduit / Helge M. Gonnermann and Michael Manga -- Lava flows / Andrew J. L. Harris -- Unsteady explosive activity: strombolian eruptions / Mike R. James, Steve J. Lane and Bruce F. Houghton -- Unsteady explosive activity: vulcanian eruptions / Amanda B. Clarke -- Sustained explosive activity: volcanic eruption columns and Hawaiian fountains / Andrew W. Woods -- Modeling tephra sedimentation from volcanic plumes / Costanza Bonadonna and Antonio Costa -- Pyroclastic density currents / Olivier Roche, Jeremy C. Phillips and Karim Kelfoun -- Magma-water interactions / Ken Wohletz, Bernd Zimanowski and Ralf Buttner -- Deep sea eruptions / Tracy K. P.

Gregg -- Magma-ice interactions / Lionel Wilson, John L. Smellie and James W. Head -- Modeling lahar behavior and hazards / Vernon Manville, Jon J. Major and Sarah A. Fagents -- Introduction to quantitative volcano seismology: fluid-driven sources / Bernard Chouet -- Volcano acoustics / Milton A. Garces, David Fee and Robin Matoza -- Planetary volcanism / Rosaly M. C. Lopes, Sarah A. Fagents, Karl L. Mitchell and Tracy K. P. Gregg.

Sommario/riassunto

Understanding the physical behavior of volcanoes is key to mitigating the hazards active volcanoes pose to the ever-increasing populations living nearby. The processes involved in volcanic eruptions are driven by a series of interlinked physical phenomena, and to fully understand these, volcanologists must employ various physics subdisciplines. This book provides the first advanced-level, one-stop resource examining the physics of volcanic behavior and reviewing the state-of-the-art in modeling volcanic processes. Each chapter begins by explaining simple modeling formulations and progresses to present cutting-edge research illustrated by case studies. Individual chapters cover subsurface magmatic processes through to eruption in various environments and conclude with the application of modeling to understanding the other volcanic planets of our Solar System. Providing an accessible and practical text for graduate students of physical volcanology, this book is also an important resource for researchers and professionals in the fields of volcanology, geophysics, geochemistry, petrology and natural hazards.