

1. Record Nr.	UNINA9910678252303321
Autore	Rubin Alan E.
Titolo	Surface/Volume : How Geometry Explains Why Grain Elevators Explode, Hummingbirds Hover, and Asteroids are Colder than Ice / / by Alan E. Rubin
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2023
ISBN	9783031237492
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (187 pages)
Disciplina	516.36 620.44
Soggetti	Engineering mathematics Engineering - Data processing Planetary science Engineering geology Mathematical and Computational Engineering Applications Planetary Science Geoengineering Superfícies (Matemàtica) Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- A Truncated History of Geometry -- Middle School Math -- Asteroids, Moons, Planets, and Meteorites -- Geologic Processes -- Geometry of Life -- Biochemistry -- Chemical Reactions -- Ecology -- Manufacturing.
Sommario/riassunto	This book explains that diffusion, osmosis, dissolution, evaporation, and heat loss all preferentially affect small bodies due to their high surface/volume ratios. Because surface area increases as the square of length, but volume (and mass) increase as the cube, large objects have low surface/volume ratios and small objects have high surface/volume ratios. This simple physical constraint governs much of the physical world. It accounts for why the Earth has active volcanoes, but the Moon does not, why the human brain has numerous folds, why deciduous

trees lose their leaves every Fall, and why nanoparticles of gold melt at surprisingly low temperatures. It is a phenomenon well known to every scientist, but this book is the first comprehensive treatment of this effect.
