

1. Record Nr.	UNINA9910141499003321
Titolo	Impact cratering [[electronic resource] ] : processes and products // edited by Gordon R. Osinski and Elisabetta Pierazzo
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Blackwell, 2013
ISBN	1-118-44730-1 1-299-15776-9 1-118-44733-6 1-118-44732-8
Descrizione fisica	1 online resource (364 p.)
Altri autori (Persone)	OsinskiGordon R PierazzoElisabetta
Disciplina	551.21 551.3/97 551.397
Soggetti	Impact craters Cratering Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Title page; Copyright page; Dedication; Contents; Preface; List of contributors; ONE: Impact cratering: processes and products; 1.1 Introduction; 1.2 Formation of hypervelocity impact craters; 1.2.1 Contact and compression; 1.2.2 Excavation stage; 1.2.3 Modification stage; 1.2.4 Post-impact hydrothermal activity; 1.3 Morphology and morphometry of impact craters; 1.3.1 Simple craters; 1.3.2 Complex craters; 1.3.3 Multi-ring basins; 1.4 Impactites; 1.4.1 Classification of impactites; 1.4.2 Impact melt-bearing impactites; 1.5 Recognition of impact craters 1.6 Destructive effects of impact events 1.7 Beneficial effects of impact events; 1.7.1 Microbiological effects; 1.7.2 Economic effects; 1.8 When a crater does not exist: other evidence for impact events; 1.9 Concluding remarks; References; TWO: Population of impactors and the impact cratering rate in the inner Solar System; 2.1 Introduction; 2.2 Population of impactors in the inner Solar System; 2.3 Impact frequency

of NEOs with the Earth; 2.4 Comparison with the impact record on terrestrial planets; 2.4.1 The Earth; 2.4.2 The other terrestrial planets  
2.5 Variability of the impact frequency during the last 3 Ga  
2.6 The early cratering history of the Solar System; 2.7 Conclusions; References;  
THREE: The contact and compression stage of impact cratering; 3.1 Introduction; 3.2 Maximum pressures during contact and compression; 3.2.1 The planar impact approximation; 3.2.2 Energy partition during compression; 3.2.3 Unloading of the projectile; 3.3 Jetting during contact and compression; 3.4 The isobaric core; 3.5 Oblique impact; 3.6 The end of contact and compression; References; FOUR: Excavation and impact ejecta emplacement; 4.1 Introduction  
4.2 Excavation  
4.3 Impact plume; 4.4 Generation of continuous ejecta blankets; 4.5 Rayed craters; 4.6 Generation of multiple ejecta layers; 4.6.1 Observations; 4.6.2 Initial impact melt production and early emplacement; 4.6.3 Late-stage melt emplacement - the surface melt flow phase; 4.7 Distal impact ejecta; 4.8 Depth of excavation; References; FIVE: The modification stage of crater formation; 5.1 Introduction; 5.2 Morphology and morphometry of simple and complex impact craters; 5.2.1 Simple crater morphology; 5.2.2 Complex crater morphology; 5.2.3 Crater morphology as a function of size  
5.3 Kinematics of crater collapse  
5.3.1 Kinematics of simple crater formation; 5.3.2 Kinematics of complex crater formation; 5.4 Subsurface structure of complex impact craters; 5.4.1 Crater rim; 5.4.2 Ring syncline; 5.4.3 Central uplift; 5.4.4 Peak ring; 5.5 Mechanics of cavity collapse: what makes the target so weak?; 5.5.1 Target disintegration into blocks; 5.5.2 Distributed and localized brittle deformation; 5.5.3 Localized melting; 5.5.4 Temporary weakening; 5.6 Effects of oblique impact incidences on cavity collapse; 5.7 Effects of rheologically complex targets on cavity modification  
References

---

## Sommario/riassunto

Impact cratering is arguably the most ubiquitous geological process in the Solar System. It has played an important role in Earth's history, shaping the geological landscape, affecting the evolution of life, and generating economic resources. However, it was only in the latter half of the 20th century that the importance of impact cratering as a geological process was recognized and only during the past couple of decades that the study of meteorite impact structures has moved into the mainstream. This book seeks to fill a critical gap in the literature by providing an overview text covering

---