

|                         |  |
|-------------------------|--|
| 1. Record Nr.           | UNINA9910785307503321  |
| Autore                  | Jaupart Claude   |
| Titolo                  | Heat generation and transport in the Earth // Claude Jaupart, Jean-Claude Mareschal [[electronic resource]]  |
| Pubbl/distr/stampa      | Cambridge : , : Cambridge University Press, , 2011   |
| ISBN                    | 1-107-21942-6<br>0-511-78177-6<br>1-282-96724-X<br>9786612967245<br>0-511-99151-7<br>0-511-99053-7<br>0-511-98871-0<br>0-511-99250-5<br>0-511-98691-2  |
| Descrizione fisica      | 1 online resource (xii, 464 pages) : digital, PDF file(s)  |
| Disciplina              | 551.1  |
| Soggetti                | Terrestrial heat flow<br>Earth (Planet) Internal structure   |
| Lingua di pubblicazione | Inglese  |
| Formato                 | Materiale a stampa   |
| Livello bibliografico   | Monografia   |
| Note generali           | Title from publisher's bibliographic system (viewed on 05 Oct 2015).   |
| Nota di bibliografia    | Includes bibliographical references and index.   |
| Nota di contenuto       | Machine generated contents note: Introduction; Credits; 1. Historical notes; 2. Internal structure of the Earth; 3. Basic equations; 4. Heat conduction; 5. Heat transport by convection; 6. Thermal structure of the oceanic lithosphere; 7. Thermal structure of the continental lithosphere; 8. Global energy budget; 9. Mantle convection; 10. Thermal evolution of the Earth; 11. Magmatic and volcanic systems; 12. Environmental problems; 13. New and old challenges; Appendix A. A primer on Fourier and Laplace transforms; Appendix B. Green's functions; Appendix C. About measurements; Appendix D. Physical properties; Appendix E. Heat production; List of symbols; References; Index. |
| Sommario/riassunto      | Heat provides the energy that drives almost all geological phenomena and sets the temperature at which these phenomena operate. This   |

book explains the key physical principles of heat transport with simple physical arguments and scaling laws that allow quantitative evaluation of heat flux and cooling conditions in a variety of geological settings and systems. The thermal structure and evolution of magma reservoirs, the crust, the lithosphere and the mantle of the Earth are reviewed within the context of plate tectonics and mantle convection - illustrating how theoretical arguments can be combined with field and laboratory data to arrive at accurate interpretations of geological observations. Appendices contain data on the thermal properties of rocks, surface heat flux measurements and rates of radiogenic heat production. This book can be used for advanced courses in geophysics, geodynamics and magmatic processes, and is a reference for researchers in geoscience, environmental science, physics, engineering and fluid dynamics.

---