

1. Record Nr.	UNINA9910637714803321
Autore	Rapp Donald <1934->
Titolo	Human Missions to Mars : Enabling Technologies for Exploring the Red Planet / / by Donald Rapp
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	9783031207266 9783031207259
Edizione	[3rd ed. 2023.]
Descrizione fisica	1 online resource (650 pages)
Collana	Astronautical Engineering, , 2365-9602
Disciplina	629.4 629.4553
Soggetti	Outer space - Exploration Astronautics Aerospace engineering Solar system Automatic control Robotics Automation Space Exploration and Astronautics Aerospace Technology and Astronautics Space Physics Control, Robotics, Automation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Why Explore Mars? -- 2. Planning Space Campaigns and Missions -- 3. 60+ Years of Humans to Mars Mission Planning -- 4. Getting There and Back -- 5. Critical Mars Mission Elements -- 6. In Situ Utilization of Indigenous Resources -- 7. Why the NASA approach will likely fail to send humans to Mars for many decades to come -- Appendix A. Solar Energy on the Moon -- Appendix B. Solar Energy on Mars -- Appendix C. Water on Mars -- Index.
Sommario/riassunto	A mission to send humans to explore the surface of Mars has been the ultimate goal of planetary exploration since the 1950s, when von Braun

conjectured a flotilla of 10 interplanetary vessels carrying a crew of at least 70 humans. Since then, more than 1,000 studies were carried out on human missions to Mars, but after 70 years of study, we remain in the early planning stages. The third edition of this book provides an annotated history of key Mars mission studies, with quantitative data wherever possible. Retained from the second edition, Donald Rapp looks at human missions to Mars from an engineering perspective. This includes analyzing the steps in the various proposed mission architectures, as well as the various vehicles and supporting technologies that are involved. In this connection, he discusses the status and potential of a wide range of technologies essential to a human mission to Mars, including life support, radiation, and low-gravity effects, getting there and back, in situ resource utilization, and mission safety. Detailed appendices describe availability of solar energy on the Moon and Mars, as well as the distribution of near-surface H₂O. The third edition includes new information acquired from 2015 to 2022: · Significantly expanded discussion of Mars Ascent Vehicle · Discussion of the Moon-Mars connection · Review of a dozen additional Mars mission concepts · Expanded discussion of Ecological Life Support with emphasis on reliability issues · Expanded discussion of missions with nuclear propulsion · Extended review of new NASA Mars directions 2019-2022 · Expanded discussion of human factors and habitats · Expanded discussion of ISRU including results based on “MOXIE” on Mars · 33 new figures · 80 new references.
