1.	Record Nr.	UNINA9910144427803321
	Autore	Goebel Dan M. <1954->
	Titolo	Fundamentals of electric propulsion [[electronic resource]] : ion and Hall thrusters / / Dan M. Goebel, Ira Katz
	Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2008
	ISBN	1-282-26782-5 9786612267826 0-470-43644-1 0-470-43626-3
	Descrizione fisica	1 online resource (528 p.)
	Collana	JPL space science and technology series ; ; 1
	Altri autori (Persone)	KatzIra <1945->
	Disciplina	629.47/55
	Soggetti	Ion rockets
	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	Fundamentals of Electric Propulsion: Ion and Hall Thrusters; Contents; Note from the Series Editor; Foreword; Preface; Acknowledgments; Chapter 1: Introduction; 1.1 Electric Propulsion Background; 1.2 Electric Thruster Types; 1.3 Ion Thruster Geometry; 1.4 Hall Thruster Geometry; 1.5 Beam/plume Characteristics; References; Chapter 2: Thruster Principles; 2.1 The Rocket Equation; 2.2 Force Transfer in Ion and Hall Thrusters; 2.3 Thrust; 2.4 Specific Impulse; 2.5 Thruster Efficiency; 2.6 Power Dissipation; 2.7 Neutral Densities and Ingestion in Electric Thrusters; References; Problems Chapter 3: Basic Plasma Physics 3.1 Introduction; 3.2 Maxwell's Equations; 3.3 Single Particle Motions; 3.4 Particle Energies and Velocities; 3.5 Plasma as a Fluid; 3.5.1 Momentum Conservation; 3.5.2 Particle Conservation; 3.5.3 Energy Conservation; 3.6 Diffusion in Partially Ionized Gases; 3.6.1 Collisions; 3.6.2 Diffusion and Mobility Without a Magnetic Field; 3.6.3 Diffusion Across Magnetic Fields; 3.7 Sheaths at the Boundaries of Plasmas; 3.7.1 Debye Sheaths; 3.7.2 Pre-Sheaths; 3.7.3 Child-Langmuir Sheaths; 3.7.4 Generalized Sheath Solution; 3.7.5 Double Sheaths 3.7.6 Summary of Sheath Effects References; Problems; Chapter 4: Ion Thruster Plasma Generators; 4.1 Introduction; 4.2 Idealized Ion Thruster Plasma Generator; 4.3 DC Discharge Ion Thruster; 4.3.1

Sommario/riassunto

Throughout most of the twentieth century, electric propulsion was considered the technology of the future. Now, the future has arrived. This important new book explains the fundamentals of electric propulsion for spacecraft and describes in detail the physics and characteristics of the two major electric thrusters in use today, ion and Hall thrusters. The authors provide an introduction to plasma physics in order to allow readers to understand the models and derivations used in determining electric thruster performance. They then go on to present detailed explanations of: Thruster