

1. Record Nr.	UNISA996418443203316
Autore	Schrogl Kai-Uwe
Titolo	Handbook of space security : policies, applications and programs // Kai-Uwe Schrogl ; editor-in-chief ; Maarten Adriaensen [and five others]
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2020] ©2020
ISBN	3-030-23210-7
Edizione	[Second edition.]
Descrizione fisica	1 online resource : illustrations
Disciplina	358.8
Soggetti	Space security Seguretat espacial Cooperació internacional Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Introduction -- Advisory Board -- Contents -- About the Editor-in-Chief -- About the Section Editors -- About the Managing Editor -- Contributors -- Part I: International Space Security Setting -- 1 International Space Security Setting: An Introduction -- Foundational Themes -- International Space Security Focus Areas -- Conclusions -- 2 Definition and Status of Space Security -- Introduction -- Definition of Space Security -- Security Definition -- Space Security Evolution -- Space Security Definition -- Status of Space Security -- Africa -- Asia-Pacific -- Europe -- The Middle East -- Latin America -- North America -- Russia -- Key Priorities -- Concluding Remarks: The Way Forward for Space Security -- References -- 3 Challenges to International Space Governance -- Background -- Challenges to International Space Governance -- Increasing Competition in Space -- No Consensus on Space Arms Control -- Increasing Reliance on Space Assets -- Security-Driven Self-Interests of States -- Dual-use of Space Assets -- The USA, Russia, and China in Space -- Proliferation of ASAT Weapons -- Stalemate on Arms Control Treaty Negotiations -- Conclusion -- References -- 4 Spacepower Theory and Organizational Structures --

Introduction -- Noteworthy Efforts to Develop Spacepower Theory -- Spacepower Theory and Current US Space Policy -- Spacepower Theory, Hard Power, and the Quest for Sustainable Security -- Spacepower Theory, Harvesting Energy, and Creating Wealth in and from Space -- Spacepower Theory, Environmental Sustainability, and Survival -- Conclusions -- References -- 5 The Laws of War in Outer Space -- Introduction -- General Principles of Space Law -- Principles Regulating the ``Military`` Uses of Outer Space -- The Laws of War: General Principles -- Distinction -- Military Objective -- Proportionality. The Relevance of the Laws of War to Outer Space -- Regulating the Threat of Space Warfare: Some Recent Initiatives -- Conclusion: Perspectives on the Way Forward -- References -- Further Reading -- 6 Arms Control and Space Security -- Introduction -- Outer Space Treaty -- Moon Agreement -- Arms Control in Outer Space: Historic and Current Efforts -- Partial Test Ban Treaty -- Anti-Ballistic Missile Treaty -- SALT II -- United Nations General Assembly -- Prevention of an Arms Race in Outer Space -- No First Placement of Weapons in Outer Space -- Draft Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Ob... -- International Code of Conduct for Outer Space -- Domestic Arms Control for Outer Space -- Conclusions -- References -- 7 Role of Space in Deterrence -- Introduction -- Space Deterrence -- Deterrence by Punishment -- Deterrence by Denial -- Principles of Space Deterrence -- Primacy of the Adversary's Decision-Making -- Deterrence Cannot Be Guaranteed -- Credibility and Political Will Are Required -- Effective Communication Is Required -- Managing Escalation May Be Problematic -- Prospects for Strategic Misperception -- Space Deterrence Has a Terrestrial Aspect -- Conclusions -- References -- 8 Resilience of Space Systems: Principles and Practice -- Introduction -- Resilience as Concept in Space Security Policy -- Resilience for Deterrence in an Emerging Threat Environment: US Perspective -- Resilience for Critical Infrastructure Protection and Non-dependence: European Perspective -- Resilient Architecture and Infrastructure: The Mission Assurance and Deterrence Perspective -- Resilience as Key Quality of Functional Architecture -- Functional Elements of Resilient Architecture -- Practical Measures -- Trading Off Resilience and Capability in Architecture. Resilient Operations and Organizations: The High Reliability and Resilience Engineering Perspective -- Resilience Through Sensemaking -- Resilience Through Performance Variability -- Practical Measures -- Assessing Resilience in Operations and Organizations -- Disciplines Contributing to Resilience -- Resilience Through Space Situational Awareness -- Resilience Through Transparency Measures and Partnerships -- Resilience Through Foresight -- Conclusion -- References -- 9 Space Security Cooperation: Changing Dynamics -- Introduction -- The Case for Cooperative Approaches to Space Security -- Moderating Strategic Rivalry: Technical and Utilitarian Modes of Cooperation -- From Practical to Symbolic: Cooperation in Space Exploration -- Expanding Access to Space: Cooperation and Capacity-Building -- Cooperation for Safety and Sustainability -- New Patterns of Cooperation: Space Security Versus National Security -- New Issues: The Moon and Space Resources -- Conclusion: The Future of Space Security Cooperation -- References -- 10 Strategic Competition for Space Partnerships and Markets -- Introduction -- Global Chinese and Russian Economic and Financial Space Activities -- Africa -- Latin America -- Europe -- The Arctic -- Antarctica -- The Middle East -- South and Southeast Asia -- Western, Central, and Eastern Asia -- Top Space Sector Capture Trends -- Key Findings -- Conclusion --

References -- 11 Space Export Control Law and Regulations -- Introduction -- Terminology -- International Legal Regimes -- The Melee of International Legal Instruments on Export Control -- The Specificities of the Outer Space Regime -- National and Regional Legal Regimes -- The Export Control Regime of the United States -- Dual-Use Goods: The Export Administration Regulations (EAR) -- Military Goods: The International Traffic in Arms Regulations. Export Regulations of the European Union -- Dual-Use Items -- The Export Control Regulations of the European Space Agency -- Conclusions -- References -- 12 Space Systems and Space Sovereignty as a Security Issue -- Introduction -- Notion of Sovereignty and Jurisdiction -- Why Does Space Security Matter? -- Space Systems and Security from Space -- State Sovereignty and Homeland Security -- State Sovereignty and the Military Domain of a state -- Military Activity in Space -- Peaceful Use in the Defense Domain -- The Dawn of New Regulations and Space Policy Directives -- Space Systems and Security in Space -- Vertical Territorial Sovereignty -- Space Systems and Economic Sovereignty -- Conclusion -- References -- 13 Critical Space Infrastructures -- Introduction -- Critical Infrastructure Protection -- Critical Space Infrastructures -- Distinguishing Characteristics of SI and CSI -- Critical Space Infrastructure Protection -- Results from Framework Application -- Principles of Resilience -- Complex System Governance -- Conclusions -- References -- 14 Space and Cyber Threats -- Introduction: The European Space Agency and Its Missions -- A Security-Flavored Space -- Hacking in Space: Astro-Hackers? -- Motivations of Attackers -- Threats and Countermeasures -- End-to-End Cybersecurity -- Countermeasures Related to the Information Assurance Properties -- Tele-Commands -- Telemetry -- Payload Data -- ESA's Own Approach to Mission Security -- Mission Categories and Security Profiles -- Conclusions: New Space, New Cyber Threats! -- References -- 15 Space Safety -- Introduction -- The Many Facets of Space Safety -- Acceptable Safety Level -- Safety Standards and Compliance Verification -- Launch Safety -- Launch Site Ground Safety Risk -- Launch Flight Safety Risk -- Launch Risk for Maritime and Air Transportation -- Air-Launch Safety -- On-Orbit Safety. Orbital Debris -- Collision Risk with Orbital Debris -- Controlling Orbital Debris Risk -- Orbital Debris Remediation: Active Debris Removal -- Reentry Safety Risk -- Environmental Risk -- Risk for Aviation -- Existing Regulations and Standards -- Human Spaceflight Safety -- System Safety -- Commercial Suborbital Regulatory Safety Framework: A Case Study -- Self-Regulations: Safety as Business Case -- Prescriptive Requirements Versus Safety Case -- Human Rating: A Historical Perspective -- Human Spaceflight Safety Risks -- Environmental Risk: Ionizing Radiation -- Space Safe and Rescue: Past, Present, and Future -- Ascent Emergencies -- Crashworthiness -- Orbital Rescue -- Conclusions -- References -- 16 Evolution of Space Traffic and Space Traffic Management -- Introduction -- Objects in Orbit -- Protected Regions -- GEO Protected Region -- LEO Protected Region -- Space Debris -- Space Situational Awareness Services -- Space Situational Awareness Data -- Best Practices and Standards -- Changes Coming -- Large LEO Constellations -- Environmental Effects on Satellite Lifetime -- Reentry Disposal of Satellites from Large Constellations -- Active Debris Removal (ADR) -- Effect of Large Constellations on SSA Service Requirements -- Space Situational Awareness and Traffic Management Service Providers -- Conclusions -- References -- 17 Space Sustainability -- Space Security and Space Sustainability -- Space Security -- Space Sustainability -- The United Nations and Space Sustainability -- Space in the UN System -- The

United Nations Committee on the Peaceful Uses of Outer Space -- The International Legal Framework for Space Activities -- COPUOS and Space Sustainability -- Introduction of the Long-Term Sustainability of Outer Space Activities on the Agenda of COPUOS -- COPUOS Working Group on the Long-Term Sustainability of Outer Space Activities. Consideration of Topics.

Sommario/riassunto

Space Security involves the use of space (in particular communication, navigation, earth observation, and electronic intelligence satellites) for military and security purposes on earth and also the maintenance of space (in particular the earth orbits) as safe and secure areas for conducting peaceful activities. The two aspects can be summarized as "space for security on earth" and "the safeguarding of space for peaceful endeavors." The second, updated edition of this handbook provides a sophisticated, cutting-edge resource on the space security portfolio and the associated technology, applications and programs to help fellow members of the global space community and other interested policy-making and academic audiences keep abreast of the current and future directions of this vital dimension of international space policy. Various dimensions of space security as well as space for security on Earth are described, covering space policy and the geopolitics of space, existing and planned applications and programs, as well as technological solutions. This second edition covers the recent space and security developments that have taken place in Europe and worldwide over the last years, along with new challenges that must be addressed. At its conclusion, the book provides forward-looking recommendations, especially in the area of space governance and transparency and confidence-building measures.
