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Yearbook on Space Policy

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Yearbook on Space Policy 2008/2009

Setting New Trends

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Preface

The current global financial and economic crisis does not leave the space sector unaffected. The concrete effects, however, are different from what might have been expected. First of all, no sudden decline in the space market or in programme development took place. This is mainly due to the long-term planning and the long duration of project implementation. Secondly, and this is even more striking, space emerged in the high-level political debates to counter the crises as one promising area to focus on. The European Council of December 2008 stressed this and promoted that space as a “lead market” should be an important element in the European Economic Recovery Plan and the European Plan for Innovation. The 5th European Space Council already in September 2008 had emphasised the contribution of space to implement the Lisbon Strategy and the ESA Council at Ministerial Level in November 2008 had initiated substantive new programmes. Through this, space emerged from the crisis with an even stronger political standing and reputation highlighting its economic potential as never before. The coming months, way into 2011, will show whether this promise can be kept and whether governments actually maintain their high engagement in space programmes and as contractors for satellite systems facing a huge wave of replacements during the next years.

This incidence-driven trend of highlighting the economic potential of space is currently complemented by an already longer-lasting but now thriving tendency. It is the use of space assets for Europe’s security, where the quest for European approaches, concepts and policies gained considerable momentum during the past year: from the growing use of satellite data for European military missions to the establishment of a “structured dialogue” between the European Commission, the European Space Agency (ESA) and the European Defence Agency (EDA) up to the identification of new areas in need for European concepts like space for internal security. In order to stress and signify this accelerating movement the cover of this edition pinpoints at the potential of space assets for Europe’s security.

These are the two most significant new trends in space policy which this new edition of the “Yearbook on Space Policy” analyses in a thorough way. Many more smaller trends and developments have shown up in the reporting period between July 2008 and June 2009. They are all reflected in this Yearbook, which is consequently subtitled “New Trends in Space Policy”. Based on its European focus, the Yearbook also identifies the most notable developments around the world comprising the leading as well as the emerging space powers. Now, with this third edition, the “Yearbook on Space Policy” can present to the reader a multi-

year development of space activities, the governmental and commercial sectors as well as policies, programmes and technologies. This continuous inspection is laid out in the first and the third part of the Yearbook, with the first providing the description and analysis and the latter data and chronology. These two parts are prepared in-house by ESPI.

The second part of the Yearbook again brings in the views of ten distinguished analysts in the field of space policy touching topics or events which stirred the space sector between mid-2008 and mid-2009. Of course, the two mega-trends outlined above are covered by specific contributions, but new types of programmes (like the integrated applications) or regulatory issues of particular timeliness and relevance (like national space legislation) are discussed as well. This Yearbook also contains in its second part more contributions from abroad Europe than ever before. Scholars from the U.S., Canada and India have accepted to share their analyses of particularly important issues like the expectations in the new U.S. administration's space policy making. This multitude of issues and views has by now also become a trademark of the Yearbook, enhancing an intellectual dialogue between Europe and abroad. This dialogue was not a virtual one, since an authors' conference in the framework of ESPI's Autumn Conference of its European Space Policy Research and Academic Network (ESPRAN) in September 2009 provided for an extensive in-depth exchange of ideas and views on the draft manuscripts. This served as an efficient instrument for attuning the contributions to this edition.

The ten contributors of the articles for part 2 are also the persons ESPI would like to thank in a particular way for their engagement in this project. In addition to that, the editorial team is indebted to the members of the Advisory Council of the Institute, chaired by Herbert Allgeier, which in this composition acts as the Editorial Advisory Board to the Yearbook series. Thanks are also due to Wendelin Pohl for his zestful support.

Kai-Uwe Schrogl, Wolfgang Rathgeber, Blandina Baranes, Christophe Venet
ESPI editorial team

Table of contents

List of acronyms	xv
----------------------------	----

PART 1 **The Year in Space 2008/2009**

Chapter 1. European space activities in the global context. *Wolfgang Rathgeber and Christophe Venet*

1. Global political and economic trends	2
1.1. Global economic outlook	2
1.2. Political developments.	3
1.2.1. Security	4
1.2.2. Environment	6
1.2.3. Energy	8
1.2.4. Resources	9
1.2.5. Knowledge	11
1.2.6. Mobility	12
1.3. Main science and technology indicators relevant for space activities.	14
1.3.1. Science and technology inputs	14
1.3.2. Science and technology outputs.	16
2. Worldwide space policies and strategies	17
2.1. The United Nations system.	17
2.1.1. United Nations General Assembly (UNGA)	18
2.1.2. UNGA Committees	18
2.1.3. Other UN bodies and organs monitoring outer space activities	20
2.2. The Group on Earth Observation	22
2.3. Regional cooperation in space activities	22
2.4. Europe.	24
2.4.1. European Space Agency	24
2.4.2. European Union	26
2.4.3. Other European institutions	29
2.4.4. EUMETSAT	30

2.4.5.	National governments	31
2.4.5.1.	France	31
2.4.5.2.	Germany	33
2.4.5.3.	Italy	34
2.4.5.4.	The United Kingdom	35
2.5.	The United States.	36
2.6.	Russia	38
2.7.	Japan	39
2.8.	China	40
2.9.	India	41
2.10.	Emerging space powers.	42
3.	Worldwide space budgets and revenues.	44
3.1.	Overview of institutional space budgets	44
3.2.	Overview of commercial space markets.	46
3.3.	Evolution of the space industry	49
3.3.1.	Industrial evolutions in Europe	49
3.3.2.	Industrial evolutions in the United States	52
3.3.3.	Industrial evolutions in Russia	54
3.3.4.	Industrial evolutions in Japan	55
3.3.5.	Industrial evolutions in China.	55
3.4.	Industrial overview	56
3.4.1.	Launch sector	57
3.4.2.	Satellite manufacturing sector	60
3.4.3.	Satellite operators sector	63
4.	The security dimension	64
4.1.	The global space military context.	64
4.2.	Europe.	66
4.2.1.	National initiatives	67
4.2.2.	European Union level.	69
4.2.2.1.	Council/Space Council	70
4.2.2.2.	European Commission	71
4.2.2.3.	Agencies.	71
4.2.2.4.	European Parliament.	72
4.2.3.	European Space Agency.	72
4.2.4.	Other European institutions	73
4.3.	The United States.	74
4.4.	Russia	77
4.5.	Japan	78
4.6.	China	79
4.7.	India	80

4.8. Other selected space actors	81
4.9. Threats to the space environment	82

Chapter 2. Developments in space policies, programmes and technologies throughout the world and in Europe.

Wolfgang Rathgeber and Christophe Venet

1. Space policies and programmes	99
1.1. Highlights in policies and programmes	99
1.2. Highlights in partnerships	100
2. Space transportation	103
2.1. Europe	104
2.2. United States	105
2.3. Russia	107
2.4. Japan	108
2.5. China	109
2.6. India	109
2.7. Emerging actors	110
2.8. Industrial comparison	111
3. Space sciences and exploration	114
3.1. Human spaceflight activities	115
3.2. Lunar exploration	117
3.3. Mars exploration	119
3.4. Saturn exploration	120
3.5. Venus exploration	121
3.6. Mercury exploration	121
3.7. Jupiter exploration	122
3.8. Solar observation	122
3.9. Outer solar system exploration and observation	123
3.10. International cooperation in space exploration	124
4. Satellite applications	125
4.1. Space-based communications	125
4.2. Space-based positioning, navigation and timing systems	130
4.3. Space-based Earth observation	135
5. Technology developments	139
5.1. Propulsion	139
5.2. Information technology	140
5.3. Spacecraft operations and design	140
5.4. Suborbital activities	141

5.5. Other technologies	143
5.6. Innovation policy	143

PART 2

Views and Insights

1. The new geostrategic context for space and the positioning of Europe. <i>Bertrand de Montluc</i>	154
1.1. A new strategic context for space policies	154
1.2. International security and space capabilities	155
1.3. A geostrategic approach to understanding space policies	156
1.4. The position of Europe	158
1.5. Europe’s role in the global context	159
1.6. Conclusion	160
2. Forecasting the consequences of the “Crash of 2008” on space activities. <i>Walter Peeters</i>	164
2.1. Introduction	164
2.2. Macroeconomic effects on space activities	167
2.2.1. Space and GDP	167
2.2.2. Effects of the present financial crisis	169
2.2.3. Forecasting space expenditure on the basis of GDP	170
2.3. Microeconomic effects	173
2.3.1. Workforce effects	173
2.3.1.1. Higher demand for definite term contracts	173
2.3.1.2. Higher demand for multidisciplinary workforce	173
2.3.2. Financing of space projects	174
2.3.3. Increased vigilance against cost overruns	175
2.4. Conclusion	177
3. Space as a strategic policy area for Europe and the European Union. <i>Jürgen Turek</i>	179
3.1. Space as a strategic policy for Europe	179
3.2. Europe’s need for a space policy and the new European space politics	182
3.3. Capabilities to act in space in the 21 st century	184
3.4. Trying something completely new?	186
4. GMES – Status review and policy developments. <i>Josef Aschbacher and Maria P. Milagro Pérez</i>	188

4.1.	Background	188
4.1.1.	GMES brief history	188
4.1.2.	GMES components	190
4.1.3.	Funding strategy	190
4.2.	GMES services serving EU policies	191
4.2.1.	GMES services	191
4.2.1.1.	Marine services	192
4.2.1.2.	Land services	193
4.2.1.3.	Atmospheric services	193
4.2.1.4.	Emergency response services	193
4.2.1.5.	Security services	194
4.2.1.6.	Climate change services	194
4.2.2.	Governance of GMES	194
4.2.2.1.	Space Council	195
4.2.2.2.	GMES Advisory Council	196
4.2.2.3.	ESA Council and Sub-ordinate Bodies.	196
4.2.2.4.	EU FP7 Programme Committee	196
4.2.2.5.	The EC-ESA Agreement on the GMES Space Component	196
4.2.2.6.	The EC GMES Bureau and ESA GMES Space Office	197
4.3.	Challenges of today's governance	197
4.4.	GMES Space Component	198
4.4.1.	GMES satellites	199
4.4.1.1.	Synthetic Aperture Radar missions	199
4.4.1.2.	Optical missions	200
4.4.1.3.	Global land and ocean missions including altimetry	201
4.4.1.4.	Atmospheric Missions	202
4.5.	Sentinel Data Policy	203
4.5.1.	Other space data policies	204
4.6.	Key issues on GMES and lessons learned	206
5.	Integrated applications: a new way forward for Europe – Some legal thoughts. <i>Frans G. von der Dunk</i>	208
5.1.	Europe and the integration of Earth observation, telecommunications and navigation	208
5.2.	The ESA legal framework and integrated space applications	209
5.3.	The European Union legal framework and integrated space applications	212

5.4.	External legal parameters: the ITU framework and the UN space treaties	215
5.5.	Concluding remarks	218
6.	The past and future of security-related satellite missions in Europe. <i>Sascha Lange</i>	223
6.1.	Dual use	224
6.2.	National programmes of European States.	225
6.2.1.	Reconnaissance	225
6.2.1.1.	SAR-Lupe	226
6.2.1.2.	COSMO-Skymed.	226
6.2.1.3.	SPOT	226
6.2.1.4.	Helios	227
6.2.1.5.	RapidEye	227
6.2.1.6.	PLEIADES	227
6.2.1.7.	INGENIO/PAZ/SEOSAT.	227
6.2.1.8.	SPIRALE	228
6.2.1.9.	ESSAIM	228
6.2.2.	Communication.	228
6.2.2.1.	Skynet	229
6.2.2.2.	SYRACUSE.	229
6.2.2.3.	SICRAL	229
6.2.2.4.	SatComBW	229
6.2.2.5.	XTAR	229
6.3.	Cooperation between ESA and EUMETSAT in Earth observation.	230
6.3.1.	Meteosat	230
6.4.	ESA programmes	230
6.4.1.	ERS 1 and 2	231
6.4.2.	ENVISAT	231
6.4.3.	GOCE	231
6.4.4.	SMOS	231
6.4.5.	CryoSat2.	232
6.4.6.	ADM/Aeolus	232
6.4.7.	SWARM	232
6.4.8.	EarthCare	232
6.5.	Cooperation between ESA and EU/EC on Earth observation.	233
6.5.1.	Global Monitoring for Environment and Security (GMES).	233
6.5.1.1.	Sentinel-1.	233

6.5.1.2.	Sentinel-2	233
6.5.1.3.	Sentinel-3	234
6.5.1.4.	Sentinel-4 and -5	234
6.6.	Navigation	234
6.6.1.	Galileo	234
6.7.	Financial threats?	235
6.8.	Outlook – complementary strengths.	235
7.	Latest trends in the national authorisation and regulation of space activities in Europe. <i>Irmgard Marboe and Florian Hafner</i>	237
7.1.	Introduction	237
7.2.	Is there a need for national space legislation?	238
7.3.	Latest trends in the national authorisation and regulation of space activities in Europe	238
7.3.1.	Belgium	239
7.3.2.	The Netherlands	239
7.3.3.	France.	240
7.4.	The contents of the authorisation regimes	241
7.4.1.	Who authorises?	241
7.4.2.	What kind of activities require authorisation?.	242
7.4.3.	What are the conditions?	243
7.4.3.1.	How is compliance controlled?.	245
7.5.	European perspective	245
7.6.	Latest trends from the Legal Subcommittee: The working group on national legislation relevant to the peaceful exploration and use of outer space	247
7.7.	Conclusion.	249
8.	Iridium-Cosmos collision and its implications for space operations. <i>Ram S. Jakhu</i>	254
8.1.	Introduction	254
8.2.	Determination of liability for damage.	255
8.3.	Consequences and implications of the collision.	259
8.3.1.	Regulatory uncertainty	259
8.3.2.	Increasing risks and cost of space operations	260
8.4.	Efforts to keep space for safe and sustainable development and use	265
8.4.1.	Prevention: debris mitigation regulatory measures	265
8.4.2.	Prevention: space situational awareness and space traffic management.	266
8.4.3.	Cure: removal of space debris	269
8.5.	Conclusion – message	270

9.	The Space Policy of the New U.S. Administration. <i>Scott Pace</i>	276
9.1.	Introduction	276
9.2.	Civil Space Policy	277
9.3.	National security space policy	281
9.4.	Looking Ahead	283
10.	China's space programme and Asia. <i>Srikanth Kondapalli</i>	286
10.1.	Introduction	286
10.2.	Satellites	288
10.3.	Launchers	289
10.4.	Shenzhou 7 spacecraft	289
10.5.	Lunar mission	290
10.6.	Space station	291
10.7.	Impact on Asia	291
10.7.1.	Japan	291
10.7.2.	South Korea	292
10.7.3.	North Korea	292
10.7.4.	India	293
10.7.5.	Iran	294
10.8.	Conclusions	294

PART 3
Facts and Figures

Christophe Venet

1.	Chronology: July 2008–June 2009	302
1.1.	Access to space	302
1.2.	Space science and exploration	306
1.3.	Applications	308
1.4.	Policy and international cooperation	312
2.	Country profiles	314
3.	Bibliography of space policy publications July 2008–June 2009	339
3.1.	Monographs	339
3.2.	Articles	341
	List of figures and tables	346
	About the authors	349
	Index	356

List of acronyms

3D: 3 Dimensions

3DTV: 3 Dimensions Television

A

AATSR: Advanced Along Track Scanning Radiometer

ACI: Airports Council International

ADF: Australian Defence Force

ADM: Atmospheric Dynamics Mission

AEHS: Advanced Extremely High Frequency Satellite

AFRL: Air Force Research Laboratory

AIS: Automatic Identification System

ALC: African Leadership Conference on Space Science and Technology for Sustainable Development

ALOS: Advanced Land Observing Satellite

APRSAF: Asia-Pacific Regional Space Agency Forum

APSCO: Asia-Pacific Space Cooperation Organisation

ARATS: Association for Relations Across the Taiwan Straits

ARMC: African Resource Management and Environmental Constellation

ARTA: Ariane 5 Research and Technology Accompaniment Programme

ARTES: Advanced Research in Telecommunications Systems

AR5: 5th Assessment Report

ARV: Advanced Re-entry Vehicle

ASAL: Agence Spatiale Algérienne (Algerian Space Agency)

ASAT: Anti-Satellite

ASI: Agenzia Spaziale Italiana (Italian Space Agency)

ATM: Air Traffic Management

ATV: Automated Transfer Vehicle

AU: African Union

AVIC: Aviation Industries of China

B

BAE: British Aerospace

BGAN: Broadband Global Area Network

BLS: Boeing Launch Services

BNSC: British National Space Centre

BRIC: Brazil Russia India China

C

C4ISR: Computerised Command, Control, Communications, Intelligence, Surveillance, Reconnaissance

CALT: China Academy of Launch Vehicle Technology

CASA: Construcciones Aeronáuticas Sociedad Anónima

CASC: China Aerospace Corporation

CASTC: China Aerospace Science and Technology Corporation

CBERS: China Brazil Earth Resources Satellites

CD: Conference on Disarmament

CDR: Critical Design Review

CEA: Commissariat à l'Énergie Atomique (French Atomic Energy Commissariat)

CEO: Chief Executive Officer

CEOS: Committee on Earth Observation Satellites

CFE: Commercial and Foreign Entities

CFSP: Common Foreign and Security Policy

CGEA: Community General Export Authorization

CGWIC: China Great Wall Industry Corporation

CHAMP: Challenging Mini-Satellite Payload

CIP: Competitiveness and Innovation Framework Programme

CMA: China Meteorological Administration

CMSEO: China Manned Space Engineering Office

CNES: Centre National d'Études Spatiales (French Space Agency)

CNNC: China National Nuclear Corporation

CNSA: China National Space Administration

CoC: Code of Conduct

COF: Columbus Orbital Facility

COFUR: Cost Of Fulfilling User Requests

COPUOS: Committee on the Peaceful Uses of Outer Space

CoReH₂O: Cold Regions Hydrology High-resolution Observatory

CORONAS: Complex ORbital Observations Near-Earth of Activity of the Sun

COSMO-Skymed: Constellation of small Satellites for the Mediterranean basin Observation

COSTIND: Commission for Science, Technology and Industry

COTS: Commercial Orbital Transportation Services

CSA: Canadian Space Agency

CSIS: Center for Strategic and International Studies

CSSC: China State Shipbuilding Corporation

D

DARPA: Defense Advanced Research Projects Agency

DBS: Direct Broadcast Services

DGA: Direction Générale de l'Armement (French Military Procurement Agency)

DHS: Department for Homeland Security

DLR: Deutsches Zentrum für Luft- und Raumfahrt (German Space Agency)

DMO: Defence Material Organisation

DMSF: Defense Meteorological Satellite Program

DOC: Department of Commerce

DoD: Department of Defense

DOR: Differential One-way Range

DRC: Democratic Republic of Congo

DSP: Defense Support Program

DSTO: Defence Science and Technology Organisation

DTH: Direct-to-Home

E

EADS: European Aeronautic Defence and Space Company

EarthCARE: Earth Clouds, Aerosol and Radiation Explorer

EC: European Commission

ECA: Evolution Cryotechnique Type A

ECB: European Central Bank

e-CORCE: e-Constellation of Observation by Recurrent Cellular Environment

EDA: European Defence Agency

EDEM: European Defence Equipment Market

EDRS: European Data Relay Satellite

EEA: European Environment Agency

EELV: Evolved Expandable Launch Vehicle

EERP: European Economic Recovery Plan

EGB: EUROBOT Ground Prototype

EGNOS: European Geostationary Navigation Overlay Service

EISC: European Interparliamentary Space Conference

EJSM: Europa Jupiter System Mission

ELINT: Electronic signals Intelligence

eLORAN: enhanced LOng RANGE Navigation
ELV: Expandable Launch Vehicle
EMS: Electromagnetic Sciences
EnMAP: Environmental Mapping and Analysis Programme
EO: Earth Observation
EPS: EUMETSAT Polar System
ERA: European Research Area
ERC: European Research Council
ERS: European Remote Sensing Satellite
ESA: European Space Agency
ESDP: European Security and Defence Policy
ESP: European Space Policy
ESPI: European Space Policy Institute
ESTRACK: ESA Tracking Network
EU: European Union
EUFOR: European Union Force
EULEX: European Union Rule of Law Mission in Kosovo
EUMETSAT: European Organisation for the Exploitation of Meteorological Satellites
EU NAVFOR: European Union Naval Force Somalia
EUSC: European Union Satellite Centre
EVA: Extravehicular Activity

F

FAA: Federal Aviation Administration
FAO: Food and Agricultural Organisation
FBI: Federal Bureau of Investigations
FCC: Federal Communications Commission
FLPP: Future Launcher Preparatory Programme
FOC: Full Operational Capability
FP7: Framework Programme for research and technological development 7
FSS: Fixed Satellite Services
FY: Fiscal Year
FY: Feng Yung

G

GAC: GMES Advisory Council
GAD: General Armaments Department
GAGAN: GPS-Aided Geosynchronous Augmented Navigation System
GAO: Government Accountability Office

GBAORD: Government Budget Appropriations or Outlay on R&D
GCM: GMES Contributing Missions
GDP: Gross Domestic Product
GEMS: Gravity and Extreme Magnetism Small Explorer
GEO: Geostationary Orbit
GEO: Group on Earth Observations
GEOSS: Global Earth Observation System of Systems
GERD: Gross Domestic Expenditure on R&D
GES: Global Exploration Strategy
GES: Growth Environment Score
GIANUS: Global Integrated Architecture for iNnovative Utilisation of space for Security
GIO: GMES Initial Operations
GIOVE: Galileo In-Orbit Validation Element
GIP: Galileo Interinstitutional Panel
GIS: Geographic Information System
GJU: Galileo Joint Undertaking
GLONASS: Global Navigation Satellite System
GMES: Global Monitoring for Environment and Security
G-MOSAIC: GMES services for Management of Operations, Situation Awareness and Intelligence for regional Crises
GMSK: Gaussian Minimum Shift Keying
GOCE: Gravity field and steady-state Ocean Circulation Explorer
GOES: Geostationary Operational Environmental Satellite
GOSAT: Greenhouse Gases Observing Satellite
GPS: Global Positioning System
GSA: GNSS Supervisory Authority
GSC: GMES Space Component
GSC: Guyana Space Centre
GSLV: Geosynchronous Satellite Launch Vehicle
GTO: Geostationary Transfer Orbit
G8: Group of Eight
G20: Group of Twenty

H

HDTV: High Definition Television
HR: High Resolution
HSPG: High-Level Space Policy Group
HTV: H-2 Transfer Vehicle

I

IAASS: International Association for the Advancement of Space Safety
IADC: Inter-Agency Space Debris Coordination Committee
IAEA: International Atomic Energy Agency
IBEX: Interstellar Boundary Explorer
ICAO: International Civil Aviation Organization
ICBM: Intercontinental Ballistic Missile
ICG: International Committee on Global Navigation Satellite Systems
ICT: Information and Communication Technologies
IEA: International Energy Agency
IFAD: International Fund for Agricultural Development
IGN: Institut Géographique National (French National Geographic Institute)
IGS: Integrated Geo Systems
IGT: Innovation Growth Team for Space
IGY: International Geophysical Year
IHY: International Heliophysical Year
ILS: International Launch Services
IMF: International Monetary Fund
IMINT: Imagery Intelligence
IMO: International Maritime Organisation
INMARSAT: International Maritime Satellite Organisation
INSPIRE: Infrastructure for Spatial Information in Europe
IOV: In-Orbit Validation
IP: Internet Protocol
IPCC: Intergovernmental Panel on Climate Change
IRIS: Interface Region Imaging Spectrograph
ISA: Israeli Space Agency
ISAF: International Security Assistance Force
ISC: International Space Company
ISECG: International Space Exploration Coordination Group
ISRO: Indian Space Research Organisation
ISS: International Space Station
ITAR: International Traffic in Arms Regulations
ITU: International Telecommunication Union
IXO: International X-Ray Observatory

J

JAPCC: Joint Air Power Competence Center
JAXA: Japan Aerospace Exploration Agency

JEM: Japanese Experiment Module

JMA: Japan Meteorological Agency

K

KEW: Kinetic Energy Weapon

KMA: Korea Meteorological Administration

KSLV: Korea Space Launch Vehicle

KT: Kaitouzhe

L

LaRa: Lander Radio-Science

LCD: Liquid Crystal Display

LCROSS: Lunar CRater Observing and Sensing Satellite

LEO: Low-Earth Orbit

LEOP: Launch and Early Orbit Phase

LIMES: Land and See Monitoring for Environment and Security

LM: Long March

LMCLS: Lockheed Martin Commercial Launch Services

LRO: Lunar Reconnaissance Orbiter

LWS: Living With a Star

M

MACC: Monitoring Atmospheric Composition and Climate

MAI: Moscow Aviation Institute

MAVEN: Mars Atmosphere and Volatile Evolution

MDA: Missile Defense Agency

MDG: Millennium Development Goals

MEJI: Mars Exploration Joint Initiative

MELiSSA: Micro-Ecological Life Support System Alternative

MEO: Medium Earth Orbit

MERIS: Medium Resolution Imaging Spectrometer

MHI: Mitsubishi Heavy Industries

MoD: Ministry of Defence

MONUC: Mission de l'Organisation des Nations Unies en République démocratique du Congo (UN Mission in the Democratic Republic of the Congo)

MoonLITE: Moon Lightweight Interior and Telecom Experiment

MoU: Memorandum of Understanding

MPA: Maritime Patrol Aircraft

MPLM: Multipurpose Laboratory Module

MR: Medium Resolution

MRM: Mini Research Module
MRO: Mars Reconnaissance Orbiter
MSAS: MTSAT Satellite-Based Augmentation System
MSC: Meteorological Service of Canada
MSG: Meteosat Second Generation
MSI: Multi-Spectral Imager
MSL: Mars Science Laboratory
MSS: Mobile Satellite Services
MSV: Mobile Satellite Ventures
MTCR: Missile Technology Control Regime
MTG: Meteosat Third Generation
MTI: Moving Target Indicator
MUOS: Mobile User Objective System
MUSIS: Multinational Satellite-based Imagery System

N

NAO: National Applications Office
NASA: National Aeronautics and Space Administration
NASDA: National Development Space Agency of Japan
NATO: North Atlantic Treaty Organisation
NBO: Network-Based Operations
NDPG: National Defence Program Guidelines
NEO: Near-Earth Objects
NERC: Natural Environment Research Council
NEREUS: Network of European Regions Using Space Technologies
NFIRE: Near Field Infrared Experiment
NGDI: National Geospatial Data Infrastructure
NGO: Non-governmental Organisation
NGST: New Generation Space Telescope
NOAA: National Oceanic and Atmospheric Administration
NORAD: North American Aerospace Defense Command
NPOESS: National Polar-orbiting Operational Environmental Satellite System
NRO: National Reconnaissance Office
NSSA: National Security Space Authority

O

OECD: Organisation for Economic Co-operation and Development
OHB: Orbitale Hochtechnologie Bremen
OLCI: Ocean Land Colour Instrument

OPEC: Organisation of Petroleum Exporting Countries
ORFEO: Optical and Radar Federated Earth Observation
ORS: Operationally Responsive Space
OSTM: Ocean Surface Topography Mission

P

PBEO: Programme Board for Earth Observation
PCT: Patent Cooperation Treaty
PDR: Preliminary Design Review
PFI: Public Financing Initiative
PLA: People's Liberation Army
PNT: Positioning, Navigation and Timing
POES: Polar Operational Environment Satellites
PPP: Public Private Partnership
PREMIER: Process Exploration through Measurement of Infrared Emitted Radiation
PRS: Public-Regulated Service
PSA: Programme on Space Applications
PSLV: Polar Satellite Launch Vehicle

Q

QDR: Quadrennial Defense Review

R

R&D: Research & Development
RCA: République Centrafricaine
RISAT: Radar Imaging Satellite
RLV-TD: Reusable Launch Vehicle Technology Demonstrator
RSCC: Russian Satellite Communications Company
RTD: Research and Technology Development

S

SA: Société Anonyme (Public Limited Company)
SAFER: Services and Applications for Emergency Responses
SALMON: Stand Alone Mission of Opportunity
SAR: Synthetic Aperture Radar
SAOCOM: Satellite de Observation y Comunicacion (Observation and Communications Satellite)

SBSS: Space-Based Surveillance System
SDA: Satellite Data Association
SDCM: System of Differential Corrections and Monitoring
SDI: Strategic Defense Initiative
SDO: Solar Dynamics Observatory
SDSTB: State Defense Science and Technology Bureau
SEF: Straits Exchange Foundation
SELENE: SELenological and ENgineering Explorer
SES: Single European Sky
SES: Société Européenne des Satellites
SHF: Super High Frequency
SHSP: Strategic Headquarters for Space Policy
SIA: Satellite Industry Association
SIASGE: Sistema Italo Argentina de Satelites para la Gestion de Emergencias (Italian-Argentinian Satellite System for Emergency Management)
SICRAL: Sistema Italiano per Comunicazioni Riservate ed Allarmi (Italian Military Communications System)
SIGINT: Signals Intelligence
SIPRI: Stockholm International Peace Research Institute
SLSTR: Sea Land Surface Temperature Radiometer
SMC: Space and Missile Systems Center
SMDC: Space and Missile Defense Command
SME: Small and Medium Enterprise
SMEX: Small Explorer
SMOS: Soil Moisture and Ocean Salinity
SMP: Systèmes Midi-Pyrénées
SNC: Sierra Nevada Corporation
SOHO: Solar and Heliospheric Observatory
SPOT: Satellite pour l'Observation de la Terre (Earth Observation Satellite)
SPS PS: Standard Positioning Service Performance Specification
SS2: Space Ship 2
SSA: Space Situational Awareness
SSC: Swedish Space Corporation
SSL: Space Systems/Loral
SSN: Space Surveillance Network
SSOT: Sistema Satelital para Observacion de la Tierra (Satellite System for EO)
SSTL: Surrey Satellite Technology Ltd.
S&T: Science and Technology
STAR: Satellite Technology for the Asia-Pacific Region
START: Strategic Arms Reduction Treaty

STERO: Solar TERrestrial RELations Observatory
STFC: Science and Technology Facilities Council
STSS: Space Tracking Surveillance System
SWIR: Shortwave Infrared

T

TCBM: Transparency and Confidence Building Measures
THEO: Thai Earth Observation System
TIP: Tender Information Package
TSAT: Transformation Communications Satellite
TSB: Technology Strategy Board
TSSM: Titan Saturn System Mission
TV: Television

U

UAE: United Arab Emirates
UHF: Ultra High Frequency
UK: United Kingdom
ULA: United Launch Alliances
UN: United Nations
UNCCC: United Nations Climate Change Conference
UNEP: United Nations Environment Programme
UNESCO: United Nations Educational, Scientific and Cultural Organization
UNFCCC: United Nations Framework Convention on Climate Change
UNGA: United Nations General Assembly
UNGIWG: United Nations Geographic Information Working Group
UNIDIR: United Nations Institute for Disarmament Research
UNISPACE: United Nations Conference on the Exploration and Peaceful Uses of Outer Space
UNOOSA: United Nations Office for Outer Space Affairs
UNSC: United Nations Security Council
UNSDI: United Nations Spatial Data Infrastructure
UN-SPIDER: UN Platform for Space-based Information for Disaster Management and Emergency Response
US: United States
USAF: United States Air Force
USGS: United States Geological Survey
USN: Universal Space Network
USSTRATCOM: United States Strategic Command
UV: Ultraviolet

V

VC: Venture Capital

VERTA: Vega Research and Technology Accompaniment

VHR: Very High Resolution

VN: Vereinte Nationen (United Nations)

VNIR: Visible and Near Infrared

W

WEU: Western European Union

WFP: World Food Programme

WGS: Wideband Global Satcom

WHO: World Health Organisation

WIPO: World Intellectual Property Organisation

WK2: White Knight 2

WRS: World Radiocommunication Seminar

WTSA: World Telecommunication Standardisation Assembly