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# Yearbook on Space Policy

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# Yearbook on Space Policy 2009/2010

Space for Society

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# Preface

The financial and economic crisis is still an issue of great concern for the global space sector. While space activities fared quite well during the first year of the crisis, effects on public programmes and commercial activities might still become more visible in the future, when public budgets have to be confirmed and when investment cycles in the private sector are completed. So far, however, the governments as well as the companies in the sector have kept to their promises and have been able to even modestly increase their business. This shows that space is regarded on the governmental level as a strategic asset and that it has generated a robust market, which through its services in telecommunications, direct broadcasting, navigation and Earth observation still has a huge potential that can be even further tapped during a situation like the global crisis. Europe is well positioned in this context, but the largest dynamic can be seen in emerging countries, which are partners, markets and competitors at the same time. But so far, growth in the space sector has allowed for beneficial international cooperation and joint economic growth. Europe is taking strong efforts in further developing its internal structures for governing space activities efficiently and seeing a competitive industrial base with manufacturers, operators and service providers grow.

One remarkable event in the timeframe that is covered by the Yearbook – the period from July 2009 to June 2010 – has been the issuing of a new U.S. Space Policy. A rare expression of a comprehensive approach to all space activities, this document has become the point for extended analysis. While it contains remarkable statements and also changes from the last document of its kind, its impact will have to be seen only in the future. More immediate impacts and concrete effects had a number of policy discussions and events, which all are related to one of the largest issue areas for space applications: natural disasters, where space plays a crucial role in their mitigation and related global discussions, as the Summit in Copenhagen, epitomising the problem of climate change. Through this, space received a large visibility and demonstrated its impact. It is for this reason that the thematic title of this Yearbook reflects on “Space for Society”, since the application issues – not only for disaster management but also for other areas such as telecommunications, navigation and Earth observation – are highlighted throughout this volume.

As usual, the Yearbook on Space Policy comprises three parts. The first part shows an overview on the global space endeavours. It is prepared in-house in ESPI and it contains the whole spectrum of actors, issues, policies and economic

developments. While its perspective is European, it provides an analytical whole of space around the world. The second part again contains contributions from highly distinguished experts in the field. We have been able to assemble personalities mainly from the academic sector, adding also views from agencies and users. Issues which are covered have been highlights during the period of mid 2009 to mid 2010, of course reflecting on the new U.S. Space Policy and the Copenhagen summit, but also highlighting important European issues, like Galileo or the Lisbon Treaty, and in addition looking into international relations and benefits from space activities for societies world-wide. For this purpose, we have again invited contributors from within and outside Europe, thus showing that the network established by ESPI, the European Space Policy Research and Academic Network (ESPRAN) is getting more and more global. The third part of the Yearbook maintains the additional character of the Yearbook as an archive for space activities. Again prepared in-house in ESPI, a chronology, a bibliography and data about institutions is provided, where readers of the now four volumes of the Yearbook can identify statistical developments and trends.

An important milestone in the preparation of the Yearbook was again ESPI's Autumn Conference, where the authors met for an exchange on drafts of their contributions. Having taken place in Vienna in September 2010 and sponsored by the German Aerospace Center DLR, it provided the forum for a constructive exchange and coordination of the contributions. We appreciated very much the excellent discussion culture at that meeting, which led to new insights and shared analyses. The discussions at the Autumn Conference were additionally supported by members of ESPI's Advisory Council (its Chairman Herbert Allgeier and its member Alfredo Roma), which also acts as the Editorial Advisory Board to ESPI's book series and the Chairman of its General Assembly (Harald Posch). Thanks also go to Johannes Pseiner, Conor Francois and Renaud Abram.

*Kai-Uwe Schrogl, Spyros Pagkratis, Blandina Baranes*  
ESPI Editorial Team

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# List of acronyms

## 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  
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: 5<sup>th</sup> Assessment Report  
ASAT: Anti Satellite  
ASI: Agenzia Spaziale Italiana (Italian Space Agency)  
ATM: Air Traffic Management  
ATV: Automated Transfer Vehicle  
AVIC: Aviation Industries of China

## B

BAE: British Aerospace  
BGAN: Broadband Global Area Network  
BRIC: Brazil Russia India China

## C

CALT: China Academy of Launch Vehicle Technology  
CASC: China Aerospace Corporation  
CASTC: China Aerospace Science and Technology Corporation  
CEO: Chief Executive Officer  
CEOS: Committee on Earth Observation Satellites  
CFSP: Common Foreign and Security Policy  
CGWIC: China Great Wall Industry Corporation

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  
COF: Columbus Orbital Facility  
COFUR: Cost Of Fulfilling User Requests  
COPUOS: Committee on the Peaceful Uses of Outer Space  
COSMO-Skymed: Constellation of small Satellites for the Mediterranean basin Observation  
COTS: Commercial Orbital Transportation Services  
CSA: Canadian Space Agency

## **D**

DARPA: Defence Advanced Research Projects Agency  
DBS: Direct Broadcast Services  
DLR: Deutsches Zentrum für Luft- und Raumfahrt (German Space Agency)  
DMSP: Defence Meteorological Satellite Program  
DOC: Department of Commerce  
DoD: Department of Defence  
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  
ECB: European Central Bank  
e-CORCE: e-Constellation of Observation by Recurrent Cellular Environment  
EDA: European Defence Agency  
EDRS: European Data Relay Satellite  
EELV: Evolved Expandable Launch Vehicle  
EERP: European Economic Recovery Plan  
EGNOS: European Geostationary Navigation Overlay Service  
EISC: European Interparliamentary Space Conference  
EJSM: Europa Jupiter System Mission  
ELINT: Electronic signals Intelligence  
ELV: Expandable Launch Vehicle  
EMS: Electromagnetic Sciences  
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  
EU: European Union  
EUMETSAT: European Organisation for the Exploitation  
of Meteorological Satellites  
EUSC: European Union Satellite Centre  
EVA: Extravehicular Activity

**F**

FAA: Federal Aviation Administration  
FAO: Food and Agricultural Organisation  
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

**G**

GAC: GMES Advisory Council  
GAD: General Armaments Department  
GAGAN: GPS-Aided Geosynchronous Augmented Navigation System  
GAO: Government Accountability Office  
GCM: GMES Contributing Missions  
GDP: Gross Domestic Product  
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  
GIANUS: Global Integrated Architecture for iNnovative Utilisation  
of space for Security  
GIO: GMES Initial Operations  
GIOVE: Galileo In-Orbit Validation Element

GIP: Galileo Inter-institutional 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  
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

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  
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**

JAXA: Japan Aerospace Exploration Agency  
JEM: Japanese Experiment Module

## **K**

KSLV: Korea Space Launch Vehicle

## **L**

LEO: Low Earth Orbit  
LM: Long March  
LMCLS: Lockheed Martin Commercial Launch Services  
LRO: Lunar Reconnaissance Orbiter

## **M**

MDA: Missile Defence Agency  
MDG: Millennium Development Goals  
MEJI: Mars Exploration Joint Initiative  
MEO: Medium Earth Orbit  
MERIS: Medium Resolution Imaging Spectrometer  
MHI: Mitsubishi Heavy Industries  
MoD: Ministry of Defence  
MoU: Memorandum of Understanding

MPLM: Multipurpose Laboratory Module  
MR: Medium Resolution  
MSG: Meteosat Second Generation  
MSI: Multi-Spectral Imager  
MSL: Mars Science Laboratory  
MSS: Mobile Satellite Services  
MSV: Mobile Satellite Venture  
MTCR: Missile Technology Control Regime  
MTG: Meteosat Third Generation  
MUOS: Mobile User Objective System  
MUSIS: Multinational Satellite-based Imagery System

## **N**

NASA: National Aeronautics and Space Administration  
NATO: North Atlantic Treaty Organisation  
NEO: Near-Earth Objects  
NGO: Non-governmental Organisation  
NOAA: National Oceanic and Atmospheric Administration  
NORAD: North American Aerospace Defence 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  
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  
PLA: People's Liberation Army  
PNT: Positioning, Navigation and Timing  
POES: Polar Operational Environment Satellites  
PPP: Public Private Partnership  
PRS: Public-Regulated Service  
PSA: Programme on Space Applications  
PSLV: Polar Satellite Launch Vehicle

**Q**

QDR: Quadrennial Defence Review

**R**

R&D: Research & Development

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

SAFER: Services and Applications for Emergency Responses

SAR: Synthetic Aperture Radar

SBSS: Space Based Surveillance System

SDA: Satellite Data Association

SDI: Strategic Defence Initiative

SDO: Solar Dynamics Observatory

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

SICRAL: Sistema Italiano per Comunicazioni Riservate ed Allarmi

SIGINT: Signal Intelligence

SME: Small and Medium Enterprise

SMOS: Soil Moisture and Ocean Salinity

SOHO: Solar and Heliospheric Observatory

SPOT: Satellite pour l'Observation de la Terre (Earth Observation Satellite)

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

START: Strategic Arms Reduction Treaty

STSS: Space Tracking Surveillance System

## **T**

TCBM: Transparency and Confidence Building Measures

TSAT: Transformation Communications Satellite

## **U**

UAE: United Arab Emirates

UHF: Ultra High Frequency

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

USAF: United States Air Force

USGS: United States Geological Survey

USSTRATCOM: United States Strategic Command

UV: Ultraviolet

## **V**

VC: Venture Capital

VHR: Very High Resolution

VNIR: Visible and Near Infrared

## **W**

WEU: Western European Union

WFP: World Food Programme

WGS: Wideband Global Satcom

WHO: World Health Organisation

WTSA: World Telecommunication Standardisation Assembly