



Promoting Cooperative Solutions for Space Sustainability

Space and Civil Society: The Case of Secure World Foundation

Dr. Michael Simpson
Executive Director
Secure World Foundation
UNISPACE+50 Symposium
18 June 2018

Long term objective

The secure and sustainable use of the space domain.

We work toward this by.

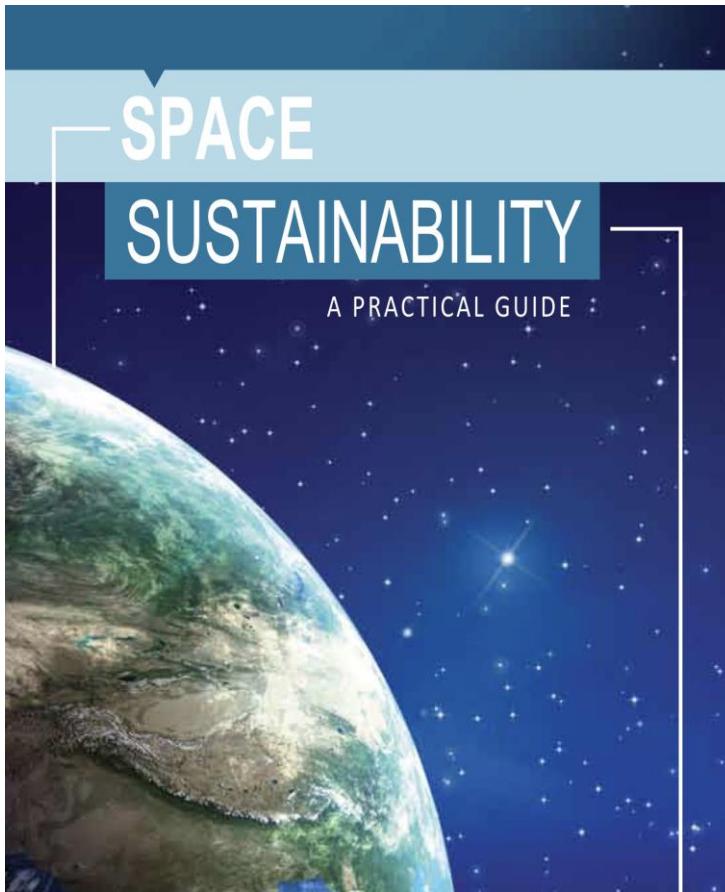
- increasing the knowledge about the space environment and the need to maintain it
- promoting international cooperation and dialogue
- helping all space actors realize the benefits that space can provide.



- Salience
- Credibility
- Competition



Space and Civil Society
UNISPACE+50 Symposium
18 June 2018



X-37B ORBITAL TEST VEHICLE FACT SHEET

Updated June 1, 2017

Main Author: Brian Weeden, bweeden@swfound.org www.swfound.org

Summary
The X-37B OTV is a technology demonstrator and experimental vehicle which is likely to be used for flight testing new reusable space launch vehicle (SLV) technologies (such as guidance and thermal protection) and on-orbit testing of new sensor technologies and satellite hardware primarily for space-based remote sensing. While it does have some capability for orbital inspection, repair, and retrieval, it is unlikely to perform these functions given its limited payload bay and altitude range. It has near zero feasibility as an orbital weapons system for attacking targets on the ground.

Background

- X-37B is an experimental re-usable space launch vehicle much smaller, completely robotic, and autonomous.
- X-37B is designed to be launched into space on orbit for months to years, and then re-enter the atmosphere.
- X-37B has thrusters for on-orbit maneuvering engines for powered flight in the air—it is not a glider.
- X-37B started life as a NASA program in 1994. DARPA transferred it to the USAF in 2004. Total program costs and budget line are classified.
- Although no official orbital parameters have been released, X-37B is believed to have an inclination of 38-43.5 degrees and an altitude of 300-400 km.
- Flight operations of the X-37B are overseen by the USAF's 45th Space Wing, Colorado Springs, Colorado.

X-37B Orbital Flight History

Launch Date	Launch Location
April 22, 2010	Cape Canaveral, FL
March 5, 2011	Cape Canaveral, FL
December 11, 2012	Cape Canaveral, FL
May 20, 2015	Cape Canaveral, FL

SPACE SITUATIONAL AWARENESS FACT SHEET

Updated May 2017

Main Author: Brian Weeden, bweeden@swfound.org www.swfound.org

Introduction

Space situational awareness (SSA) is the ability to accurately characterize the space environment and activities in space. Civil SSA combines positional information on the trajectory of objects in orbit (mainly using optical telescopes and radars) with information on space weather. Military and national security SSA applications also include characterizing objects in space, their capabilities and limitations, and potential threats.

SSA is an inherently international and cooperative venture. It requires a network of globally distributed sensors as well as data sharing between satellite owner-operators and sensor networks. SSA also forms the foundation of space sustainability as it enables safe and efficient space operations and promotes stability by reducing mishaps, misperceptions, and mistrust.

Types of SSA Sensors

Ground-based radars have historically been the backbone of SSA. Radar consists of at least one transmitter and receiver. The transmitter emits radio waves at a specific frequency, some of which reflect off the target and are measured by the receiver, which can then calculate the location of the target in relation to the radar. The primary advantages of radars are that they can actively measure the distance to a target and some types of radars can accurately track many objects at once. Some radars can also detect the motion of an object and construct a representation of its shape. The main disadvantages of radars are their cost, size, and complexity.

Optical telescopes are also widely used for SSA. Telescopes collect light or other electromagnetic (EM) radiation emitted or reflected by an object and focused into an image using lenses, mirrors, or a combination of the two. The main advantages of using optical telescopes for SSA is their ability to cover large areas quickly and, in particular, to track objects above 5,000 km (3,100 mi) altitude. Some telescopes can create high resolution images of space objects. The main disadvantage of optical telescopes is that they require specific lighting conditions and clear skies to see an object, although space-based optical telescopes eliminate some of these limitations.

Other types of sensors can be used for SSA, including sensors that detect radio frequency (RF) or other types of signals from satellites, lasers that measure the distance or range to a satellite very accurately, and infrared sensors that detect heat. Combining data from many different types of sensors, both ground- and space-based, that are also distributed around the globe provides a much more complete picture of the space environment and of activities in space.

SECURE WORLD FOUNDATION PROMOTING COOPERATIVE SOLUTIONS FOR SPACE SUSTAINABILITY

Yet again more communication



Enriching the Conversation



UNISPACE+50 High Level Forum 6-9 November 2017

And some of the most effective communication



Listening

Space and Civil Society
UNISPACE+50 Symposium
18 June 2018

Narrowing the Gap

Advocacy and Inclusion



Training Report
SRTM-2 Digital Elevation Model (DEM) Applications
 19 - 22 September 2016
 International Centre for Integrated Mountain Development (ICIMOD)
 Kathmandu, Nepal

5 October 2016



er Resolution SRTM Data & Flood Modelling
 '5 - 29 May 2015, Tonantzintla and Puebla, '1

Announcement - Save the date

ed to announce the **Higher Resolution SRTM Data d**
h focus on Latin America and the Caribbean. The
 zintla and Puebla (State of Puebla), Mexico at the
 ptica y Electrónica (INAOE) and of the Benemer



CEOS WGCapD/RCMRD DEM Workshop
 6-10 May 2013
 Nairobi, Kenya

Report



The Inaugural Committee on Earth Observation Satellites' Working Group on Capacity Building and Data Democracy (CEOS WGCapD) Digital Elevation Model (DEM) Workshop took place at RCMRD in Nairobi, Kenya, on 6-10 May 2013. The workshop was a joint effort amongst the following partners:

- Instituto Nacional de Pesquisas Espaciais (INPE)
- Regional Centre for Mapping of Resources for Development (RCMRD)
- Secure World Foundation (SWF)
- South African National Space Agency (SANSA)
- U.S. Geological Survey (USGS)
- U.S. National Oceanic and Atmospheric Administration (NOAA)

The purpose of the DEM Workshop was to build capacity in the East African region for utilizing satellite-derived digital elevation data, specifically newly released 30m elevation data gathered on the Shuttle Radar Topography Mission (SRTM), in a variety of ways, but with an emphasis on hydrological models. The final agenda can be found in the appendix of this report. The workshop included 11 participants from the following countries:

- Ethiopia
- Kenya
- Somalia

Page 1 of 7

CHAPTER 2

BROADENING THE BASE COOPERATION AS A SPRINGBOARD FOR NEW PARTICIPANTS IN THE SPACE SECTOR

MICHAEL SIMPSON, PH.D.
 THE SECURE WORLD FOUNDATION

© Michael Simpson, Ph.D., 2012. All Rights Reserved.

INTRODUCTION

Numerous examples of international cooperation among well-established spacefaring states have emerged over the last several decades. Although the prime example may be the International Space Station, other missions are similarly worthy of mention: Cassini-Huygens, Chandrayan 1, Hayabusa, and literally every mission launched by the European Space Agency. As a result of such cooperation our knowledge of our solar system, including our home planet, has been increased dramatically by missions whose success exceeded the capacity of single states, even 1

21 of 261

SWF Scholarships for IAC 2018 are Available to Young Professionals

Wednesday, June 6, 2018

Secure World Foundation is pleased to announce that we will be accepting applications from young professionals for scholarships to aid in traveling to present papers at the 2018 International Astronautical Congress (IAC), October 1-5, in Bremen, Germany.

The goal of these scholarships is to provide young space professionals an opportunity to participate in one of the most prestigious international space conferences, further their professional development, and inject new ideas into the community. Scholarships are limited to reimbursement for: 1) conference registration; 2) air or ground transportation to and from Bremen, and; 3) lodging during the IAC.

Scholarship amounts are awarded in \$500 increments between \$500 and \$1500 at the discretion of SWF.

This application is open to young professionals 35 years old or younger as of the start of the IAC, working in the space field, and who have had an abstract accepted for oral presentation at the 2018 International Astronautical Congress in Bremen. The paper must be on one of the following topics:

- Space Sustainability
- Space Law and Policy
- Human and Environmental Security

Applicants should fill out the form below with their contact and paper details as well as provide a short essay of no more than 500 words on why they feel it is important to present their research at IAC, and what they hope to get out of the experience. Individuals selected to receive scholarships will be required to provide a trip report to SWF following the Congress.

Apply Now

Deadline for Applications is 11:59 PM (EDT) Sunday, June 10, 2018.

For further questions, please contact SWF Project Manager Josh Wolny.

Last updated on June 6, 2018

Share

Site Map Terms of Use Privacy Policy GDPR



Building Capacity and Expectation



Approved by GEO-XII Plenary on 11 November 2015

The Group on Earth Observations (GEO) Mexico City Declaration

Mexico City, 13 November 2015

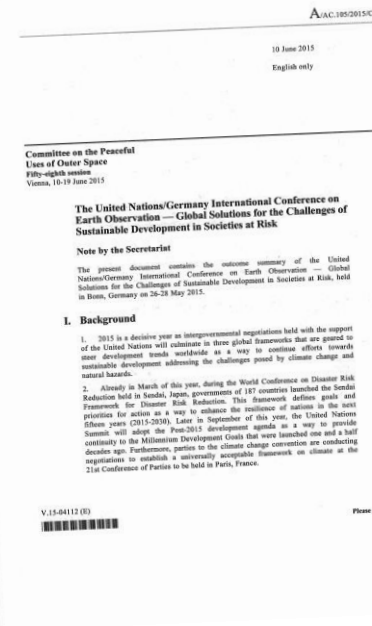
We, Ministers, GEO Members and Participants attending the Group on Earth Observations (GEO) Mexico City Ministerial Summit:

1. **Confirm** that full and open access to Earth observation data, information and knowledge is crucial for humanity as it faces unprecedented social, economic and environmental challenges at global, regional, national and local levels. **Recognize** that Earth observation data and the information and knowledge derived from those observations are fundamental for identifying and implementing solutions, monitoring progress and measuring impacts.
2. **Note** that Earth observations take many forms including in situ, remotely sensed, and space based. **Welcome** GEO's inclusion of all of these types in its efforts. **Emphasize** that Earth observations and economic and social data, information and knowledge should be used together for policy and program decisions. **Affirm** that GEO and its Earth observations and information will support the implementation of, inter alia, the 2030 Global Goals for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015-2030, the United Nations System of Environmental and Economic Accounts, and the United Nations Framework Convention on Climate Change.
3. **Note** the progress GEO has made, recalling its Geneva Declaration (2014) call to improve GEO's effectiveness, broaden its engagement with stakeholders and sustain resources. **Reaffirm** that comprehensive and sustained Earth observations and derived knowledge are needed to assess, understand and predict how Earth life support system upon which the wellbeing of generations depends.
4. **Recognize** that GEO is a unique partnership of governments and participative organizations

2017 Roundtable on Value & Benefit Creation in Commercial Space

NOTIONAL AGENDA:

- 8:45 – 9:00: Opening, welcoming remarks, ground rules
 • Master Moderator: Ramin Khadem
- 9:00 – 10:30: **Discussion 1: Always listen to experts. They'll tell you what can't be done, and why. Then do it! – Recap/Revisit of Last Year**
 • Moderator: Ramin Khadem
 • Speaker 1: Michael Lopez Alegria
 • Speaker 2: Adil Jafry
 • Speaker 3: Sean Casey
- 10:30 – 11:00: Break – coffee
- 11:00 – 12:30: **Discussion 2: "Everything is theoretically possible, until it is done." – Business Models Beyond LEO and GEO**
 • Moderator: Daniel Faber?
 • Speaker 1: Bernard Kutler or Melissa Samson, United Launch Alliance
 • Speaker 2:
- 12:30 – 1:30: Lunch –
- 1:30 – 3:00: **Discussion 3: "Anything which is physically possible can always be made financially possible." – The Finances' Perspective**
 • Moderator: Jose Ocasio-Christian, Caelus Partners
 • Speaker 1:
 • Speaker 2:
- 3:00 – 3:15: Break – refreshments
- 3:15 – 4:00: Capstone Discussion – Identifying Benefit
- 4:00 – 5:00: Reception



BUSINESS INNOVATION SYMPOSIUM (E6)
 New space industry segments, firms, actor groups, and multiple programs: innovation, entrepreneurship & investment at the mesoscopic level of analysis (2)

Author: Dr. Michael Simpson
 Secure World Foundation, United States, msimpson@swfound.org
 Mr. Ian Christensen
 Secure World Foundation, United States, ibrchristensen@swfound.org
 Ms. Krystal Wilson
 United States, kwilson@swfound.org

BROADENING BENEFIT AS A PATHWAY TO THE WIDELY-ACCEPTED DEVELOPMENT OF
 EXTRA-TERRRESTRIAL RESOURCES

Abstract

Innovative applications and business plans emerging from the commercial space sector will be the subject of intense scrutiny by governments eager not to be left behind in the development of new economic activity in space. The benefits of participation in the benefits of such space activity is likely to play a significant role in the range of political support it enjoys. This paper seeks to explore this idea by looking at the specific challenges facing space mining. Considerable attention has been focused on the non-appropriation (Article 2) and exploitation and use clauses (Article 3) of the Outer Space Treaty (OST) and the common heritage language of the Moon Agreement (Article 11.1) when discussing this topic. Nonetheless, there are indications that the OST's benefit clause (Article 1) may emerge as a key to achieving broad international support for commercial mining operations beyond Earth. The multilateral utility of the benefit concept is evident in frequent references to it in such contexts as UNCOPUOS, GEO, The Hague Space Resources Governance Working Group, and numerous international space conferences. Because states will ultimately evaluate "benefit" in terms of its impact on their citizens and their wellbeing and not on the history of its use in legal proceedings, the study of the concept's potential to create a receptive and persuasive environment for commercial resource development of Earth is inherently political and economic. Fortunately, there is a rich array of terrestrial experience bridging the micro- and macroscopic perspectives that can help provide insight into how mining interests have been reconciled with those of the communities in which they have operated. These case studies also highlights to be drawn from successful examples. This paper will seek to highlight best practices from the terrestrial experience that can illuminate the challenge of broadening the benefit base for space mining. Additionally, it will offer an initial assessment of the applicability of the terrestrial experience to the special context of extracting resources from objects in space. The paper will also draw on recent work of the Secure World Foundation to improve the understanding of value creation through space activity. This aspect will argue that the ability to add and communicate value can increase the range of potential benefits that could flow from the development of space resources. The paper will also leverage prior analysis that the authors have published examining the links between social benefit, space activity, and corporate strategy.

Committee on the Peaceful
 Uses of Outer Space
 Fifty-ninth session
 Vienna, 10-19 June 2015

The United Nations/Germany International Conference on
 Earth Observation — Global Solutions for the Challenges of
 Sustainable Development in Societies at Risk

Note by the Secretariat

The present document contains the outcome summary of the United Nations/Germany International Conference on Earth Observation — Global Solutions for the Challenges of Sustainable Development in Societies at Risk, held in Bonn, Germany on 26-28 May 2015.

1. Background

1. 2015 is a decisive year as intergovernmental negotiations held with the support of the United Nations will culminate in three global frameworks that are geared to meet development trends worldwide as a way to continue efforts towards sustainable development addressing the challenges posed by climate change and natural hazards.
2. Already in March of this year, during the World Conference on Disaster Risk Reduction held in Sendai, Japan, governments of 187 countries launched the Sendai Framework for Disaster Risk Reduction. This framework defines goals and priorities for action as a way to enhance the resilience of nations in the next fifteen years (2015-2030). Later in September of this year, the United Nations Summit will adopt the Post-2015 development agenda as a way to provide continuity to the Millennium Development Goals that were launched one and a half decades ago. Furthermore, parties to the climate change convention are conducting negotiations to establish a universally acceptable framework on climate at the 21st Conference of Parties to be held in Paris, France.





Promoting Cooperative Solutions for Space Sustainability

Let's improve one small neighborhood together.





Promoting Cooperative Solutions for Space Sustainability



Promoting Cooperative Solutions
For Space Sustainability

www.swfound.org

SPACE SUSTAINABILITY

Space and Civil Society
UNISPACE+50 Symposium
18 June 2018

swfound.org