

# *>Welcome and Introduction*

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**BY**

**RAM S. JAKHU**  
*CONFERENCE CHAIR*

**29 MAY 2014**

# *Purpose of this presentation*

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- **The purpose of this presentation is to set the stage for deliberations at the 2<sup>nd</sup> Manfred Lachs Conference on Global Space Governance**
- **In order to do so, I intend to:**
- *provide a brief introduction to the McGill Institute of Air and Space Law, the organizer of this Conference*
- *explain briefly the rationale, objective and format of the Conference*



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# *McGill Institute of Air and Space law*

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- **Created in 1951, McGill University's Institute of Air & Space Law provides cutting-edge graduate-level legal education.**
- **McGill University & its Faculty of Law are consistently ranked among the top 20 educational institutions in the world.**
- **The Institute is the uncontested world leader in its field of speciality.**
- **It offers the most advanced and comprehensive (& the least expensive) air and space law program in the world.**
- **Over the past 63 years, the Institute has produced more than 1000 graduates, most of whom occupy very senior positions in more than 120 countries around the world.**



**John C. Cooper**

**The IASL offers the best and the highest number of fellowships for study of air and space law at the master, doctoral and post-doctoral levels.**



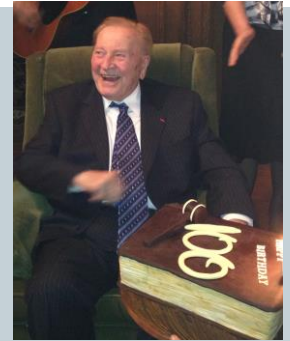
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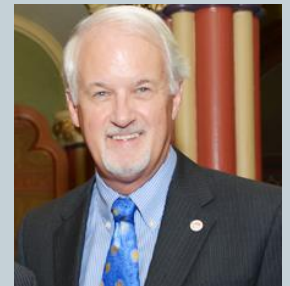
- **Thanks to Prof. Dempsey's directorship, the Institute is excelling in teaching, research, funding and outreach.**

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- **From time to time, funds for our various activities have been provided by numerous institutions from around the world.**
- **During the last few years, the Institute has received donations totaling more than \$5 million from the Boeing Company and the Erin J.C. Arsenault Foundation, mainly for space law.**
- **Annually , the Institute organizes about 8 conferences around the world. This event is the 4<sup>th</sup> such activity just in this month.**
- **We have the necessary intellectual and organizational expertise, the required human and financial resources, and most importantly, a strong commitment to providing quality education, research and outreach.**
- **Against this backdrop, the Institute took the initiative in organizing this unique international interdisciplinary conference on global space governance.**



**Nicholas M. Matte**



**Paul S. Dempsey**



# *Rationale of the Conference*

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- The current global space governance system was **created during the 1960's and 1970's**.
- Since then, the international community **has not comprehensively examined** this issue.
- Meanwhile, **numerous developments** have occurred in the world in general, and the space sector in particular, that have **serious implications** for the current and future conduct of space activities.
- Therefore, it is believed that the **time has come to thoroughly assess** the efficacy of the current regime of global space governance.



# Global Space Governance?

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- ***Governance* is a wide term that is open to multiple interpretations.**
- **For the purpose of this Conference, *governance* refers to the manner of governing or regulating, and it covers not only legal frameworks and legal systems, but also incorporates political, economic, sociological, cultural and other relevant aspects of space activities.**
- **A *governance system* is a means to achieve a stated goal.**



# Goal : to use space for peaceful purposes and for the benefit of all mankind

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- **That goal** has been well-established and recognized by the international community since the beginning of the space age. As stipulated in the Outer Space Treaty, it refers to:

*“the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes, [and that] the exploration and use of outer space should be carried on for the benefit of all peoples [and in the interest of all mankind] irrespective of the degree of their economic or scientific development.”* Outer Space Treaty

- **i.e. Outer space must be used for peaceful purposes and for the benefit and in the interest of all mankind (i.e. the ‘global public interest in outer space’)**



# ***Current global space governance system was created:***

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1. During the **Cold War** era, when global geo-politics was essentially bi-polar
2. Back then:
  - only a **handful** of countries were involved in space activities
  - space activities were **limited** and were **mainly scientific** and **exploratory** in nature
  - space **military operations** were the dominant space activities
  - only **governments** were involved in the space sector (private sector was almost non-existent)





# ***Current global space governance system was created:***

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- **satellite communications** was the only space application for the civil society
- space **did not matter** much for the people and nations
- there were **no major challenges** in the conduct of space operation
- the **United Nations** (and to some extent the ITU) was the only forum for the development of global space governance system
- the system consisted mainly of binding but broad **international treaties**



## *So far, the international space legal system has been adequate...*

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- To date, the international legal regime governing space has **been largely successful** in maintaining law and order as well as the **smooth operation** of space activities, including those carried out by private entities.
- **However**, the **inadequacy** of the existing regime of global space governance has started **emerging**, particularly due to:

**Changing global geo-politics**

**Expanding space activities and space players**

**Emerging issues and challenges**

- **Let us now see some of these developments:**



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# 1. *The Cold War is (a sort of) over and the global economic and political power is shifting*

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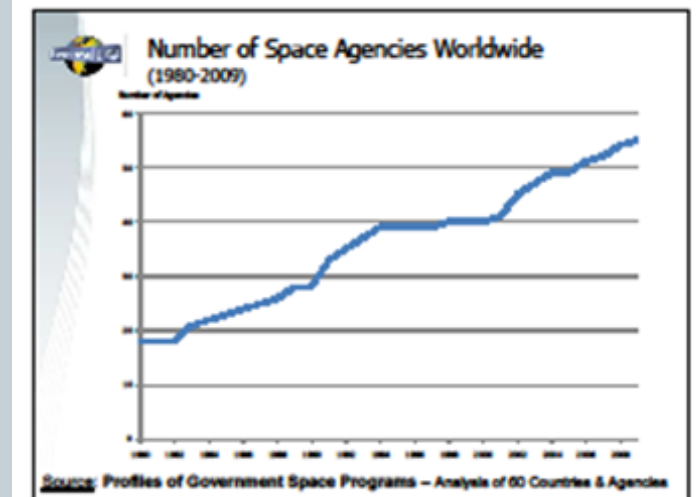
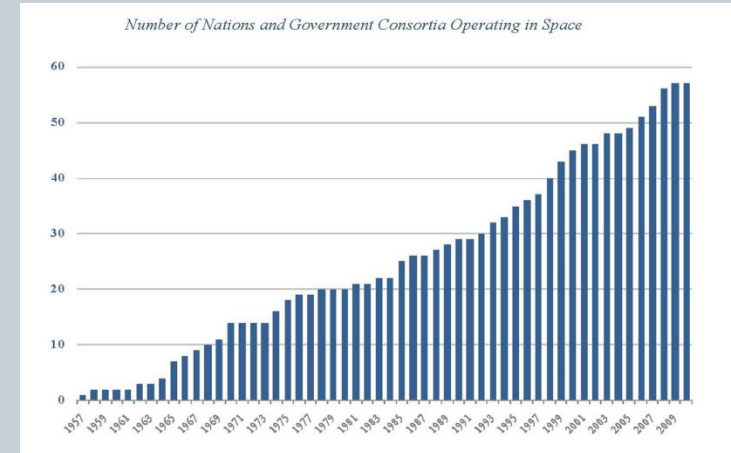
- **World Bank (April 30 2014): China Set To Overtake US As **World's Largest Economy** While India Pulls Ahead Of Japan To Become Third-Largest Economy.** (<http://www.ibtimes.com/china-set-overtake-us-worlds-largest-economy-while-india-pulls-ahead-japan-become-third-1578235> )
- **By 2025, the OECD says the **combined GDP of China and India will be bigger than all of the G7** countries combined (i.e. the US, UK, Germany, Japan, France, Italy and Canada)** <http://www.cbc.ca/strombo/news/the-balance-of-power-new-report-says-china-will-overtake-the-us-and-become-> (Nov. 09, 2012)



## 2. The number of space-faring nations and governmental space agencies is increasing

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- **As of 2014:**
  - **13 countries have independent launch capability**
  - **Over 60 countries operate satellites ->**  
(National Air and Space Intelligence Center, cited in *National Security Space Strategy-Unclassified Summary*, January 2011, 2)
  - **Over 70 space agencies ->**
  - **Out of a total of 1167 currently operating satellites, 502 belong to the US, 118 to Russia, 116 to China and 413 to others**



### ***3. More countries are having their dedicated military satellites***

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- **The latest are:**
- **Canada (Sapphire)**
- **India (GSAT-7)**



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# 4. Private sector operates more satellites than military

[http://www.ucsusa.org/nuclear\\_weapons\\_and\\_global\\_security/solutions/space-weapons/ucs-satellite-database.html](http://www.ucsusa.org/nuclear_weapons_and_global_security/solutions/space-weapons/ucs-satellite-database.html)

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## Satellite Quick Facts

Total number of operating satellites: 1167

LEO: 605      MEO: 77      Elliptical: 38      GEO: 447

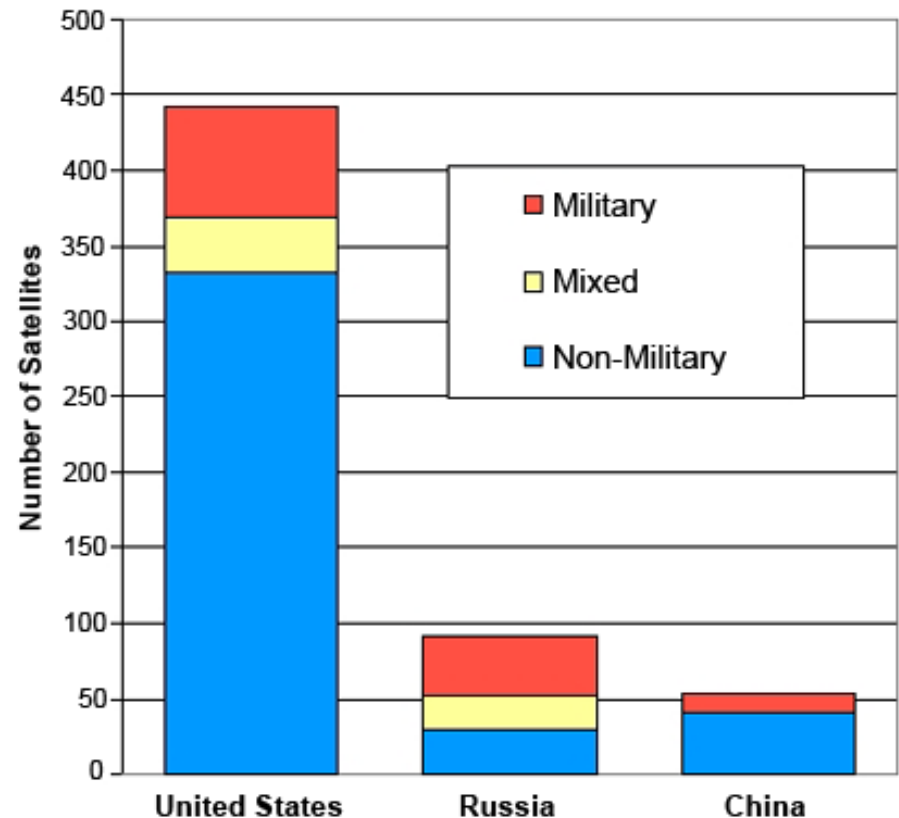
United States: 502      Russia: 118      China: 116

Total number of U.S. Satellites: 502

Civil: 20      Commercial: 210      Government: 120      Military: 152

*includes launches through 1/31/2014*

### Estimates of Space Assets



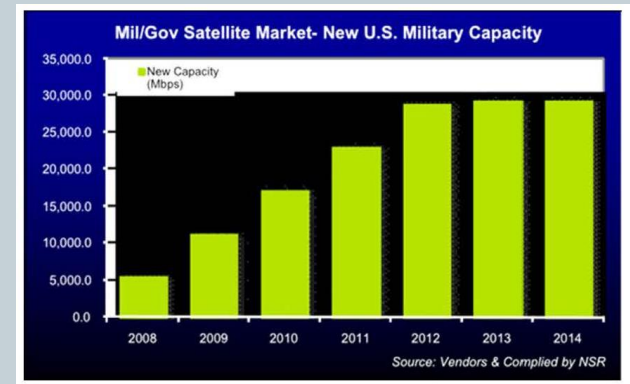
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## 5. *Militaries are using more commercial satellites: e.g.*

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- “Satellite capacity usage by the U.S. DoD has increased fivefold over 2000-2012 to over 10GHz, primarily driven by the two large conflicts in Iraq and Afghanistan. .... Commercial satellites supply approximately 70% of the capacity now used for military satellite communications worldwide.” : [A Multi-Billion Dollar Military Satellite Market](http://www.spacewar.com/reports/A_Detailed_Roadmap_To_The_Multi_Billion_Dollar_Global_Military_Satellite_Communications_Industry_999.html) (May 14, 2014)  
[http://www.spacewar.com/reports/A Detailed Roadmap To The Multi Billion on Dollar Global Military Satellite Communications Industry 999.html](http://www.spacewar.com/reports/A_Detailed_Roadmap_To_The_Multi_Billion_Dollar_Global_Military_Satellite_Communications_Industry_999.html) ->
- Commercial “COMSAT is cheaper and faster to launch than MILSAT and, in some cases, COMSAT technology is advancing faster than MILSAT.” : Defence Business Board, Report to the Secretary of Defence (2013),  
[http://www.defensedaily.com/Assets/DBB SATCOM.pdf](http://www.defensedaily.com/Assets/DBB_SATCOM.pdf) ----- >



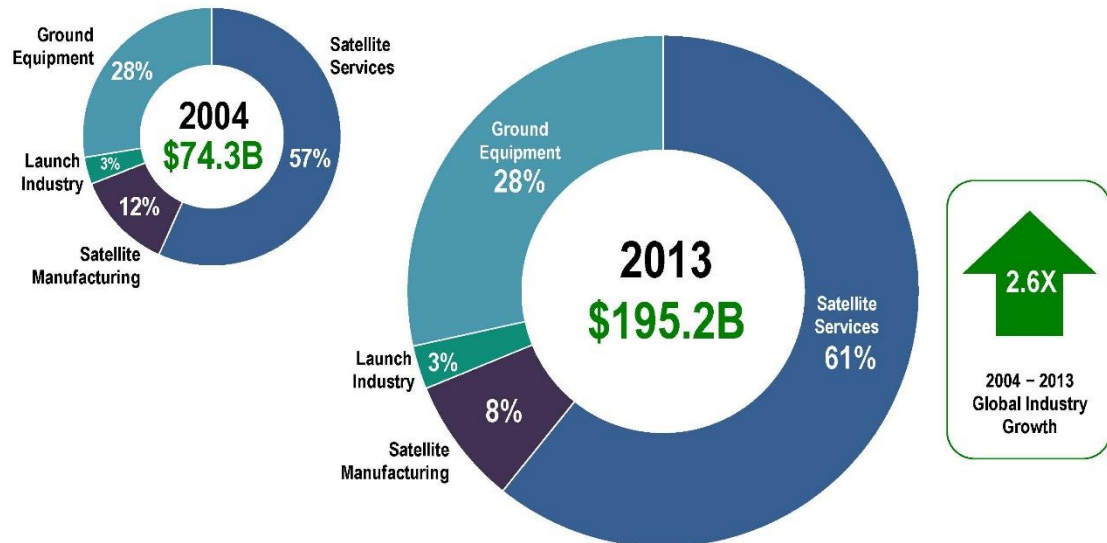
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## 6. Commercial space sector is expanding rapidly

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### World Satellite Industry Revenues By Segment: Long-Term Review



Global satellite industry revenues have nearly tripled since 2004, with an average annual growth rate of 11%

Global space economy grew from \$164 billion in 2004 to \$320 billion in 2013.





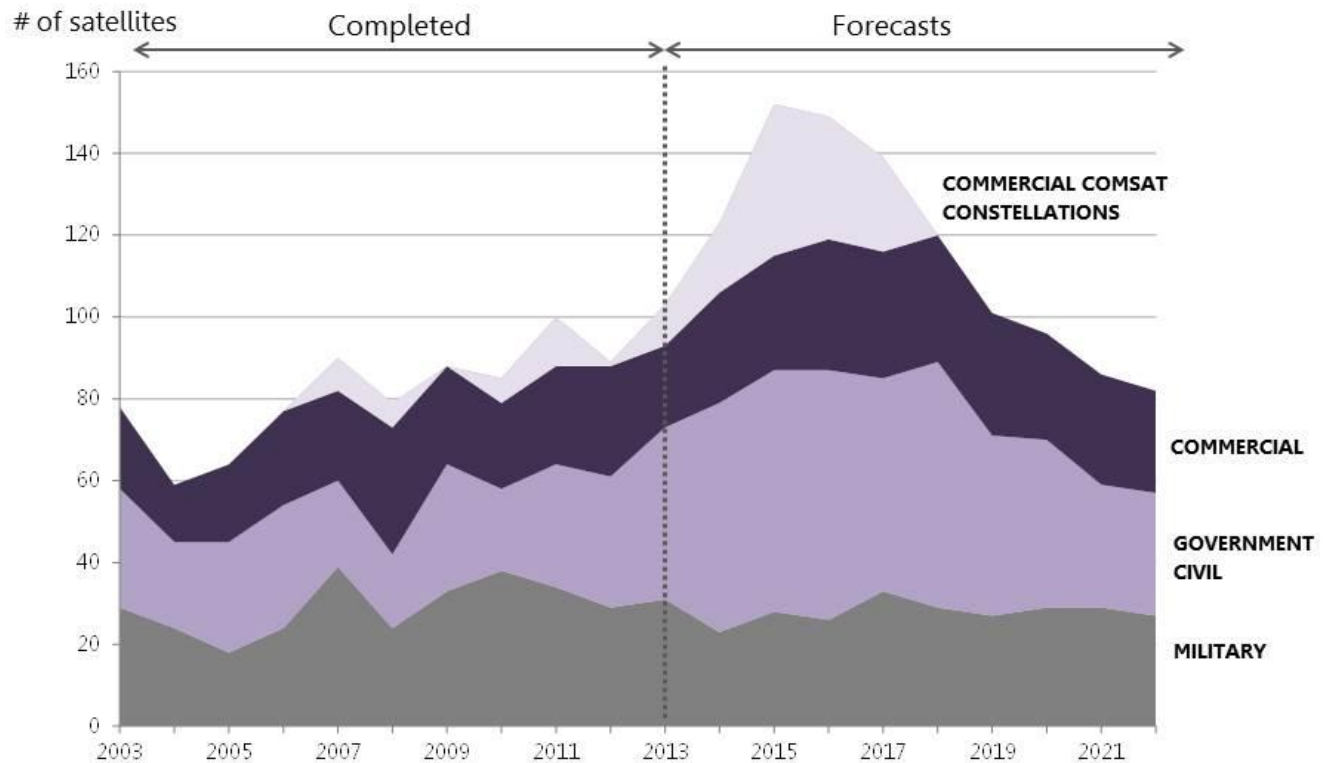
# 7. Space activities will be expanding further as more satellites will be launched in the future

[http://www.satellitetoday.com/wp-content/uploads/2013/11/new-graph\\_satellites-launched-by-year-client\\_2013.jpg](http://www.satellitetoday.com/wp-content/uploads/2013/11/new-graph_satellites-launched-by-year-client_2013.jpg)

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An average of about 47 satellites and 27 launches per year

### SATELLITES LAUNCHED BY YEAR: DISTRIBUTION BY CLIENT (2003-2012, FORECAST TO 2022)



Satellites to be Built & Launched by 2022 World Market Survey  
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## 8. Exponential increase in small satellites (cubesats-nanosat)

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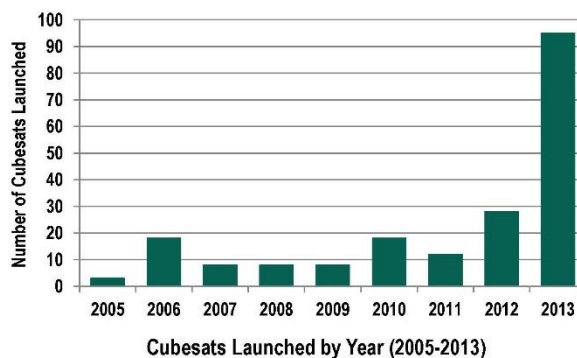


NASA: Cubesat whose typically dimensions are 10 × 10 × 10 cm and which has a mass of about 1 kilogram.

### Case Study: Cubesats



- 91 cubesats launched in 2013 more than in the last 8 years combined
- Not a major driver of launch revenues, ~\$100,000 to launch, and cubesats for education launch for free
- Cubesat predominantly for test and R&D by governments, universities, and non-profits
- 8 commercial cubesats launched in 2013 in remote sensing and communications
- All cubesats currently launched to LEO, developments underway to send cubesats GEO in late 2015



#### What is a Cubesat?

A cubesat is a cube-shaped satellite bus measuring 10cm on a side, with a mass of 1-2 kilograms. Several can be stacked together (2U, 3U, 6U) depending on mission.

#### Cubesat Costs

- » **Low Cost:** 1U cubesat bus kits can be purchased for \$13,000, with 6U configurations reaching around \$30,000
- » **Moderate Cost:** Boeing-built cubesat platforms for NRO are expected to cost no more than \$250,000
- » **Higher Cost:** NASA expects that cubesats used for planetary science missions may cost between \$3-\$10 million

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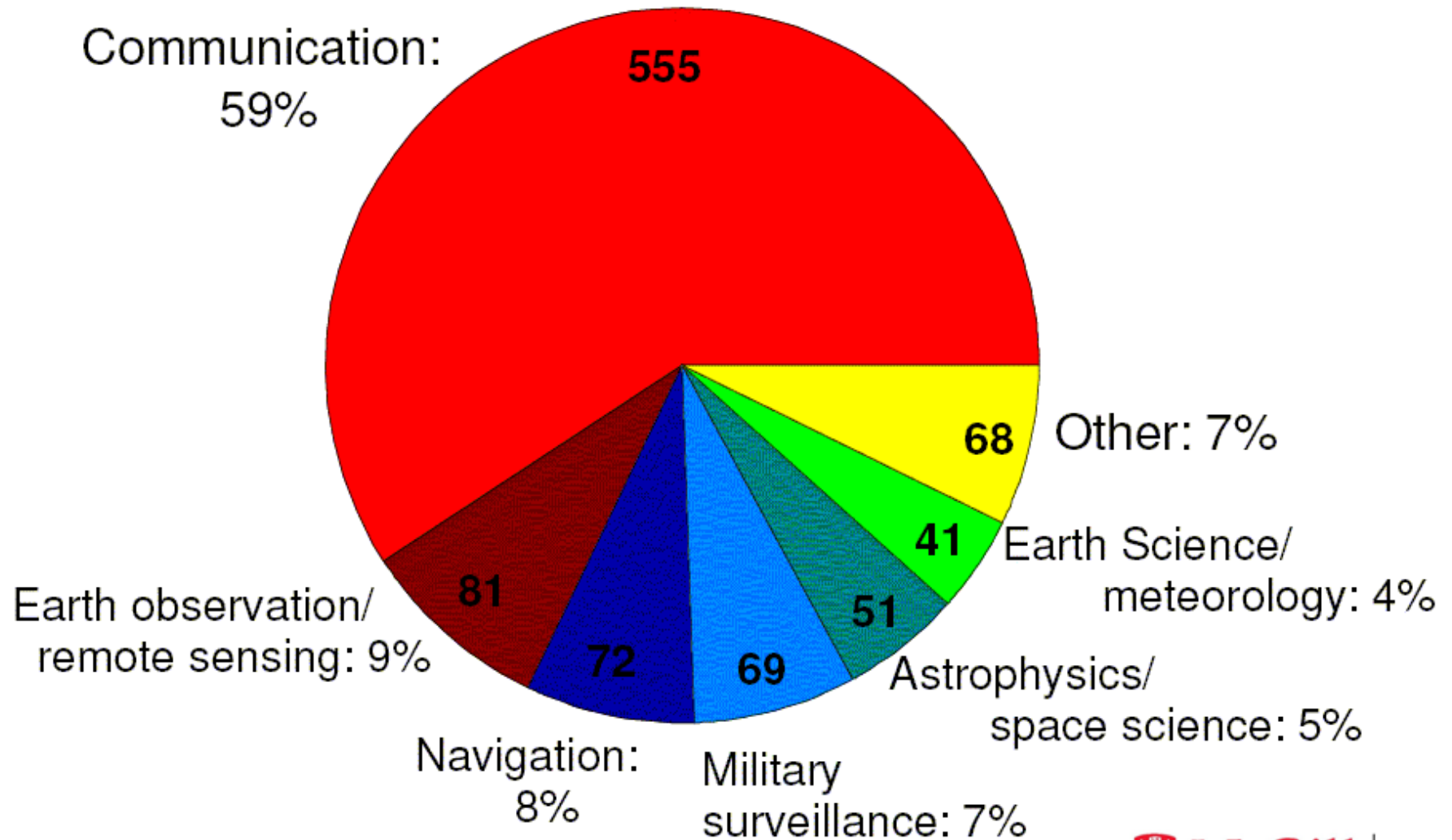
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## 9. Space applications (uses) are increasing

[http://www.ucsusa.org/nuclear\\_weapons\\_and\\_global\\_security/solutions/space-weapons/ucs-satellite-database.html](http://www.ucsusa.org/nuclear_weapons_and_global_security/solutions/space-weapons/ucs-satellite-database.html)

(19)



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## *10. Space matters and will matter more in the future*

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- **Currently, the world depends heavily upon space, and life without satellites could be *very difficult* and *even disastrous***



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# World Economic Forum: A Day without Satellites

Davos: 27 January 2012

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Satellites play an *increasingly important role* in society, the global economy and military activities.

Daily routines will be quite difficult without satellites



<http://www.openforumdavos.ch/en/a-day-without-satellites.html>



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# European Satellite Day 2012™

Mayday! - A day without satellites

Under the patronage of Antonio Tajani, Member of the European Commission



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27 September 2012 / Committee of the Regions . Brussels

Hosted by



This European Conference cautioned about “the **disastrous impact** that would be had if ever we had the misfortune to experience just one day without satellites.”

# *World unaware of growing dependence on space*

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BBC reporter **imagined** a day when all satellites stopped working:

“The world was not shut down but it was in crisis with **economic losses** mounting into the many **billions of dollars.**”

Credit: Richard Hollingham of BBC Future – **June 2013**

<http://www.bbc.com/future/story/20130609-the-day-without-satellites/2>



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# *U.S. Forces Prepare for a 'Day Without Space'*

## February 2014

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“A **potential nightmare** for combatant commanders is a ‘day without space.’”



<http://www.nationaldefensemagazine.org/archive/2014/February/pages/USForcesPreparefora%E2%80%98DayWithoutSpace%E2%80%99.aspx>



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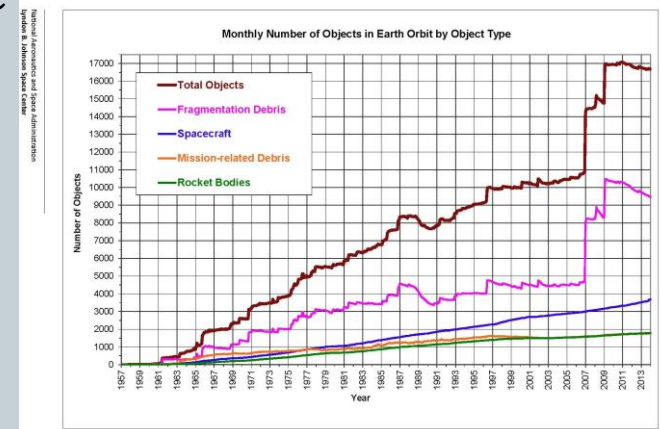
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## 10. Emerging legal and political issues related to:

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- a. Radio frequencies and geostationary slots
- b. Space debris
- c. Small satellites
- d. Space militarization and weaponization
- e. Human space travel (space tourism)
- f. Space-based solar power
- g. Mining of the Moon and asteroids for natural resources
- h. Natural cosmic hazards and planetary defence
- i. Human migration to space



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## 11. Fragmentation of global decision-making

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1. The development of **hard** international space law has **almost** stopped since 1979.
2. There is a trend towards the adoption of non-binding resolutions, guidelines and codes of conduct.
3. The **United Nations** is largely being **ignored and by-passed** by special interest groups of a limited number of nations.
4. There **seems to be no global institution fully in-charge** to make decisions, and take actions, on behalf of the mankind as well as to carry out close and effective coordination in the global space area.



# Who is in-charge of space?

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# Will the global space governance system be adequate in the future ?

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- These developments, and many others, are **challenging the very foundations** of the existing model of global space governance.
- The question is :
- **Will the current global space governance system be adequate and appropriate in the future?**



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One may either say:



Or...



- **“Houston, we have a problem!”**
- **If we agree with the latter, we ought to start understanding the nature, severity, and imminence of the problem, and we ought to start considering potential solutions to the problem.**
- **In order to do that, there is no better way than **an international interdisciplinary exchange of ideas at a neutral forum**, like this Conference**



<http://www.phrases.org.uk/meanings/houston-we-have-a-problem.html>

# Objective of the Conference

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- This Conference is convened to address the **following question:**
- **If the goal is to use space for peaceful purposes and for the benefit of all mankind, then what sort of governance system (as a means) will be appropriate to effectively achieve that goal?**
- **i.e. What form should global space governance take, both in terms of format and substance, in the next 20-30 years?**



# Format of the Conference

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- The Conference is a unique, international, interdisciplinary gathering
- **(We are going “Where No One Has Gone Before”)**
- The Conference is designed to take a **comprehensive look at the “Big Picture”** of global space activities and global space governance.
- At the Conference, there will be 4 plenaries, 10 breakout sessions & a concluding plenary.
- We will start with discussion on **human biological evolution** and the role of global governance with respect to human migration to space.
- Global space governance is a part of **general global governance** as well as **general international law and relations**. The next two plenaries will address issues to determine the **extent and in which direction** global space governance can realistically be expected to, and should, evolve.





# *Format of the Conference*

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- The **4<sup>th</sup> plenary** will assess the adequacy and/or effectiveness of existing global space governance mechanisms.
- **10 breakout sessions** will focus on issues of governance related to various specific - current and emerging - space applications
- The **final concluding plenary session** will be in the form of a roundtable discussion between the chairs of the previous sessions. It will present the main points of their respective sessions.



# Conference participants

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- **The participants in the Conference are **experts in various disciplines and subjects** related to space activities, including:**
  - **Astrosociology;**
  - **Aviation and Navigation;**
  - **Global and Regional Governance Studies;**
  - **Global Values and Ethics;**
  - **Human Evolution and Space Migration;**
  - **Human Space Flight and Space Safety;**
  - **International space law and relations;**
  - **National Space Laws and Policies;**
  - **Planetary Protection and Planetary Defense;**
  - **Political Science and International Relations;**
  - **Public International Law;**
  - **Remote Sensing and Earth Observation;**
  - **Role of Private and Commercial Enterprises; etc.**
  - **Satellite Telecommunications;**
  - **Space Debris and Space Environmental Contamination;**
  - **Space Militarization, Weaponisation and Security;**
  - **Space Natural Resources;**
  - **Space-Based Solar Power; etc.**



# Conference participants

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- More than 120 experts from over 20 countries **in all continents** of the world.
- **Affiliated** with academic institutions, space agencies, governmental departments, militaries, international organizations, private companies, law firms and consulting agencies, and some are students.
- You are **not expected to be representatives** of your countries and employers but **we appreciate your perspectives** from the fields of your activities, the sectors of your employment and the countries of your residence.
- There is an **inter-generational involvement** of people; some are personalities retired after decades of active service, and others are young individuals who are starting their studies in space law and other related fields.



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# Conference program development and papers

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- During the Conference, there will be **over 75 papers** presented.
- The presentations will consist of several papers selected out of about 80 **abstracts received** and the remaining are **invited papers**.
- The selection of abstracts and invitations for papers was based on **balancing input** from well-recognized and knowledgeable experts and contributions from young scholars with innovative thoughts on global space governance.
- The program of the Conference was developed with **input from over 30** experts from all over the world.
- Selected papers of the highest quality will be **published** in an edited book.
- The Conference is a **joint venture of 14 institutions** from various countries.
- The Conference is **financially supported** by the Eric J C Arsenault Fund at the Faculty of Law and the Secure World Foundation.



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# *Hopes and aspirations for the Conference*

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- Realistically, we **cannot address and find solutions** to all the problems related to global space governance.
- Nevertheless, we are initiating an **objective global dialogue** that ought to be continued and expanded.
- Academic institutions, in association with civil society and the private sector, should bring the **major issues and challenges** related to global space governance to the attention of the international community.



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# *Hopes and aspirations for the Conference*

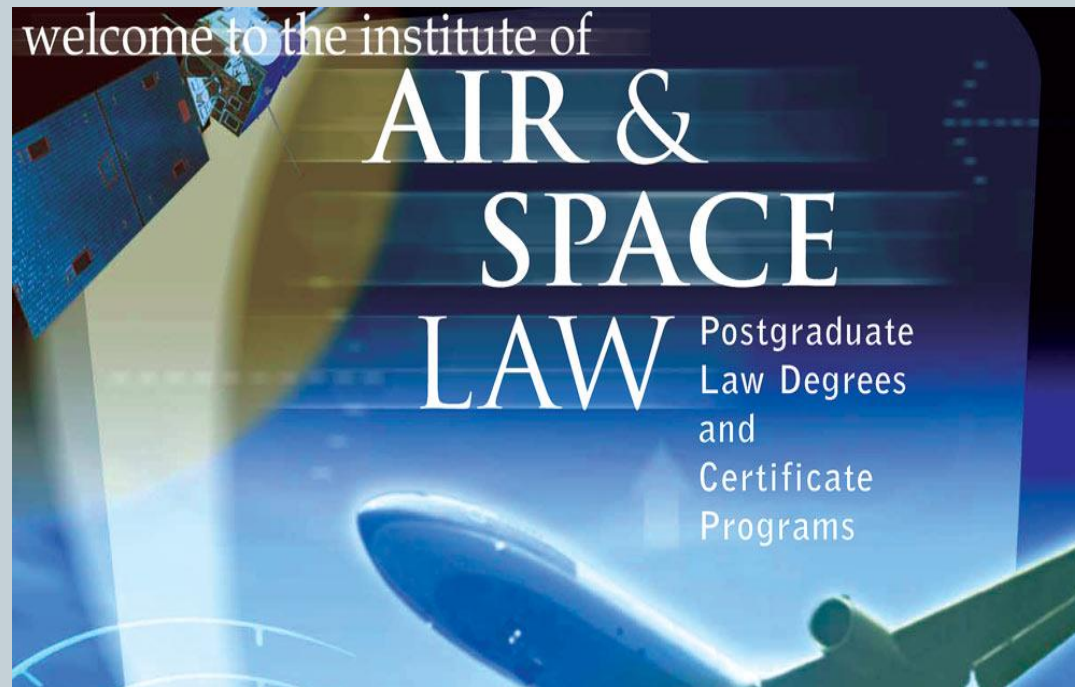
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- **The Conference provides a neutral setting for international and interdisciplinary deliberations, and thereby serves as a prelude to a responsive UNISPACE IV-like conference (in some form or shape) that ought to address issues relating to global space governance.**
- **I propose to you to seriously consider** the merit of convening such a conference in two years with global participation by all stakeholders.
- **If you believe that there is a need for such a gathering, our Institute will be glad to take the lead again, with your advice and support!**
- ***Global problems need global solutions that are sought and implemented through global participation.***



***THANK YOU FOR YOUR ATTENTION***

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**SAVE THE DATE FOR:  
3<sup>rd</sup> Manfred Lachs International Conference on  
“The Role of Law in the Commercial Uses of Space,”  
May 8-9, 2015  
IASL, McGill University, Montreal, Canada.**