

Global Governance of Space Activities

G rard Brachet
Space Policy Consultant
Adviser to the Ministry of Foreign Affairs
President, Acad mie de l'Air et de l'Espace
/Air and Space Academy
Vice President, IAF

Address: 37 rue Tournefort, 75005 Paris, France

E-mail: sicitur@wanadoo.fr

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Activities in Outer Space. Where are we today?

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- **The United States, with its new space exploration vision, has turned away from the Space Shuttle/International Space Station strategy of the nineties;**
- **Will the new US Administration confirm 100% of the space exploration vision?**
- **Will space-based earth observation (NASA and NOAA) regain some political support?**
- **Will military space systems continue to be funded at the same -very high- level?**

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- **The Russian Federation is trying to find ways to become a great player again, building on its vast experience and its strong industrial base;**
- **So far, the priority seems to rebuild its former military space capacity;**
- **On a political level, Russia is a major actor of the PAROS discussions at the Conference on Disarmament.**

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- **China has become a very significant player and is now playing in the major league;**
- **Its successful manned missions have had a strong political impact in Asia;**
- **China is coming back in the commercial launch services business. It will be a very strong competitor to European, Russian and Ukrainian launchers;**
- **However, the Chinese ASAT “experiment” of January 11, 2007 has raised questions about China’s behavior in outer space.**

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- **Europe is trying hard to define an EU wide space policy. It benefits from a well organized and successful European Space Agency;**
- **Europe does not have a well organized defense space policy. Only a few European states invest in -national- military space systems;**
- **Europe has a very strong space industry which requires to find markets outside of the European Union.**

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- **Canada is a smart player in space and builds on a very strong scientific and industrial base;**
- **Canada is very good at negotiating cooperation agreements with the USA and Europe which maximize the value - and visibility - of its investments in space ventures.**
- **Canada also plays a key coordinating role on PAROS discussions at the CD.**

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- **India has developed a very impressive, applications oriented space program and now displays new ambitions in space science and exploration;**
- **India benefits from an excellent image as a developing nation which has successfully mastered space systems and space-based applications.**

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- **Many emerging countries such as Algeria, Argentina, Brazil, Korea, Iran, Malaysia, Nigeria, South Africa, Thailand, etc., are becoming active participants (micro- and mini-satellites).**
- **Global governance discussions need to take them on-board.**

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Let us reflect for a moment on the motivations for states to invest in outer space activities.

There are three basic and interconnected motivations:

- **Scientific research/Exploration/Discovery**
- **Applications to society's needs**
- **Security and Defense**

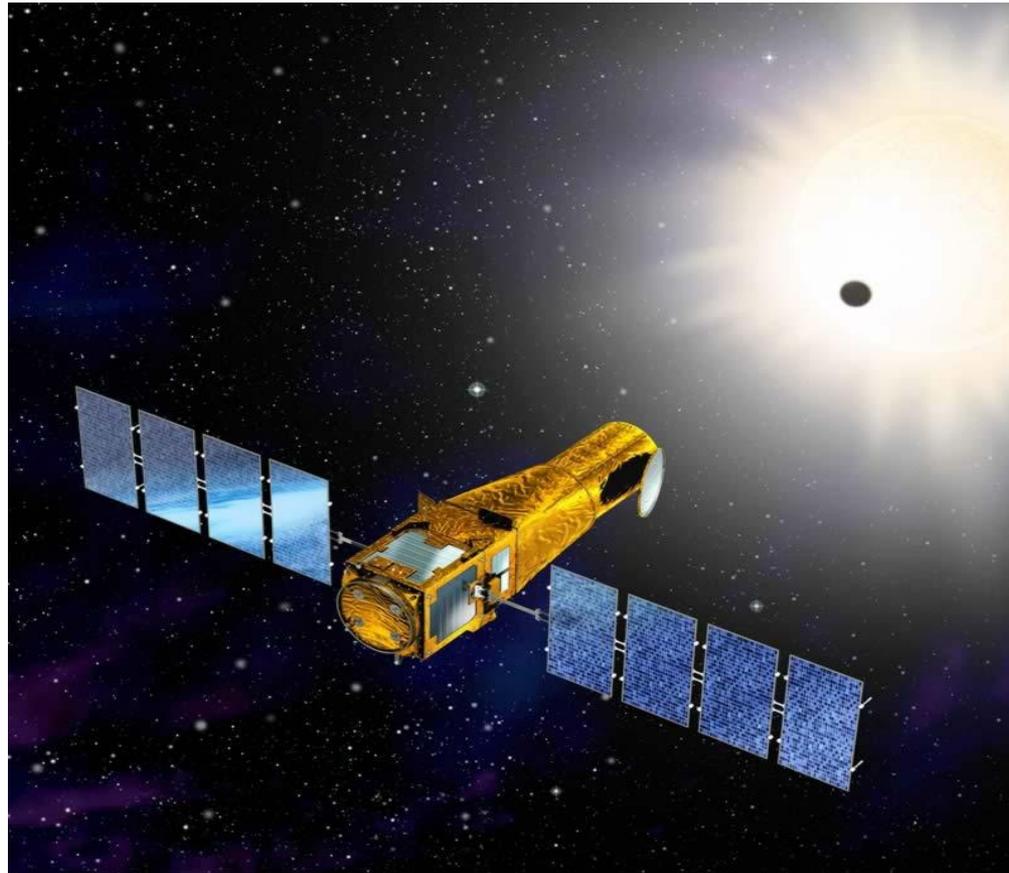
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1/ Scientific research and exploration are prime drivers for space activities.

- **Exploration (primarily robotic) of the solar system and of the universe, discovery missions (the Moon, Mars, Venus, comets, asteroids, etc.)**
- **Research for a better understanding of our own planet (global change, climate, atmospheric processes, oceans, land masses, earth physics)**

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**The French Corot exoplanet discoverer,
launched in November 2006**



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6 May 2009

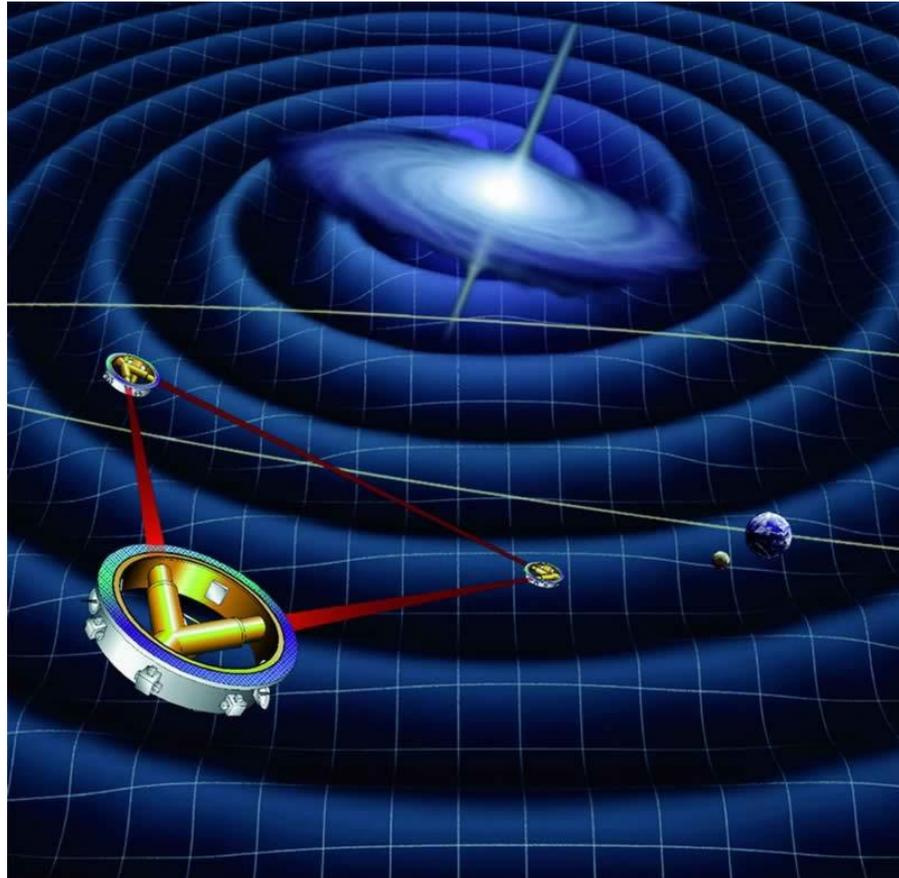
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The European Aurora program: roving on the surface of Mars...



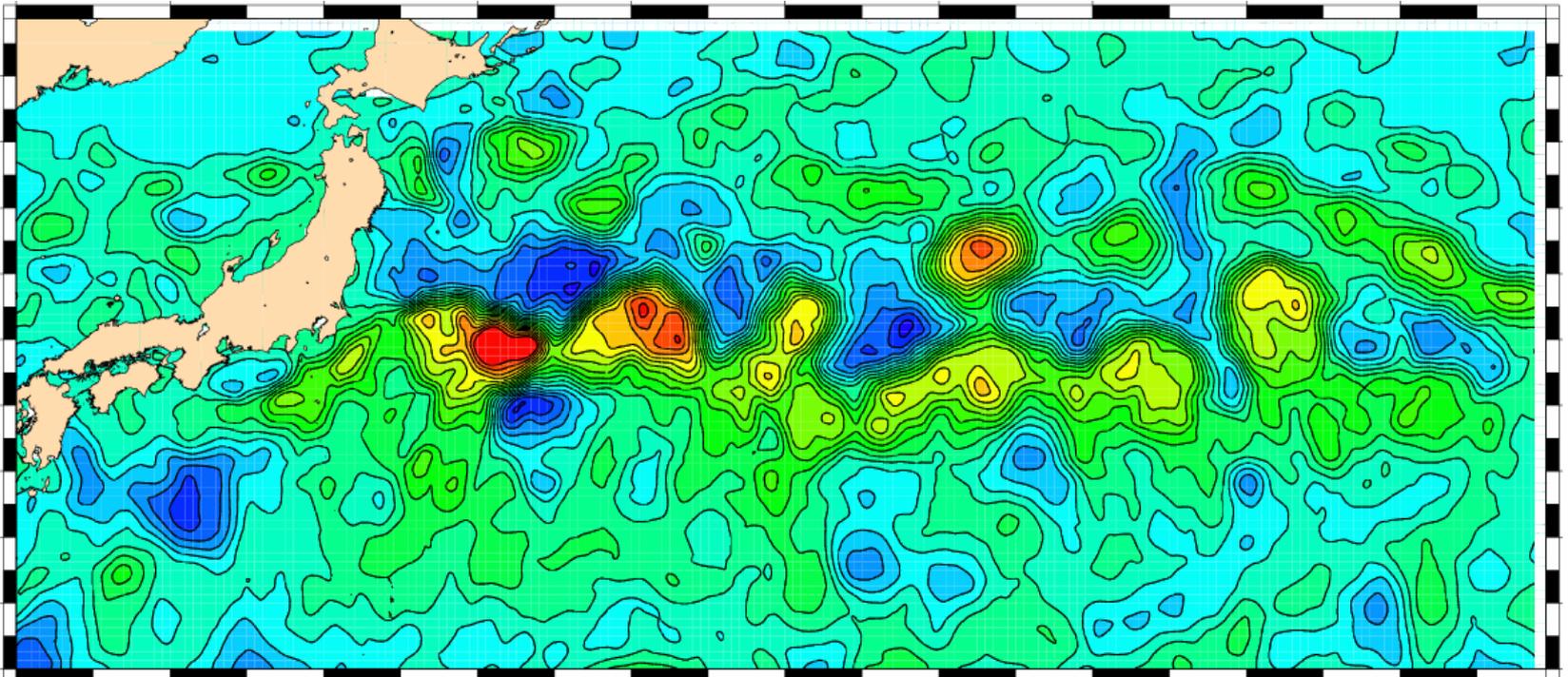
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Beyond our galaxy: Large base interferometry in the solar system: Lisa



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Ocean circulation is a key to seasonal climate forecasting : Pacific ocean eddies as derived from Jason-1 and Envisat altimetric data



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2/ Applications of space systems to satisfy society's needs:

- **« Public good » applications (meteorology, environment monitoring, civil protection, search and rescue)**
- **Commercial, market driven applications such as telecommunications and broadcasting, navigation services**

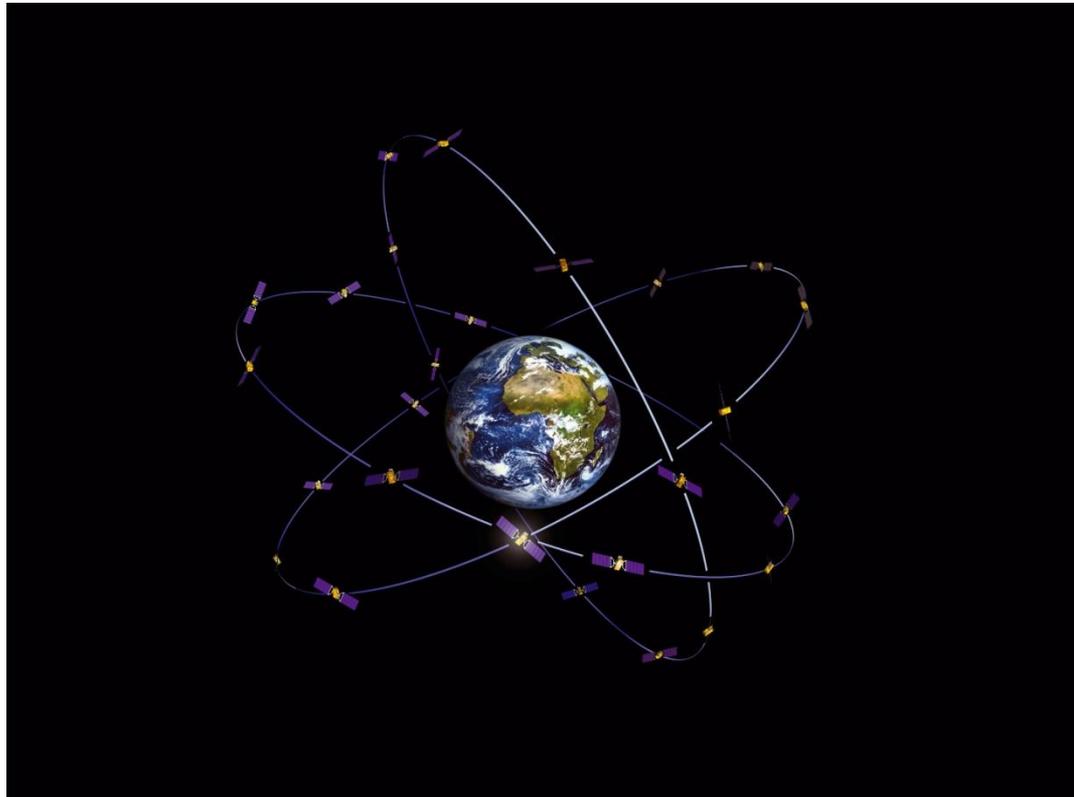
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Both categories of space-based applications require a close interaction with:

- **scientific research (e.g. weather and climate);**
- **and technological innovations (telecoms, navigation).**

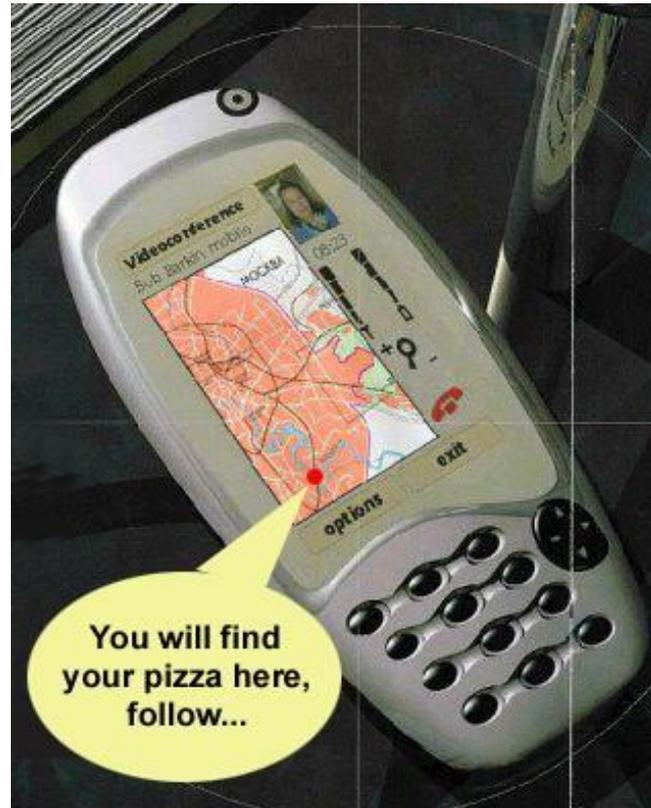
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The Global Navigation Satellite Systems (GNSS) will require some kind of a global governance.



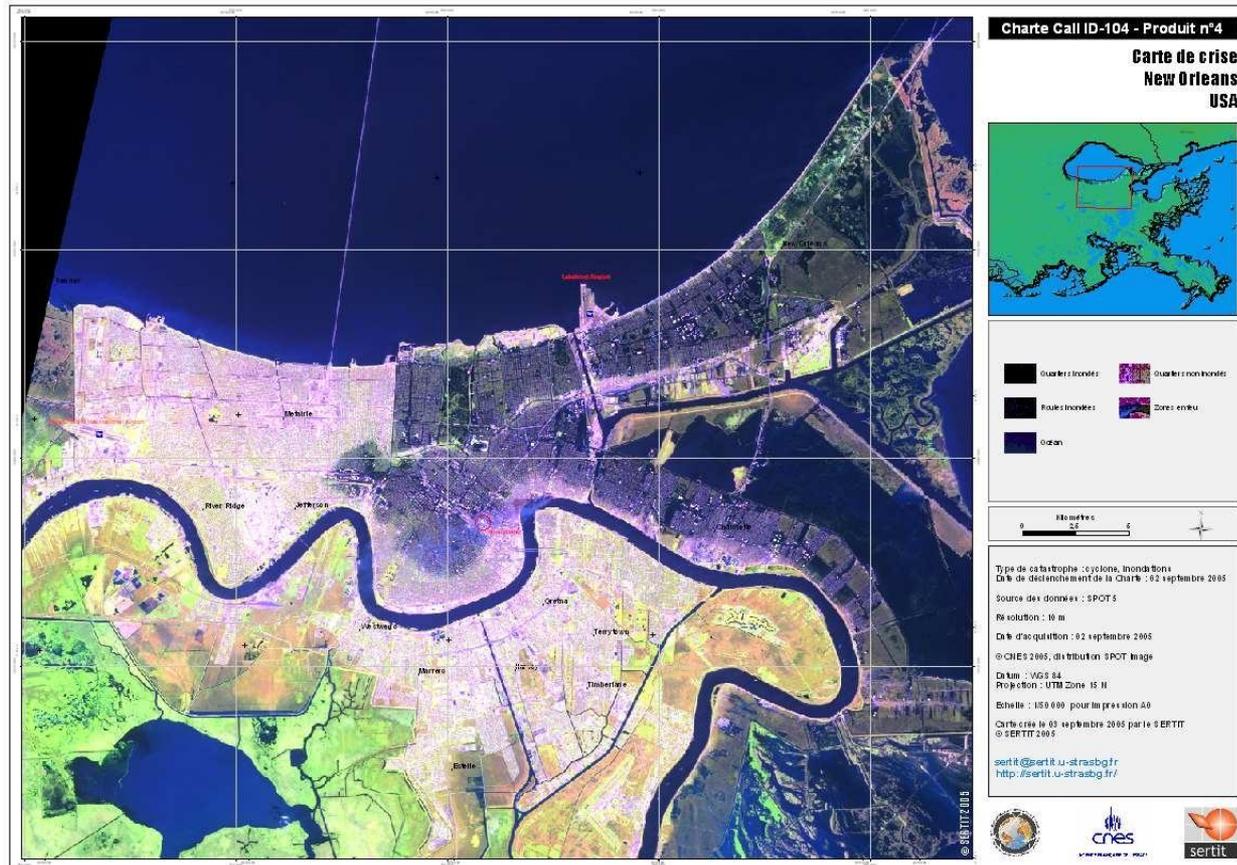
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An increasing number of applications combine navigation terminals with mobile telecoms.



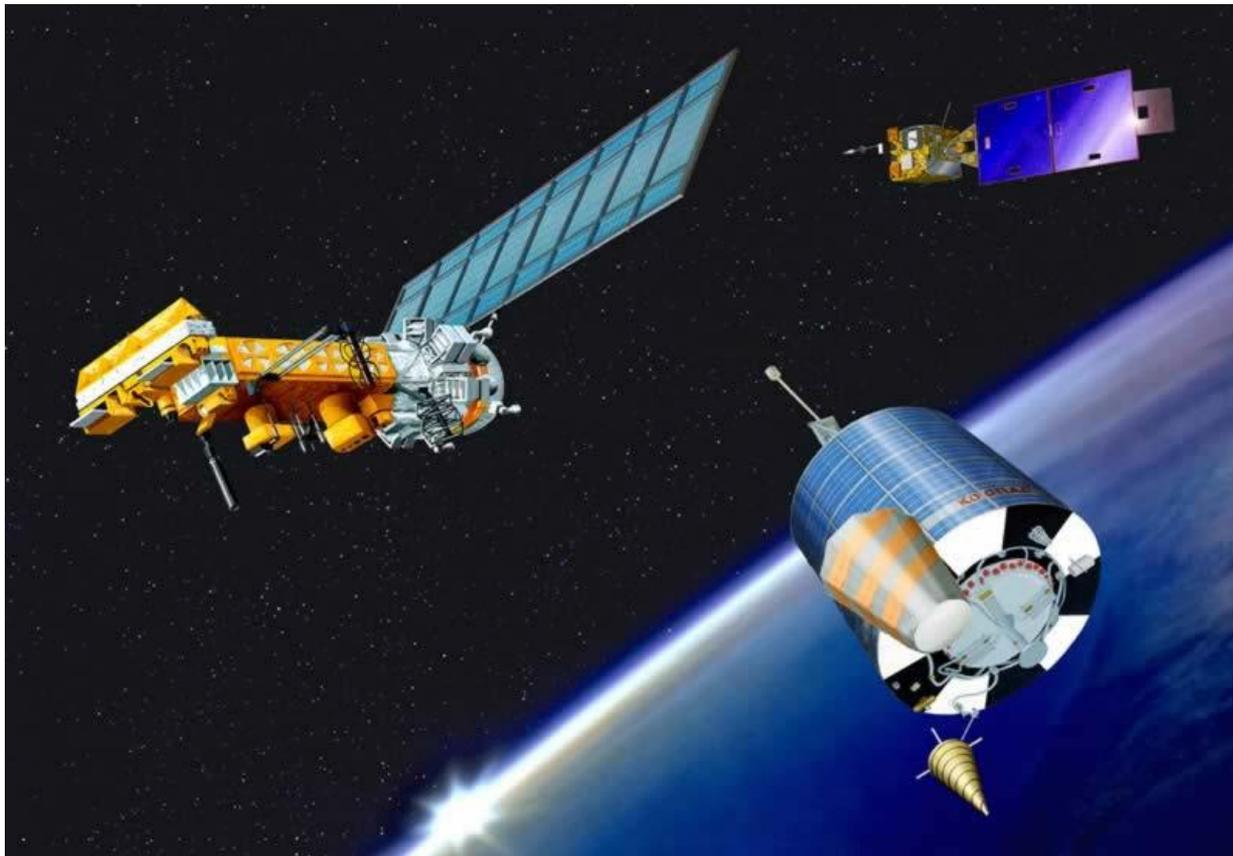
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Crisis image map, New Orleans flooding on September 2, 2005



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The Search and Rescue COSPAS-SARSAT System (Canada, France, Russia, USA) is operational since 1982.



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More than 18 000 lives have been saved since it started operating.

Below, a rescue operation at sea following a COSPAS-SARSAT distress alarm



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3/ Security and Defense was the prime motivation for the space programs of the US and the USSR during the cold war.

It is still today a major element of national space policy in many countries:

- **Space technology is very close to aerospace and missile technologies**
- **Mastering space systems is an indicator of states' military and defense capabilities (e.g. China)**

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Launcher technologies are very similar to long range missile technology



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Reconnaissance military satellites use the same technologies as civilian Earth observation satellites (here: The French Helios 2 spacecraft)



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A typical reconnaissance satellite image



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4/ What about manned space activities?

- **They were driven by strategic considerations during the last fifty years, i.e. political demonstration of technical capabilities, as in the Apollo program, or China more recently;**
- **Today, the new emphasis on manned space exploration in the US seems to be driven by the need to reaffirm leadership;**
- **Will this motivation be compatible with international cooperation?**

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After almost fifty years of space activities, manned space missions have not demonstrated their cost-effectiveness in the three main areas of space applications discussed above.

Two exceptions, however :

- **Repair missions such as the Hubble telescope;**
- **Scientific investigations of the human behavior in microgravity.**

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However, manned space missions will find a new purpose within an ambitious space exploration programme.

Why?

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Because humans want to participate « in situ » to exploration ventures.

The early exploration of the continents, the discovery of the polar regions, the competition to climb the highest mountains or dive to the bottom of oceans, and of course the race to the Moon, confirm that exploration is not complete as long as humans have not « gone there » and come back to report.

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The new US space exploration strategy introduced by former President George W. Bush in January 2004 is giving NASA a new sense of purpose, a new mission.

Question: will the international partners of NASA want to join?

Maybe, if the conditions are acceptable.

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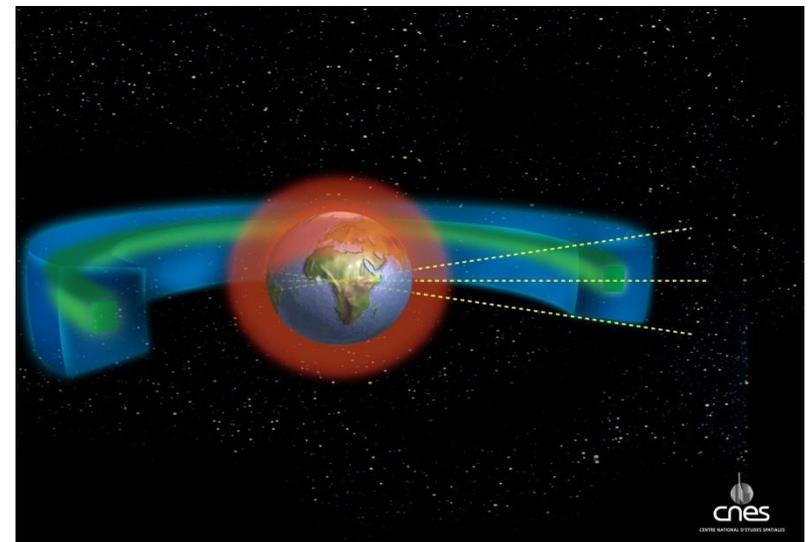
What are the challenges facing outer space activities today?

- **The increasing crowding of near earth orbits and the exploding population of space debris**
- **The economic sustainability of space-based applications on the long term**

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Increasing crowding in earth orbits:

- **4600 satellite launches since 1957;**
- **more than 800 operational satellites;**
- **380 active spacecraft in GEO**
- **19000 tracked objects larger than 5-10 cm, of which**
 - **40 % are satellites no longer in operation and spent rocket upper stages;**
 - **54% are fragments and other objects;**
- **300 000 objects between 1 and 10 cm**



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The space debris situation is a real concern.

- **The Chinese “experimental” ASAT test of January 11, 2007 produced a large amount of long lived space debris.**
- **The Feb 10, 2009 collision between Iridium 33 and Cosmos 2251 was a reminder that collisions in space can and do happen!**
- **Also, breakups of old spacecraft and GEO satellites failures contribute to the increasing population of space debris.**

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The deployment of weapons in space has not taken place so far but would present an additional threat.

Also, ground-based weapons can be used against low Earth orbit spacecraft.

If they were activated during a conflict, they would jeopardize the secure use of near-earth outer space.

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- **The continued development of outer space activities will also require:**
 - **better management of the frequency spectrum,**
 - **better coordination of space operations to avoid interference and collisions,**
 - **setting up international mechanisms to exchange space surveillance information.**
- **In other words, a better global governance system will be required.**

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Some thoughts on the role of UN COPUOS

The UN COPUOS has historically

concentrated on two lines of activities:

- Establishing the legal framework for space activities at the international level**
- Encouraging access to space applications for developing countries.**

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In December 2007, the UN General Assembly adopted a resolution (62/217) endorsing the UN COPUOS guidelines on space debris mitigation, largely based on the guidelines developed by the Inter Agency Space Debris Committee (IADC). Thus, an interagency set of technical recommendations acquired the political status of a text adopted by states.

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The growing population of space debris, and the threat that it represents for government as well as for private sector space assets, raises further questions: Outer Space is a common domain (« the province of all mankind ») which cannot be subject to national appropriation. How could we collectively agree on a set of rules to avoid space (and celestial bodies) gradually becoming a dangerous place to operate in or a junkyard?

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The future of space activities requires that adequate safeguard and procedures be agreed.

The « UN COPUOS space debris mitigation guidelines » are a first step in the right direction.

COPUOS needs to go further and address the issue of developing « Best Practices Guidelines » for outer space activities.

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- **The IAA has published in 2006 a study report on the concept of « space traffic management ».**
- **The concept was developed further by the IAASS with its report “An ICAO for space?” published in 2007.**
- **In parallel, commercial satellite operators such as Intelsat and Inmarsat have been talking actively about mechanisms to prevent interferences and potential collisions in the GEO orbit.**

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The UN COPUOS could play a significant role in developing “Best Practices Guidelines” with a bottom-up, technical approach, as for the space debris mitigation guidelines, rather than a political one.

This will require close coordination with commercial satellite operators.

Along this line, France will propose this coming June a new topic “Long Term Sustainability of Space Activities” to be included in the COPUOS agenda in 2010 and beyond.

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UN COPUOS is also playing an active role in areas such as :

- **Coordination of GNSS through the “International Coordination of GNSS” (ICG) coordination mechanism;**
- **Facilitating the use of space-based data and services in support of natural disasters mitigation (the UN SPIDER program).**

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Other areas of global governance where UN COPOS should become active are:

- **Environment protection on the surface of the Moon and other planets, possible concept of « common heritage » sites to be protected?**
- **Developing an appropriate legal regime for resource extraction on the Moon and other celestial bodies (taking lessons from the Law of the Sea).**
- **Examine the legal implications of commercial personal space flights and develop appropriate recommendations.**

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Conclusion

- **Continued space activities will require a better discipline on the part of all actors, civil and military, to preserve space as a safe and secure environment.**
- **The future security of space assets and space operations requires a concerted effort by all parties.**
- **UN COPUOS has a role to play.**

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Thank you for your attention.