

The future of space activities and the role of UN COPUOS

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Let us start from a brief review
of the situation of space
activities in the world 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;
- Russia is trying to find ways to become a great player again, building on its vast experience and its strong industrial base;
- China has now become a very significant player and is no longer hiding its ambitions (see new space policy announced on October 12, 2006 on http://news.xinhuanet.com/english/2006-10/12/content_5193446.htm)

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- Europe has difficulty defining a common space policy and particularly what should be its vision for space activities in the future.
- India has developed a very successful, applications oriented space programme and displays new ambitions in space science and exploration;
- Some developing countries are becoming more active participants (micro and mini satellites)

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What are the prime motivations for governments to invest in space activities?

There are three basic and interconnected motivations:

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

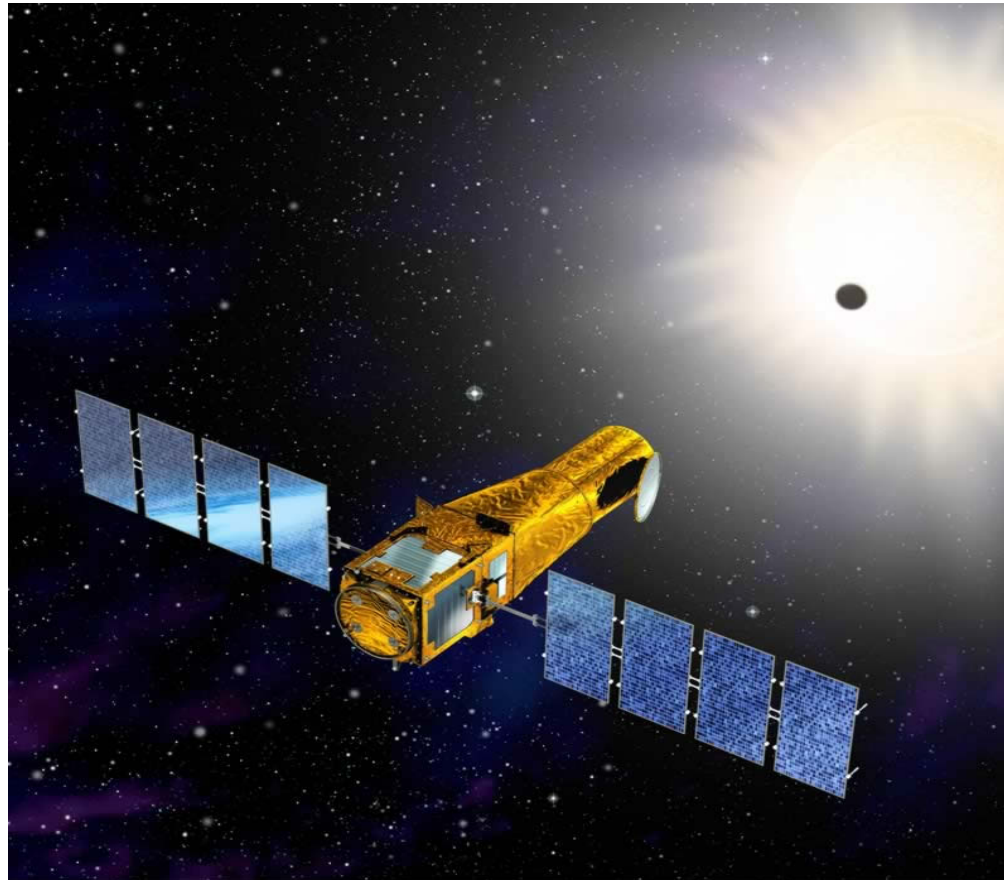
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1/ Scientific research and exploration are prime drivers for space activities.

- 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, to be launched next month (November 2006)



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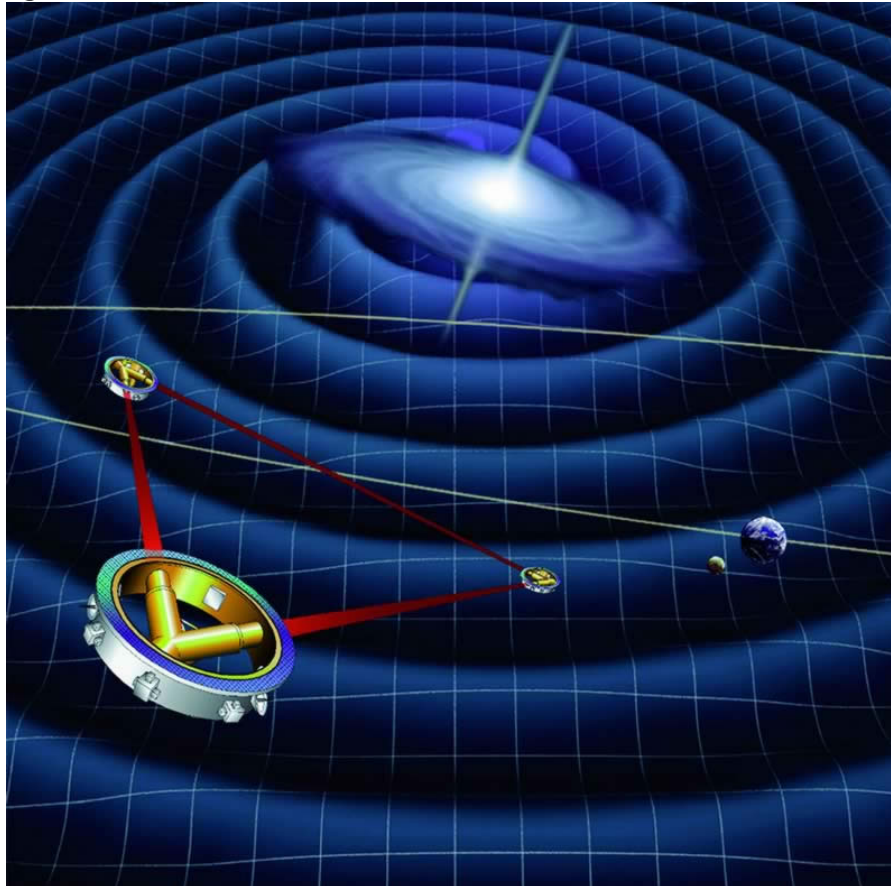
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The European Aurora program: roving on the surface of Mars...



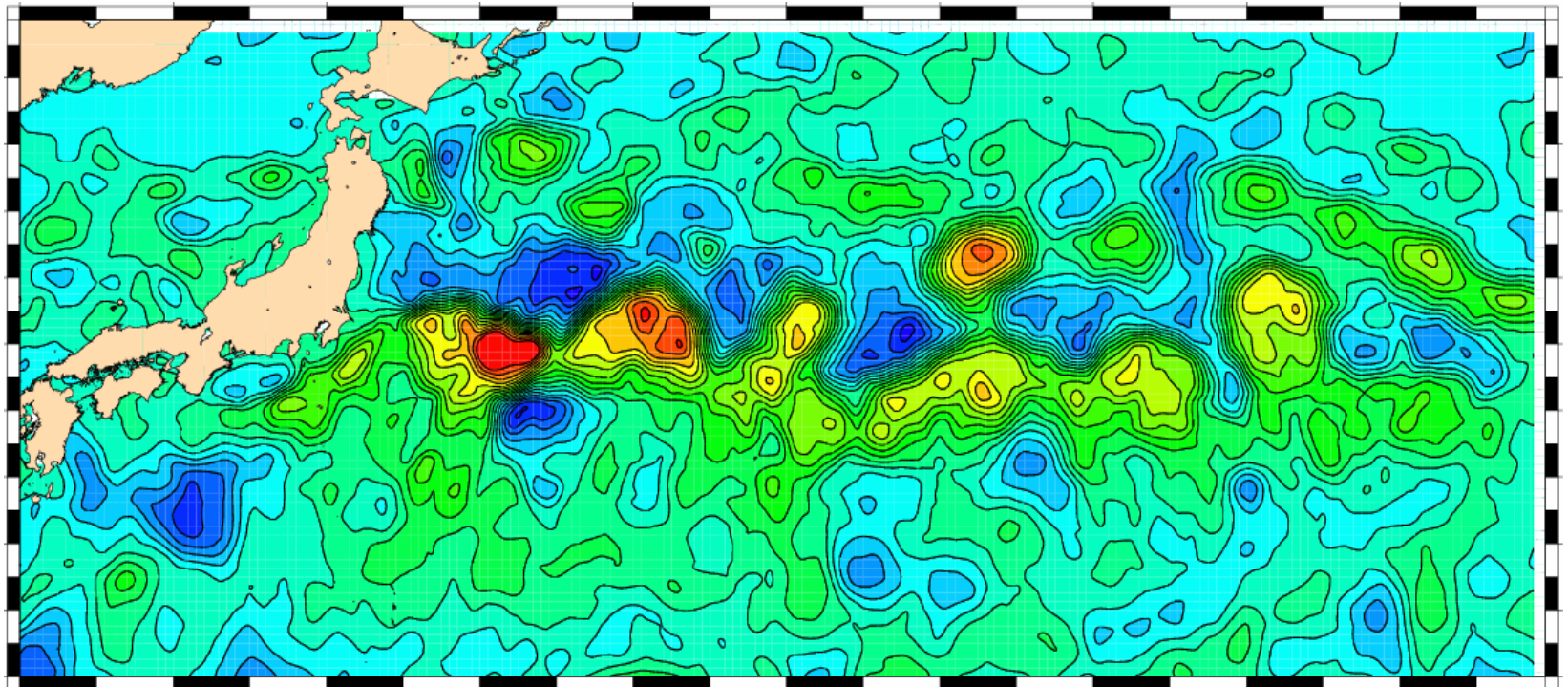
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Beyond our galaxy: Large base interferometry in
the solar system: Lisa



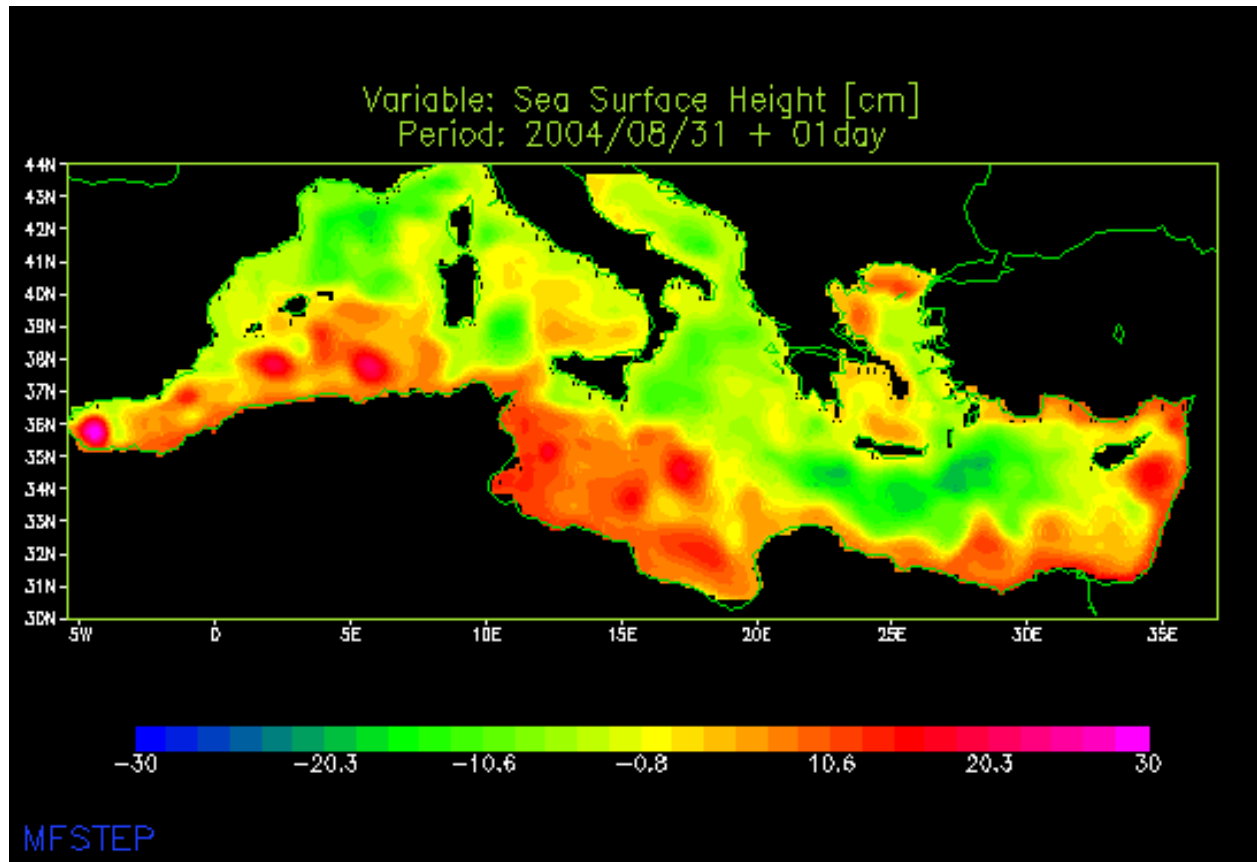
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Ocean circulation is a key to seasonal climate forecasting : Pacific ocean eddies as derived from Jason-1 and Envisat altimetric data



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Ocean circulation: sea surface height forecast in real time in the Mediterranean sea.



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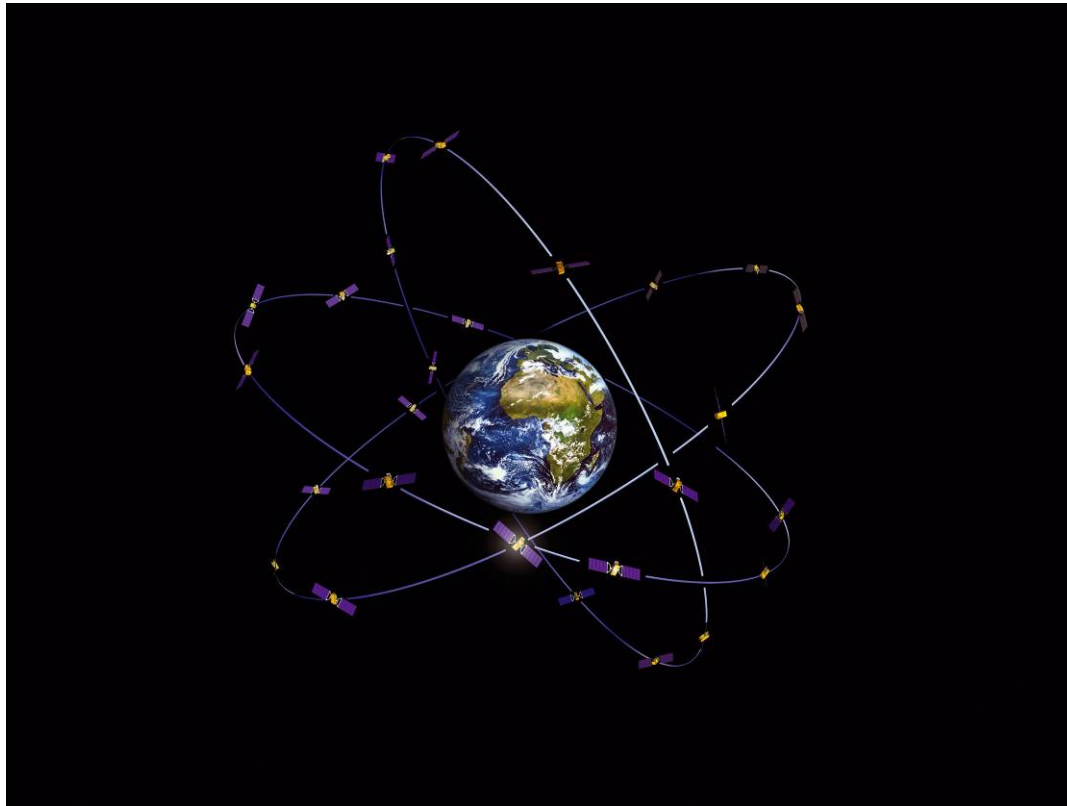
2/ Applications of space systems to satisfy society's needs include both:

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

They require a close connection with scientific research (e.g. weather and climate)

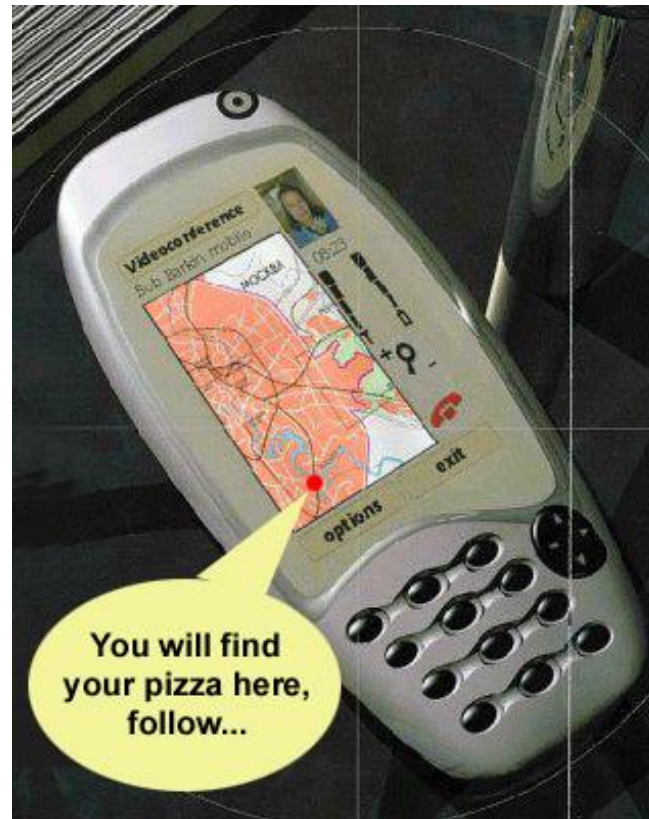
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The future European Galileo satellite navigation constellation is supposed to be supported by its user base



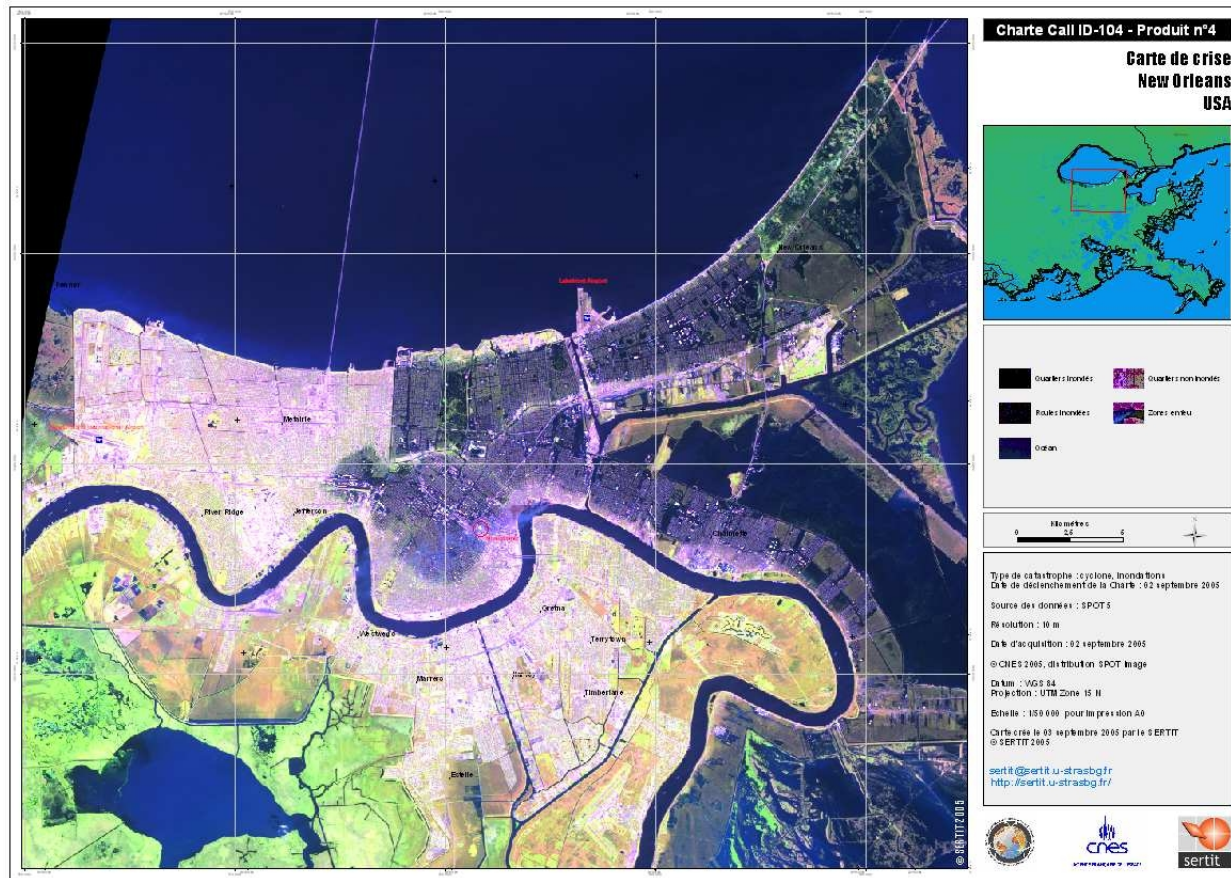
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An increasing number of applications combine navigation terminals with mobile telecoms.



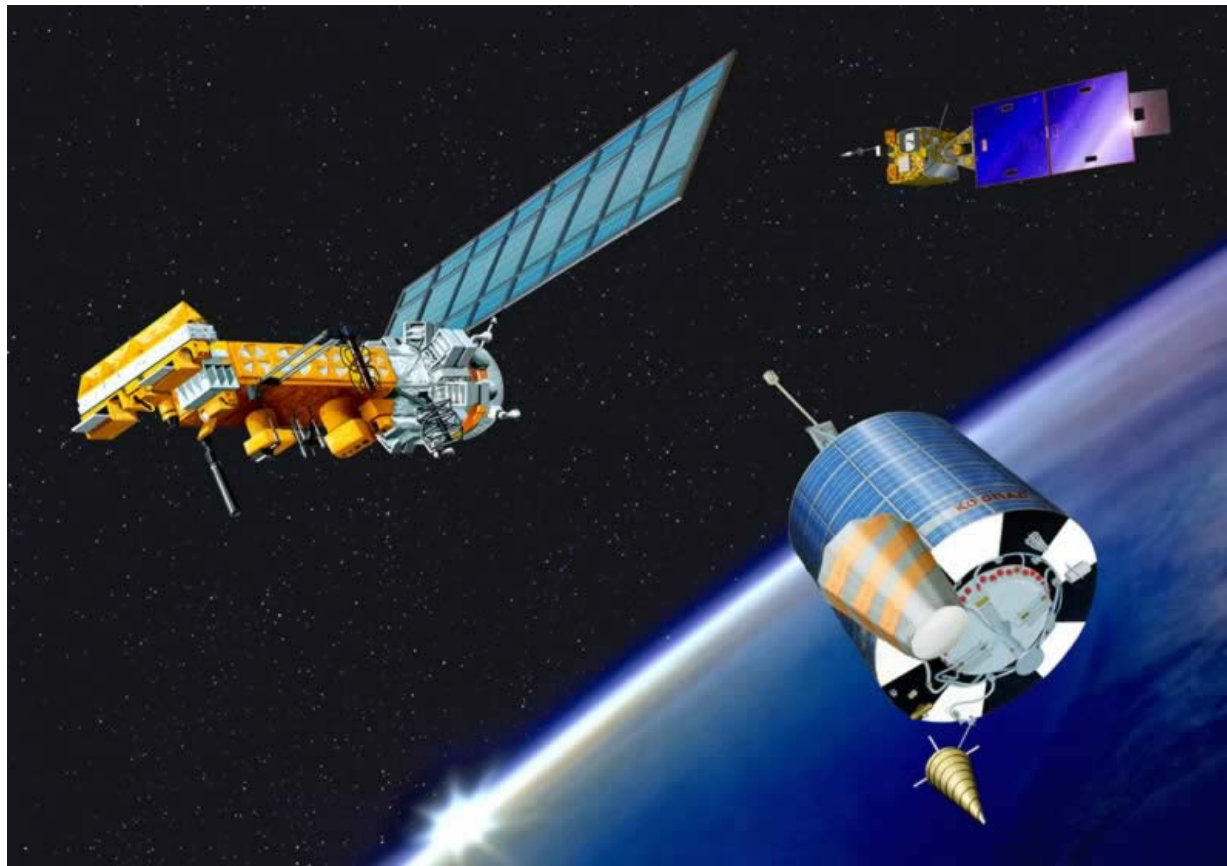
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Crisis image map, New Orleans flooding on
September 2, 2005



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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 17 000 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 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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What about manned space activities?

- They were driven by strategic considerations during the last forty 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 is driven by the need to reaffirm leadership.
- The urge « to go beyond the horizon » and to explore the solar system with manned missions is merely a selling point.

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Let us be honest: After almost fifty years of space activities, manned space missions have not been able to demonstrate their cost-effectiveness in any of the three main areas of space applications discussed above.

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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 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 about the role of the UN COPUOS in this new context?

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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Let us recall its fundamental role in developing the Outer Space Treaty of 1967, ratified by almost 90 countries, including all space actors. Four other international conventions have since been developed within COPUOS, three of them are widely ratified.

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They are:

- The Agreement on the Rescue of Astronaut, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968);
- The Convention on International Liability for Damage Caused by Space Objects (1972);
- The Convention on Registration of Objects Launched into Outer Space (1975);
- The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979), which has not been (and will not be) ratified by the main space faring nations.

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COPUOS has also developed a number of Principles, submitted and adopted by the UN General Assembly:

- Declaration of Legal Principles governing the Activities of States in the Exploration and use of Outer Space (1962)
- Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1982)
- Principles Relating to Remote Sensing of the Earth from Outer Space (1986)
- Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992)

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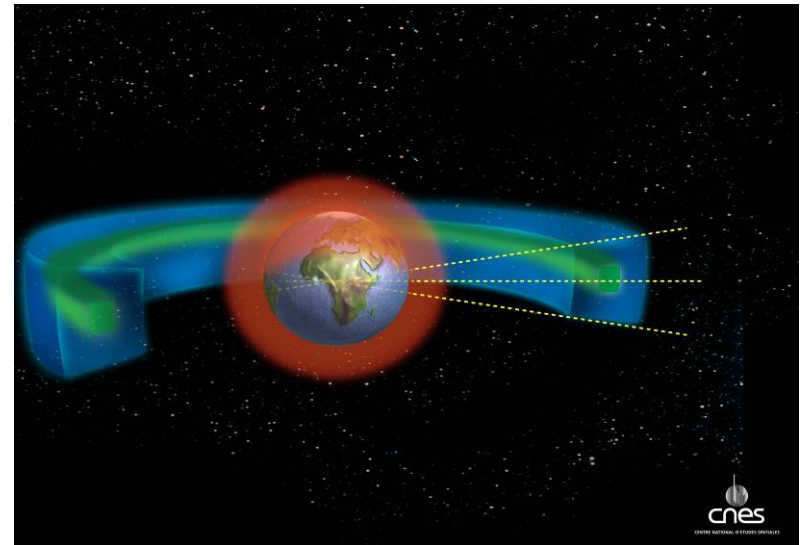
In 2007, COPUOS will submit to the UN General Assembly a new resolution on space debris mitigation, largely based on guidelines developed by the Inter Agency Space Debris Committee (IADC).

Thus, an interagency set of technical recommendations will acquire the political status of a text adopted by states.

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A summary of space debris situation today:

- 620 operational satellites
- 9000 identified objects larger than 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
- several millions below 1cm?



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

COPUOS needs to go further and address the issue of developing « rules of the road » for space operations.

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- The IAA has published in 2006 an interesting study report on the concept of « space traffic management ».
- In parallel, commercial satellite operators such as Intelsat and Inmarsat are talking about the need for « rules of the road » to prevent collisions in the GEO orbit.
- A possible link with the PAROS discussions at the Conference on Disarmament?

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The UN COPUOS could play a significant role in developing such rules of the road, provided that it addresses them from a technical angle (as for the space debris mitigation) rather than from a political angle.

In June 2007, I intend to propose this topic as a new item to be addressed by COPUOS in the years to come. Hopefully, member states delegations will take a positive view on this proposal.

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COPUOS could (should) also address in the future such issues as :

- 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?)
- Facilitate international cooperation in new space ventures such as space exploration. In particular, find a mechanism to engage the younger generation in the developing countries.
- Examine the legal implications of space tourism and develop appropriate recommendations.
- A decision making mechanism for protection against Near Earth Objects?

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Conclusion (1)

Civil space activities in the 21st century will be driven by two distinct lines of development:

- Participate in space exploration efforts, either in cooperation with the US or in competition with them, with a strong « discovery » component;
- Concentrate on space applications of direct use to society (see OECD report: « Tackling society's challenges », 2005)

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Conclusion (2)

Continued space activities will require a better discipline on the part of all actors, civil and military, to preserve space as a safe 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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In the 21st Century, outer space will continue to be an exciting story with its unique mixture of strategic considerations, technological challenges, scientific discoveries and contribution to daily applications.

UN COPUOS should be able to continue contributing to this exciting story, as it has done in the early years.

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Thank you for your attention.