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International Global Monitoring Aerospace System

IGMASS - New Approach to the Disaster Management Issue

Committee of Peaceful Uses of Outer Space
Fifty-Third Session

Vienna, June 17, 2010

Eyjafjallajökull Volcano Eruption



As a result of the Icelandic Eyjafjallajökull volcano week lasting eruption European airlines daily lost up to 200 million Euros. According to the International Air Transport Association the total losses of airports and airlines in those days exceeded 1.7 billion Euros. Over 7 million passengers were total affected

Ecological Disaster at the Mexican Gulf

Technogenic, ecological disaster continues to unfold in the Gulf of Mexico off the coast of the U.S., where on April 20, 2010 oil pipe burst, which led to leakage of oil, and then oil platform “Deepwater Horizon”, owned by Swiss Transocean company leased to the British oil corporation British Petroleum (BP) sank. Reality - this is an oil slick, which area daily increases by tens of square kilometers. The elimination of water pollution and coastal areas as well as compensation for damage from oil spills, according to experts, would cost its perpetrators in at least 12 billion US dollars.

"We can rightly be called the catastrophe" oil Chernobyl ", - said the Greenpeace representative.

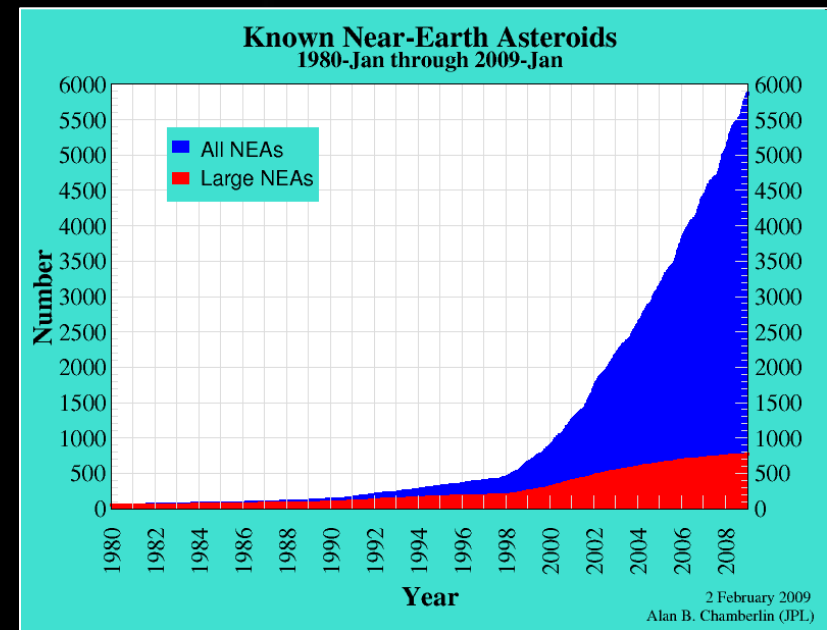


Global Outer Space Risks and Threats

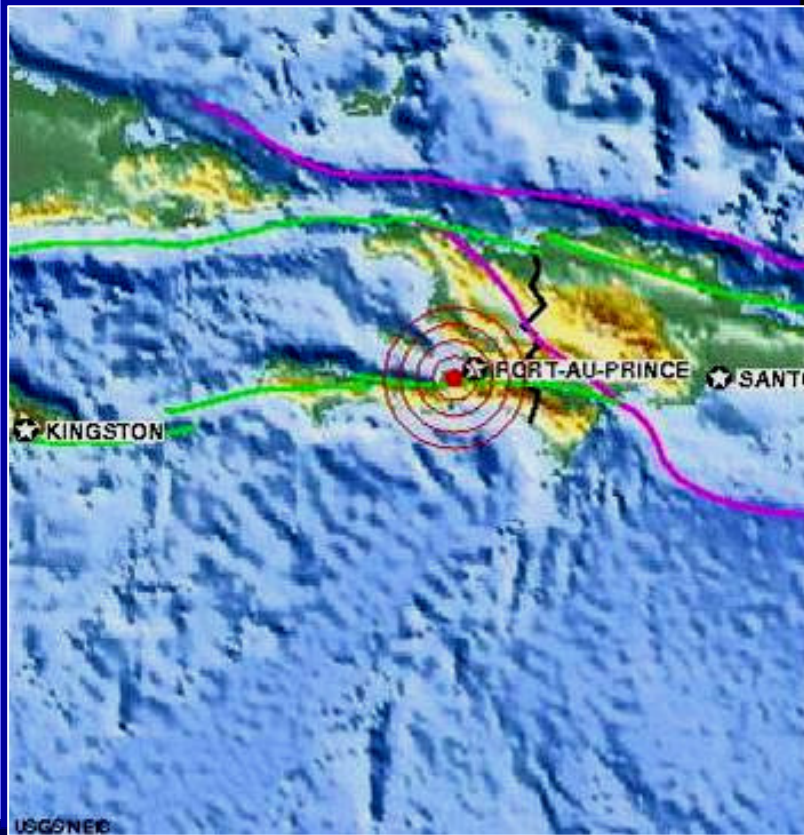
On October 8, 2009, Earth approaching unobserved asteroid busted at upper atmosphere (15-20 km.) directly under South Sulawesi province (Indonesia). According NASA, this fatal destruction of 10 m size stone object, which entered into dense atmosphere on the speed more than 20 km per second, realized energy 50 thousands tons TNT equivalent (three times more powerful than Hiroshima nuclear blast).

The event was fixed by West Ontario University Observatory, distant 16000 km. away from its epicenter.

Now, we know about dozens asteroids and comets approaching our planet (for example, 99942 Apophis, 1997VRZ, 1994 WK12), which in case of its fall down into the Earth, could trigger off global catastrophe.



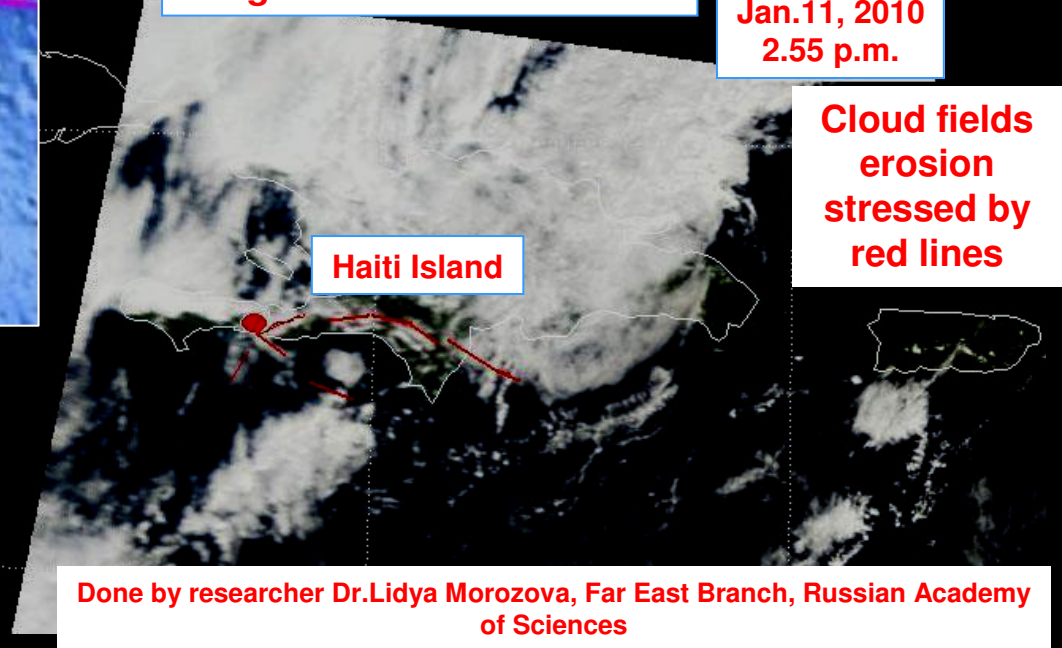
Some Signs of Recent Haiti Disaster



Results of satellite image with cloudy fields anomalies upper activated subduction zones just before earthquake, which appeared more than day before the disaster

Image from TERRA Satellite

Jan.11, 2010
2.55 p.m.



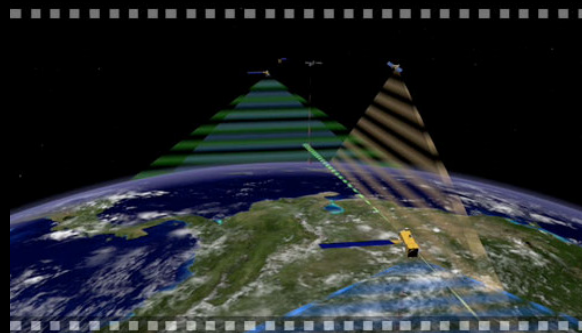
Done by researcher Dr.Lidya Morozova, Far East Branch, Russian Academy of Sciences

IGMASS - What Does It Mean?

International Global Aerospace Monitoring System (IGMASS) is large organizational and technical system, integrating itself side by side especially designing and creating space constellation of small **and micro** satellites **with onboard equipment to monitor and detect** early signs of destructing emergencies and existing and **advanced** national and international airborne and ground facilities (contact and distant sensors), Earth **observation facilities, meteorological, space communications and navigation** systems (or especially allocated informational or organizing and technical resources), including appropriate launch, control and satellite acquisition devices and infrastructure, variety of receiving and processing monitoring data equipment.

IGMASS' Creation Purpose

forehanded warning of world community about risks and threats of natural disasters and man-caused emergencies, next step forward development and integration of planetary informational and navigation-telecommunication recourses for global threats protection and solving of general humanitarian issues



IGMASS' Applicability

global and efficient forecasting of natural disasters and man-caused emergencies on the Earth and at outer space on the basis of integrated utilization of world wide space monitoring potential

IGMASS' Priority Missions

Permanent and continuous space monitoring of the Earth lithosphere, atmosphere, ionosphere and outer space with the purpose of revelation early signs of dangerous natural disasters and man-caused emergencies



Collecting, onboard satellite processing and transmitting monitoring data into ground space information receiving stations



Generalising and integrated processing global monitoring data, which has been collected from space-based, air-born and ground facilities, at national, regional and international emergency centres; monitoring information interpretation, storage and visual displaying



Near real-time communication to states concerned and specialized UN structures about educible natural and man-made risks and threats

IGMASS' Advanced Missions

Proper navigational and telecommunicating acquisition consumers all over the world for emergency operations, catastrophe's medicine, humanitarian operations; transport Corridors systems creation, optimisation cargo and people transfer; abolition of illiteracy, preservation of cultural values, distant learning concept and experts training development



Effective warning about global risks and threats in and from outer space: asteroid danger and anomaly phenomena



Gradual forming unified planetary “informational environment of security” for the convenience of reducing global risks and arising threats protection

IGMASS Structure

SPIDER-UN

GEOS

KOSPAS-SARSAT

GMES

Sentinel Asia

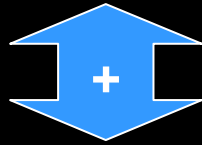
DMC

GCOS

Disaster Charter

IONOSAT ...

International, regional and national projects and programmes of monitoring of natural disasters and emergencies



International, regional and national space systems

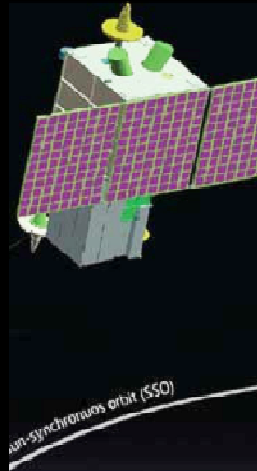
Meteorological

Navigational

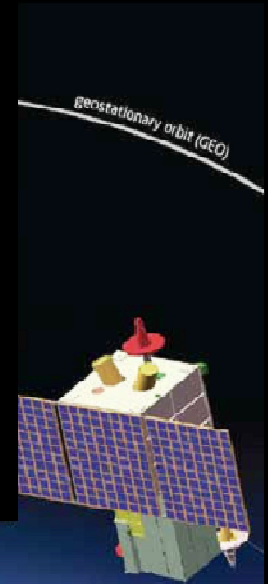
Observation and RSC

Communication

International, regional and national ground facilities (contact and distant sensors) for monitoring natural disasters and outer space



Own Developed IGMASS Orbital Segment:
small, micro monitoring satellites, equipped by variety of advanced instruments for detection early signs of natural disasters and technogenic catastrophes



Air-born segment

NATIONAL AVIATION CONSTELLATIONS FOR EARTH OBSERVATION

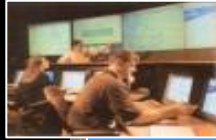


IGMASS Ground Segment: International Monitoring Data stations, International and Regional Crisis Management Centers; Launching and Flight Control facilities, Global Distant Learning etc and Catastrophe's Medicine Communication Infrastructure

Monitoring Information Management Hierarchy



UN



INTERNATIONAL CRISIS MANAGEMENT CENTRES

UPPER LEVEL: utilization of monitoring information

NATIONAL AND REGIONAL EMERGENCIES FORCES



NATIONAL AND REGIONAL CENTRES CRISIS MANAGEMENT

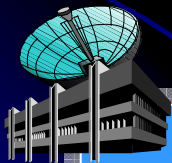


REGIONAL CENTRES OF AIRBORNE AND GROUND SENSORS MONITORING DATA COLLECTING AND PROCEEDING



MEDIUM LEVEL: interpretation of monitoring data

NATIONAL AND REGIONAL MONITORING DATA RECEIVING STATIONS



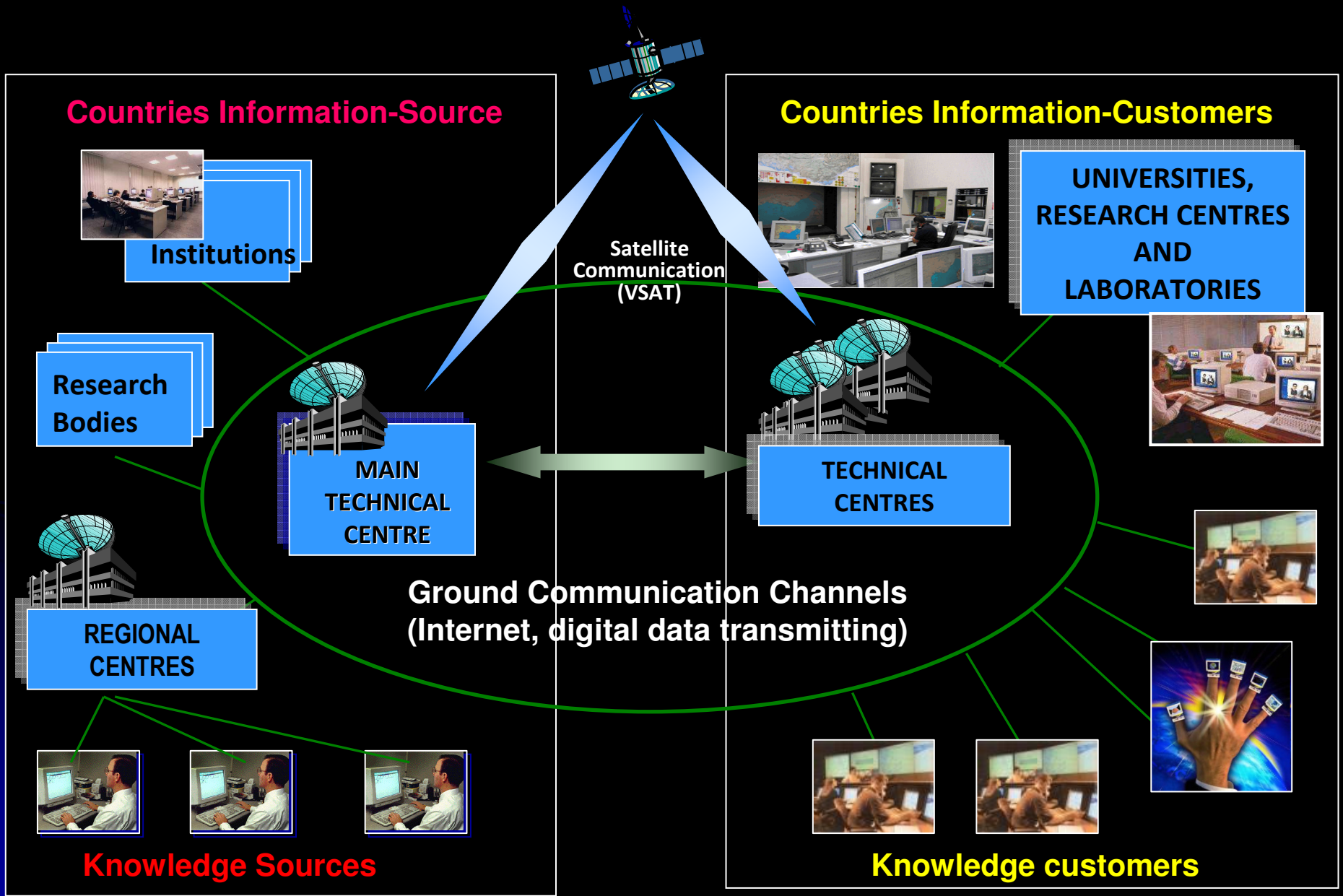
International, regional and national ground facilities (contact and distant sensors)



INTERNATIONAL MONITORING DATA RECEIVING STATIONS (5 stations all over the world)

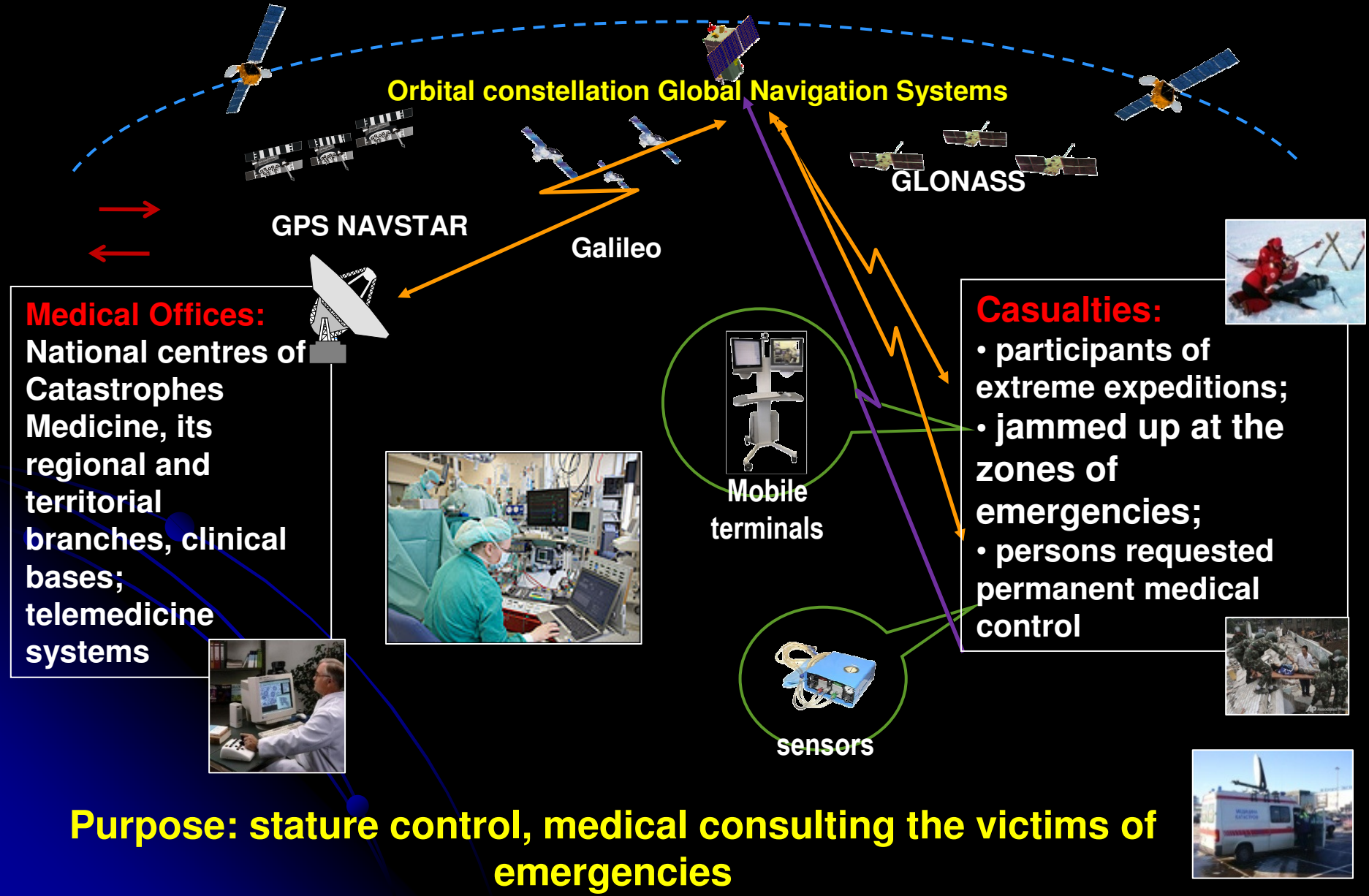
LOW LEVEL: receiving and proceeding of monitoring data

Distant Learning IGMASS Subsystem

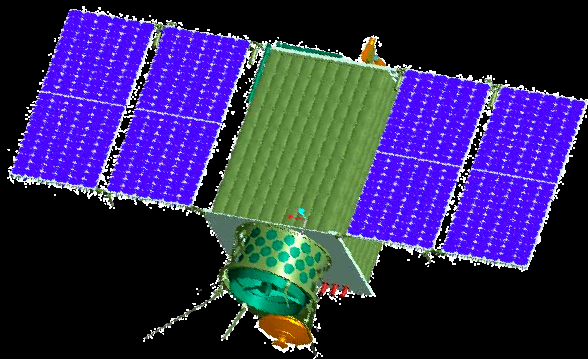


Catastrophe Medicine IGMASS Subsystem

Orbital Constellation of International, Regional and Domestic Telecommunication Systems



Own Developed IGMASS Orbital Segment



Main satellite characteristics

Mass (max): 120 - 400 kg;

Mass of payload: 40÷120 kg.

Lifetime: Satellite of upper level – up to 10 years,
Satellite of lower level – 5 - 7 years

Orbital structure:

Number of satellites in constellation:

Satellite of upper level – 6,

Satellite of lower level – 3-4.

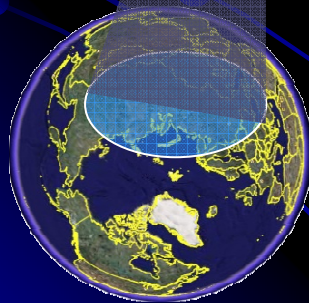
Orbits:

Satellite of upper level – GEO with even distribution of satellites in orbit plane,

Satellite of upper level – SSO, H=600-700 km, with even distribution of orbit planes along longitude of ascending node

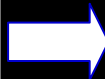
Payload

Highly sensitive radiometric visible and IR range equipment, low (LF) and high frequency (HF) wave complexes, plasma complexes, complexes to monitor charged particles, magnetometer, mass-analyzers, spectrometers



IGMASS Project Initialization

Presenting on profile International scientific forums



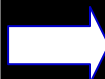
Dnepropetrovsk, Ukraine (2007, 2009); Korolyov, Russia; Tunis; Shanghai, China (2008); Versailles, France (2009); Rome, Italy; Haifa, Israel; Paris, France; Moscow and Kazan, Russia; Donetsk, Ukraine; Beijing, China; Bonn, Germany (2010)

Official presenting to the International Academy of Astronautics (IAA)



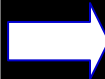
Glasgow, Scotland (2008)

Project Manager Assignment and IGMASS' working experts group creation (from IAA)



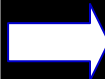
Paris, France (2009)

Project Researches and preparing of IGMASS' working experts group conclusion



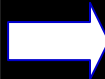
Yubileynyy, Russia (2009)

Submitting Project Researches and IGMASS' working experts group conclusion to the IAA



Daejon, Republic of Korea (2009)

Project detailed discussion and making decision about its submitting to the UN



Limassol, Cyprus (2009)

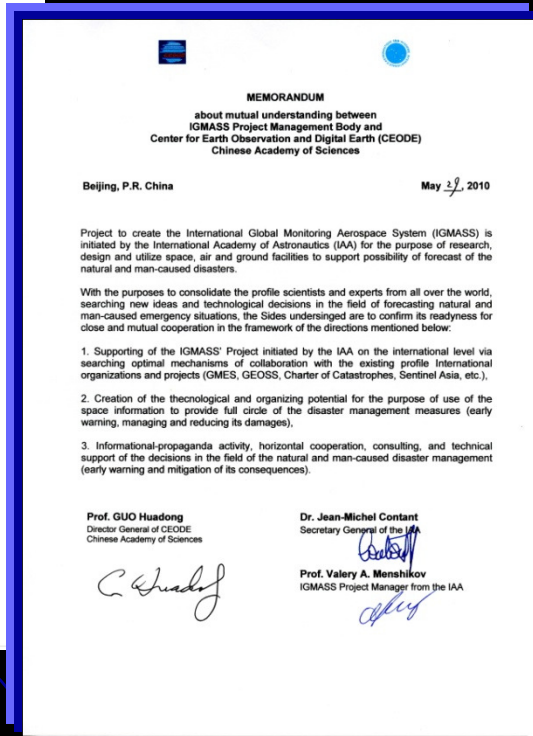
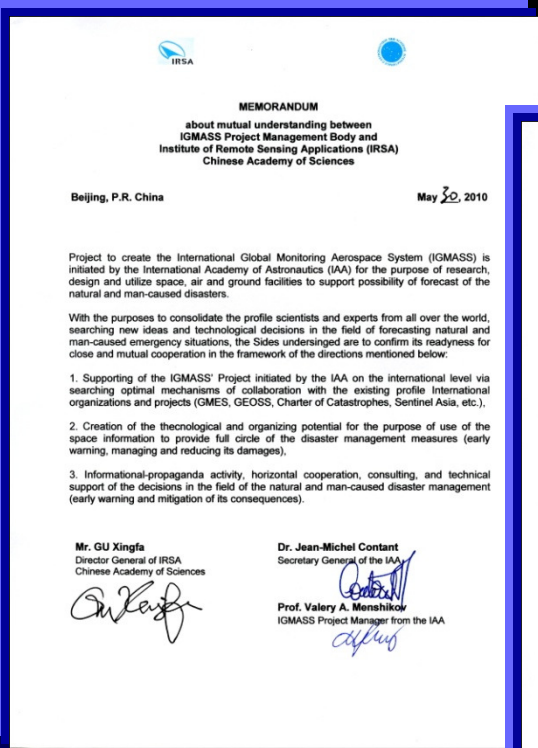
Project submitting to the UN level (STS COPUOS)



Vienna, Austria (2010)

Some Results of IGMASS Realization

✓ Wide-spectrum nonmaterial research on the Project including foreign expert participation are carrying out



✓ Active promotion of IGMASS Project on International level

International Support of the IGMASS Project



April 28, 2010

...I would like to confirm the interest and the full support of GEO Secretariat for this initiative.

The Programme Manager of the GEO Secretariat will be delighted to...start the procedure of acknowledgment of IGMASS as Participating Organization of GEO.

The objective of IGMASS to develop an aerospace system for the assessment and forecasting of geophysical phenomena and natural/man-made disasters should take full advantage of the Societal Benefit Area of the Disasters in GEOSS.



A handwritten signature in black ink, which appears to be 'JA', located below the text of José Achache.

José Achache
GEO Secretariat Director

International Support of the IGMASS Project

June 15, 2010



...The topic of this Second International Specialized Symposium [in Riga, Latvia on the topic of IGMASS issues] is well chosen. It is a shared responsibility of all stakeholders to, first of all, analyze what the threats are to the global security of mankind and which measures can, and should, be taken in order to avoid them, or at least mitigate their impact. Space tools provide essential elements in better understanding the overall environment as well as specific events.

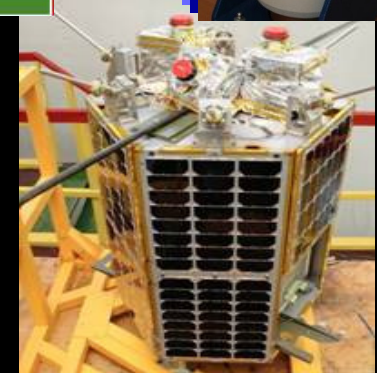
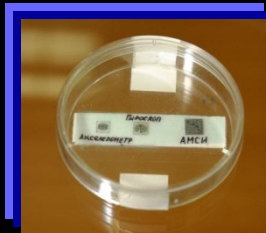
It is a stated objective of the Agency to actively participate in tackling the problems that face us, or may face us. This cannot be achieved without increased international cooperation. The International Global Monitoring Aerospace System (IGMASS) can play an important role in this respect.



Chris de Cooker
Head of the International Relations Department,
European Space Agency

Some Results of IGMASS Realization

- ✓ development engineering on creation of Multifunctional Space System of the Union State “Russia-Belorussia” as a foretype of IGMASS key segments are pursuing



- ✓ Specialized ground infrastructure of receiving and processing IGMASS space monitoring information are deploying and testing

- ✓ Designed predictable patterns of small satellite prototypes for own developed IGMASS Orbital Segment are testing

IGMASS Project Potential Efficiency

HUMANITARIAN

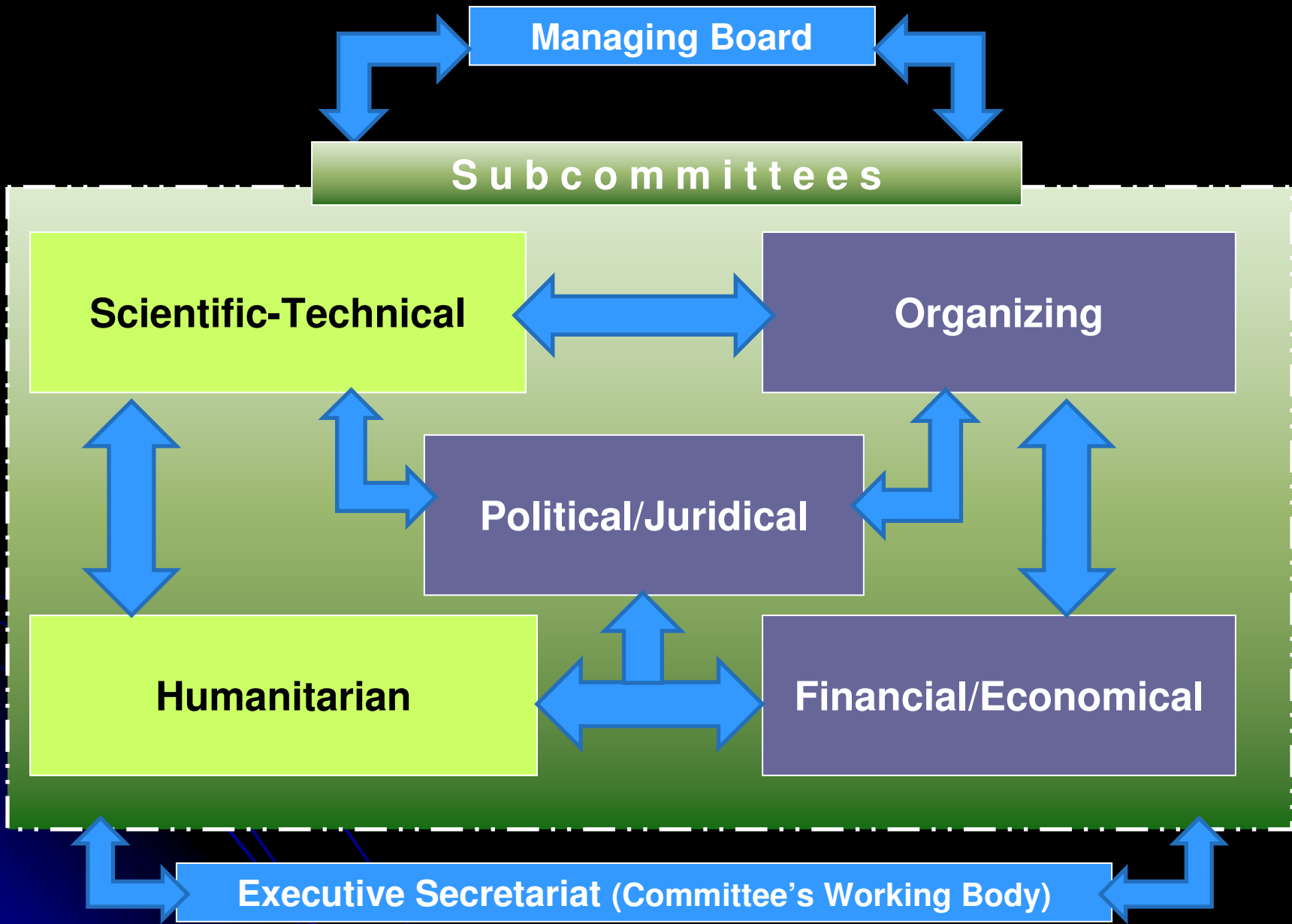


- preservation of the people's life and health due to early warning about global natural disasters and emergencies, delivery of extremely health care in case of its uprising and development;
- opportunities on making-up and realization complex of measures on parrying global natural and man-made risks and threats in the framework of spectrum of all possible approaches

FINANCE-ECONOMICAL

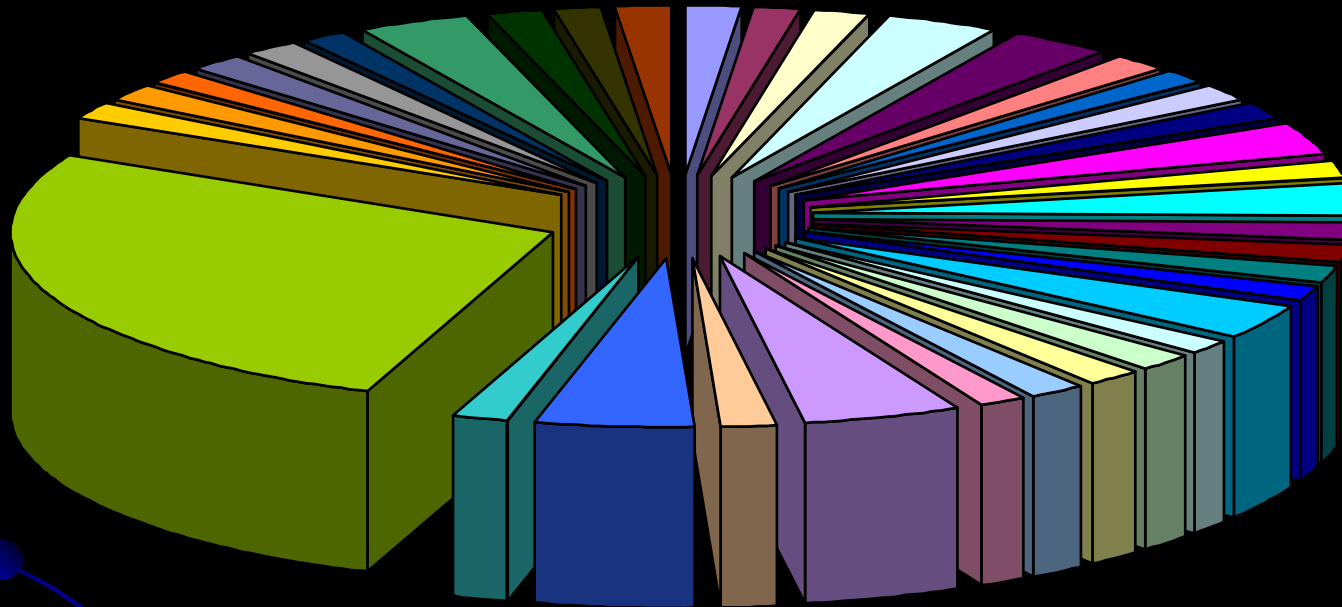


- maintenance of scientific, technological and technical potential of space-rocket industries of the countries-Project participants (construction of new capacities, business spreading etc.)
- preserving and sustaining financial and other aids and appliances courtesy of reducing consequences of natural and man-made emergencies;
- profit earning from monitoring data commercial realisation and using of business opportunities of distant education



Structure of the International Committee on IGMASS Project Implementation

Proposed Membership of International Committee on IGMASS Project Implementation



Australia	Argentina	Bangladesh	Belorussia	Bulgaria	Hungary	Germany	Greece
Georgia	EU	Israel	India	Irac	Italy	Kazakstan	Camerun
Canada	Kenya	China	Kyrgyzstan	Latvia	Myanmar	Nigeria	Norway
UN	Poland	Russia	CIS	USA	Tajikistan	Taiwan	Tunis
Turkey	Ukraine	France	Sweden	Japan			

Second Specialized International Symposium “SPACE & SECURITY OF HUMANITY” Programme

July 5, Monday

09.00-10.00	Registration of Symposium's delegates
10.00-11.00	Symposium's Inauguration Ceremony with the participation of Honorable Guests
11.00-13.00	Plenary Session
13.00-14.00	Lunch Break
14.00-16.00	Technical Sessions, IPCI Consistent Seminar
16.00-16.30	Coffee Break
16.30-18.00	Technical Sessions, IAA Working Group Meeting
18.00-18.30	Press Briefing
19.00-21.00	Welcome Reception

July 6, Tuesday

09.00-10.30	Technical Sessions, IAA Working Group Meeting
10.30-11.00	Coffee Break
11.00-12.30	Technical Sessions, IPCI Consistent Seminar
12.30-13.30	Lunch Break
13.30-15.00	Technical Sessions, IAA Working Group Meeting
15.00	Guided tour on Old Riga (historical sights)

July 7, Wednesday

09.00-10.30	Technical Sessions
10.30-11.00	Coffee Break
11.00-12.30	Technical Sessions, IAA Working Group Meeting; IPCI Meeting
12.45-13.30	Conclusion Plenary Session (adoption of main Symposium's documents) Spreading of Honorable Awards of IAA and RACTs. Introducing of new-elected members and Corresponding members of IAA and RACTs.
13.30-15.00	Conclusion Glass of Wine

July 8-9, Thursday-Friday***

Travelling Seminar “MNT & Joint Space Projects” on a board of ferry craft “FESTIVAL”, visiting Swedish Academy of Sciences and Stockholm profile enterprises, meetings, excursions, scientific and cultural events, open discussions etc.

INVITATION

Main information partner:
Maksimov Space Systems Research and Development Institute -
branch of Khronichev State Research and Production Space Center

2010 Riga
Specialized Symposium

2nd International Specialized Symposium
**SPACE
GLOBAL SECURITY &
OF HUMANITY**

5-9 of July, 2010
Riga, Latvia

Dear Ladies and Gentlemen,
We are glad to invite you to the 2nd International Symposium "Space and Global Security of Humanity"

Venue: Transport and Telecommunication Institute (TSI)
1, Lomonosov st., Riga, LV-1019, Riga, Latvia

Date: 5-9 July, 2010

Beginning of Registration – July 5, 2010, since 09:00 a.m.

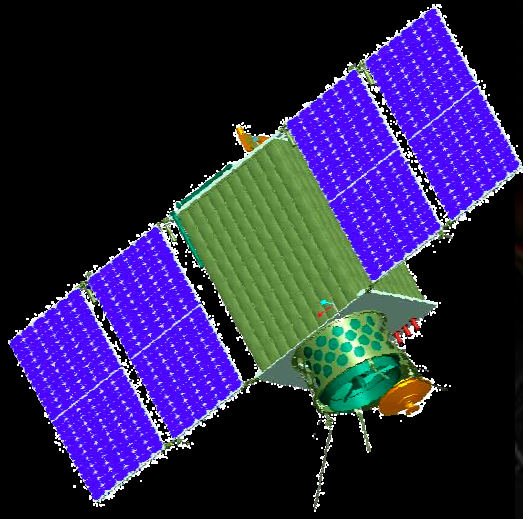
Organizers:

- International Academy of Astronautics (IAA)
- Russian Academy of Cosmonautics named after Konstantin E. Tsyolkovsky (RACTs)
- International Association ZNANIE
- Transport and Telecommunication Institute (TSI), Latvia


www.spacesystems.ru

** In the framework of separate programme.

Important Note: The Symposium Programme mentioned below is changeable. Follow Organizing Committee guidance, please.



IGMASS Project is an opportunity of unifying world community efforts in the framework of new, joint strategy of peaceful space exploration, which is focusing into providing secure and social sustainable development of globe society in XXI century, based on common and imperishable values of joint, irreversible solving global issues of modern Humanity and preserving the life on the Planet; prospects of strengthening political, diplomatic, economical and scientific positions of countries-participants of IGMASS Project on the ways of parrying unexpectedness's and abruptness's (risks and threats) of contemporary world



**For obtaining additional information about IGMASS
Project, please, contact us:**

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***Prof. Valeriy A. Menshikov – Project IAA Manager and Research
Supervisor***

***For future cooperation contact also to Russian Space Agency
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E-mail: press@roscosmos.ru