

# International cooperation in space

***Simonetta Di Pippo***

President and co-founder WIA Europe  
Head, European Space Policy Observatory  
at ASI Brussels



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An aerial photograph of a rocket launch. The rocket is a vertical column of bright yellow and orange fire and white smoke, ascending from a launch pad. The launch pad is visible as a complex of structures and roads at the bottom of the frame. The surrounding landscape is a mix of green fields and brownish terrain, with a network of roads and power lines. The sky is a clear, pale blue. The text is overlaid on the left side of the image.

**What** is cooperation about?

**Why** cooperation is so important in space?

**How** different experiences can shape the future of space activities?



# ISS Operations and Management



Credits NASA

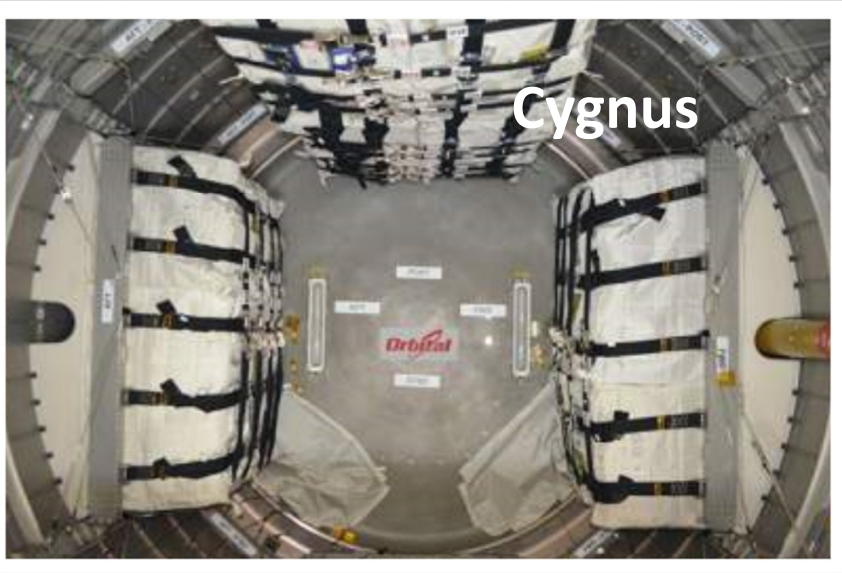




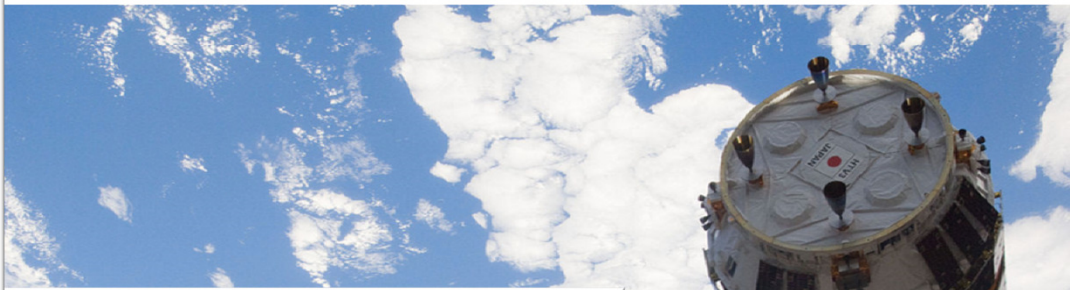
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Dragon



Cygnus



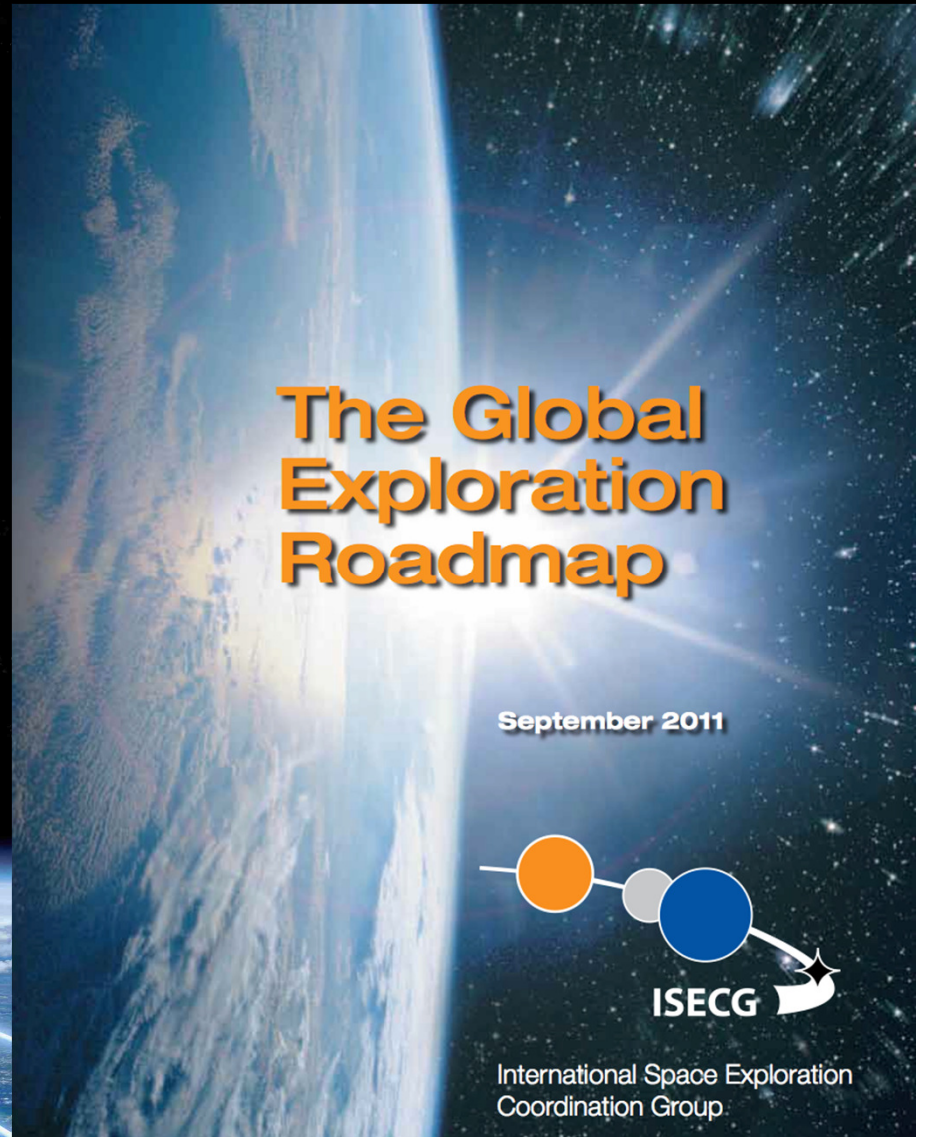
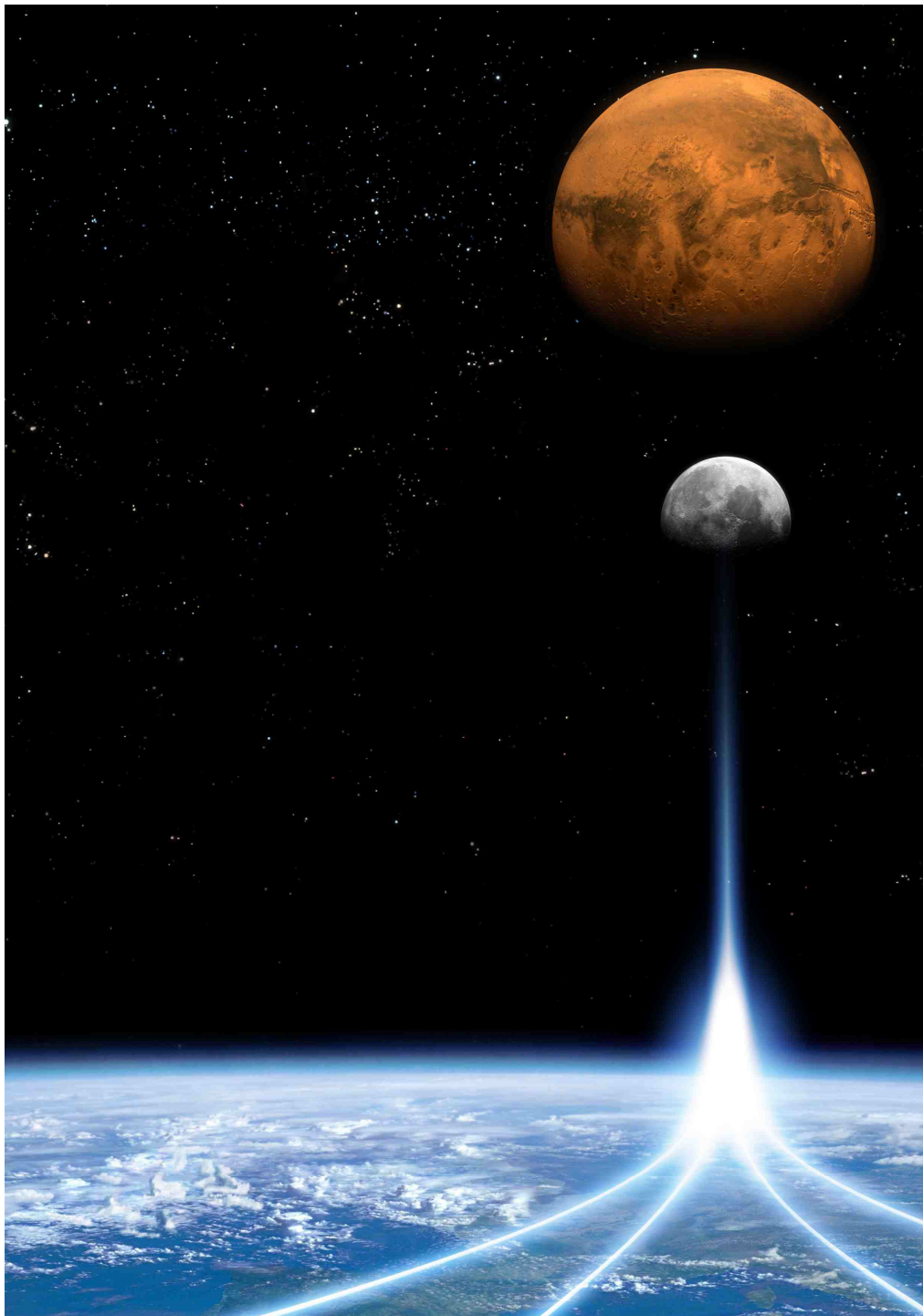
HTV



Progress

# THE GLOBAL EXPLORATION STRATEGY:

THE FRAMEWORK FOR COORDINATION



## The Global Exploration Roadmap

September 2011



ISECG

International Space Exploration  
Coordination Group

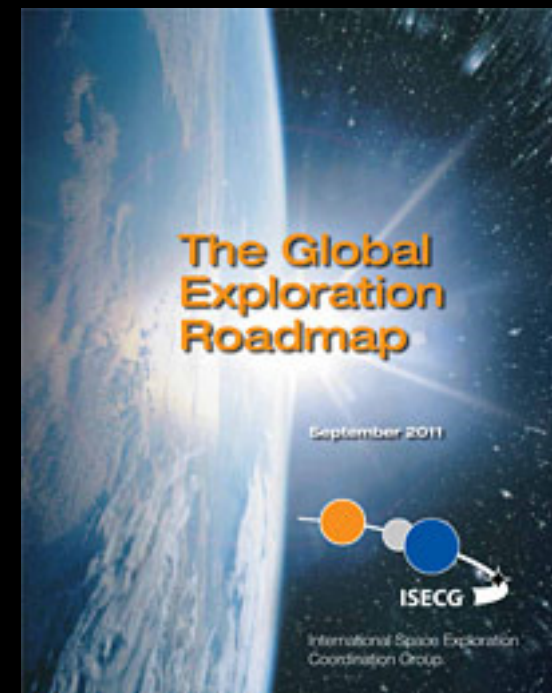
The Global Exploration Strategy: the Framework for Coordination, released in May 2007 by 14 space agencies, presents a vision for globally coordinated human and robotic space exploration focused on solar system destinations where humans may someday live and work.

It calls for sustainable human exploration of the Moon, near-Earth asteroids, and Mars.

Although Mars is unquestionably the most intriguing destination for human missions currently within our grasp, and a human mission to Mars has been the driving long-term goal for the development of the Global Exploration Roadmap, there is much work to be done before the risks associated with such missions can be reduced to an acceptable level and the required technologies are matured to enable a sustainable approach.



**International Space Exploration  
Coordination Group**

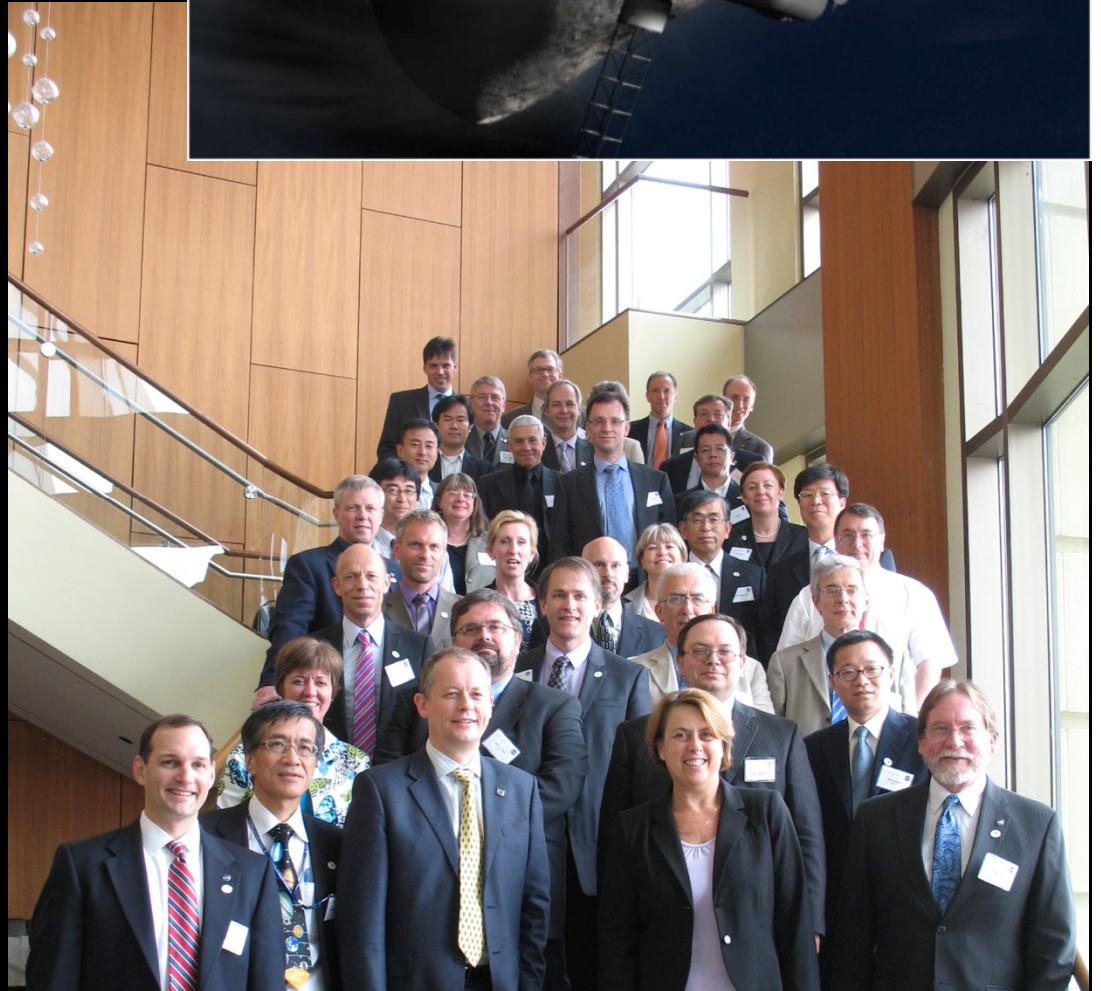






# Global Exploration Strategy Destinations!

GER2 under elaboration to develop a more converging scenario, expected mid 2013





**Space in Europe:  
cooperation by definition**

# European space activities: a matter of international cooperation

- Space programmes are a concrete and successful example of European (international) cooperation carried out by an intergovernmental organisation such as ESA;
- Since 1975 European States (in a growing number) are pooling their resources to define and implement space activities at European level;
- Mandatory and optional programs;
- “Juste Retour” (guaranteed industrial return) is a major driver for this successful cooperation;

**ESA has 20 Member States: 18 states of the EU (AT, BE, CZ, DE, DK, ES, FI, FR, IT, GR, IE, LU, NL, P, PT, RO, SE, UK) plus Norway and Switzerland.**

Eight other EU states have Cooperation Agreements with ESA: Estonia, Slovenia, Hungary, Cyprus, Latvia, Lithuania, Malta and the Slovak Republic. Bulgaria is negotiating a Cooperation Agreement.

Canada takes part in some programmes under a Cooperation Agreement.



# Europe in Space: many players, many different levels

- European cooperation in space is articulated in several different levels:
  - National space agencies – some of which retaining an important part of their budget for national programmes and cooperate bilaterally
  - European Space Agency
  - European Union
- Eumetsat (1986, 25 members and associated states) and Eutelsat (48 MS) to be taken into the picture too

# Europe in Space: many players, many different levels

- The European Commission is a recent player (e.g. Galileo and GMES) but also some of its current and new agencies such as:
  - European Defence Agency (EDA);
  - GNSS (Galileo) Supervisory Authority - GSA successor to the Galileo Joint Undertaking

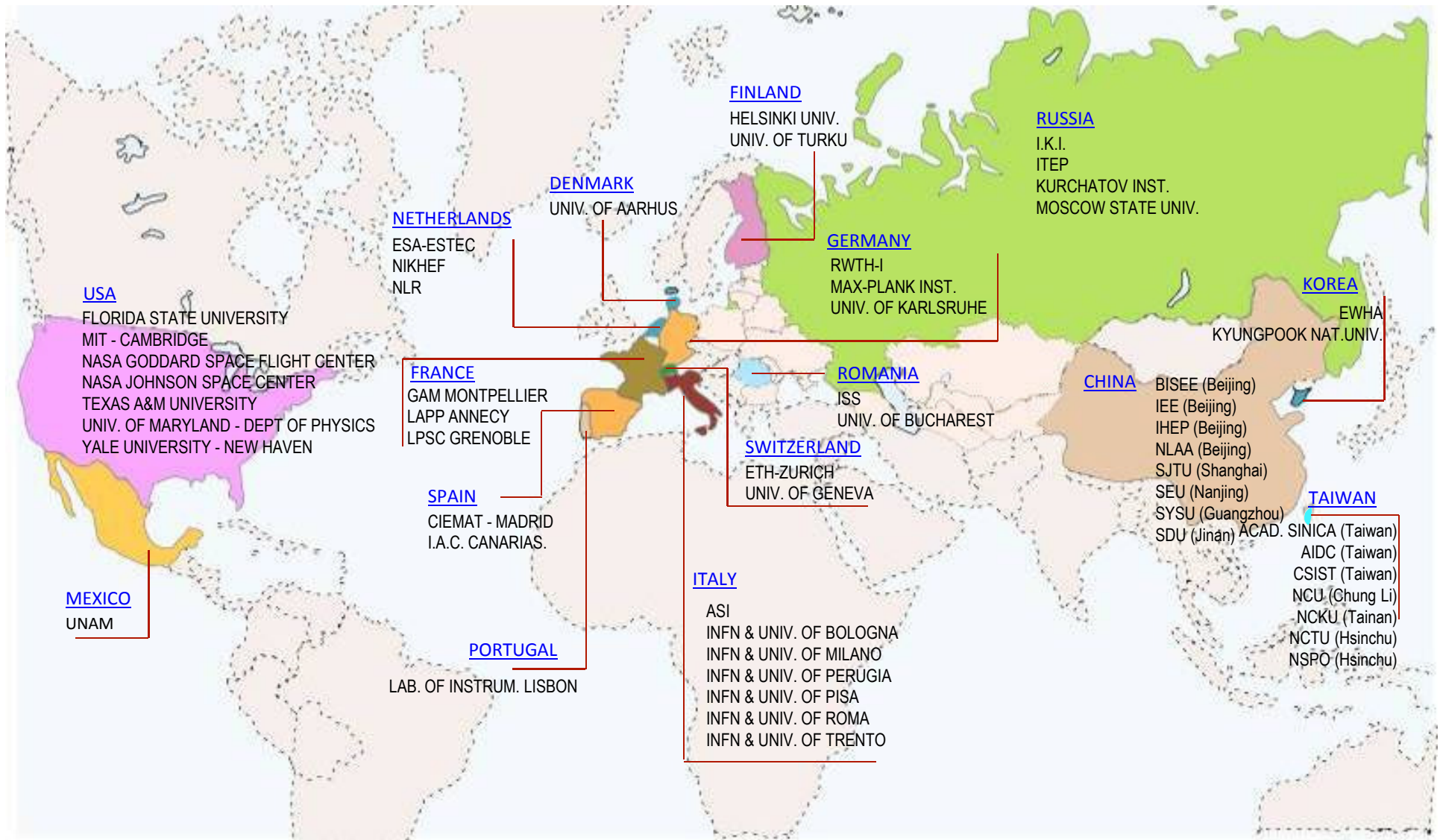
# Therefore in Europe:

- European space programmes are the result of intense international cooperation with many players and several national objectives, interests and resources;
- Space is still perceived by some countries as an element of power and prestige;
- European countries are engaged in several bi-lateral cooperations with NASA, Roscosmos etc. in addition to their participation into ESA programmes and now at EU level;
- Creating an optional programme at ESA is therefore a very challenging undertaking but also a very rewarding one!





# AMS is an International Collaboration



16 countries - 3 continents – 56 institutions – 600 scientists –  
16 years to develop it and get it launched



Together for the advancement of space safety



INTERNATIONAL ASSOCIATION  
FOR THE ADVANCEMENT OF  
SPACE SAFETY

[www.iaass.org](http://www.iaass.org)

Studies in Space Policy

R. S. Jakhu  
T. Sgobba  
P. S. Dempsey  
Editors

# The Need for an Integrated Regulatory Regime for Aviation and Space

ICAO for Space?

SpringerWien New York

ESPI  
European Space Policy Institute

# 6<sup>th</sup> IAASS Conference

International Association for the Advancement of Space Safety



# SAFETY IS NOT AN OPTION



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ICAO for Space? the possible extension to space of the international regulatory framework model adopted for aviation more than 60 years ago with the establishment of the International Civil Aviation Organization (ICAO).

# Autonomy for cooperation

Autonomy for cooperation became a motto, because the experience shows clearly that, in a global endeavor, autonomy is nearly mandatory to develop a good cooperation.

Increasing the autonomy of a participating country in a cooperative space program allows increasing the robustness of the partnership. In 2008 the concept of Autonomy for enhanced cooperation has been brought on stage, referring to the need at least for Europe to develop and master key technologies for the future operations of the International Space Station, and beyond for the exploration of the Solar System.

An aerial photograph of a rocket launch. The rocket is ascending vertically, leaving a thick, bright yellow and white plume of smoke and fire behind it. The background shows a vast landscape with a grid of roads and fields, partially obscured by a layer of white clouds. The sky is a clear, pale blue.

## What is cooperation about?

Bringing together expertise, common objectives, different technological assets and capabilities, avoiding duplications, maximizing results and the economic burden on each country participating, cross-cultural interactions providing a boost, for a proper management of an international endeavor at the frontier of new discoveries

An aerial view of Earth from space, showing a dense layer of white clouds over a blue ocean. A bright yellow and orange rocket launch trail extends vertically from the bottom center towards the top of the frame. The text is overlaid on the left side of the image.

## Why cooperation is so important in space?

On the basis of our experience, international cooperation works well and, in a way, it's mandatory in space

We are really entering in a new era for astronautics

For access to LEO it's now time for the commercial market to take it over

Gov. space agencies have to focus on new technologies, at the frontier of innovation, with new methods and approaches, with the goal of exploring the Solar System

# Why cooperation is so important in space?

Human exploration of the Solar System is a humankind endeavor, to be decided and managed, on a global scale

Science and discovery are not belonging to anyone in particular, but it is the heritage of humankind

Examples presented show a mixture of the top-down and bottom-up approaches (sometimes in the same program). This is also in the essence of “Autonomy for enhanced cooperation”, allowing in fact flexibility, robustness, inter-operability, national satisfaction and global success.





An aerial photograph of a rocket launch. The rocket is ascending vertically, leaving a thick, bright yellow and orange plume of smoke and fire behind it. The ground below is covered in a dense forest of green trees, and the sky is a clear, pale blue. The perspective is from a high altitude, looking down at the launch site.

## **How** different experiences can shape the future of space activities?

Experiences in cooperative programs will allow to prepare the future in the right way.

Other models exist and could be taken into account, or models which have been repeated or slightly modified could be considered. Success is depending from an high degree of interactions, and readiness to understand each other requirements and constraints in a partnership.

**We, the space community, now know how to do that**

A collage of space exploration images. The background features a large, reddish-orange planet (Mars) on the right side. Overlaid on this are several smaller images: an astronaut in a white suit holding a tool, a rover on a rocky surface, an astronaut in a white suit with a backpack, and a large blue and white planet (Earth) in the foreground. The text is overlaid in white, bold, sans-serif font.

Ready to accomplish the next  
step through  
global cooperation

Thanks a lot for your attention