

# SATELLITE AND SPACE COMMUNICATIONS

<http://www.comsoc.org/socstr/org/operation/techcom/satellite.html>



## IEEE COMMUNICATIONS SOCIETY



SSC Newsletter

Vol. 15, No. 2, November 2005

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The Satellite and Space Communications (SSC) Committee is a volunteer group actively involved in advancing satellite and space communication technologies within the IEEE. This committee is approved by the IEEE Communications Society and is governed by the constitution and bylaws of the IEEE as well as the other twenty Technical Committees in the Society.

## SATELLITE & SPACE

### - JOIN US -

All conference attendees are welcome to join us in the SSC Committee meeting.

**Location:** America's Center  
(Convention Center),  
Room 221, St. Louis,  
MO, USA

**Date:** Wednesday, Nov. 30<sup>th</sup>

**Time:** Start time: 12.30 p.m.  
End time: 02.00 p.m.

### Future SSC Meetings

June 2006 Istanbul, Turkey

Nov 2006 San Francisco, CA, USA

### Globecom 2005 SSC Committee Activities

#### TUTORIALS & WORKSHOP (Nov. 28<sup>th</sup> and Dec. 2<sup>nd</sup>)

**TU-07 - IEEE Standards and Cellular-Based Broadband Wireless IP**

Duration: Mon, 28 Nov, 2:00pm-5:00pm

Presenter: Abbas Jamalipour, University of Sydney, Australia

**WO4: Advances in Satellite Communications: New Services and Systems**

Duration: Fri 2 Dec, 9:00am -12:00pm

Session Organizers: Sastri Kota, Harris Corporation, USA,  
Giovanni Giambene, University of Siena, Italy

#### TECHNICAL SYMPOSIA (Nov. 29<sup>th</sup> – Dec. 1<sup>st</sup>)

**CT04 - Performance Analysis**, Tue Nov 29, 2:00pm – 4:00pm

**SP03 - Signal Processing Poster**, Tue 29 Nov, 2:00pm – 5:00pm

**WC27 - Satellite Networks** - Wed 30 November, 2:00pm – 4:00pm

**GC10 - Wireless Systems and Networks**, Wed 30 Nov, 2:00pm – 4:00pm

**WC41 - Queuing and Scheduling**, Thu 1 Dec, 2:00pm – 4:00pm

**NI08: Congestion control**, Thu Dec 1, 4:00pm – 6:00pm

**WC15 - OFDM III**, Tue 29 Nov, 4:0 pm – 6:00pm

#### TELECOM BUSINESS FORUM

**Networks Communications: Wireless Issues**: Tue 29 Nov, 2:00pm – 4:00pm

Session Organizer: Dan Simone, Trapeze Networks, USA

**Wireless Communications**: Tue 29 Nov, 4:00pm – 6:00pm

Session Organizer: Mikko Ju Salminen, Nokia, USA

#### DESIGN & DEVELOPERS FORUM

**Ubiquitous Networks Design and Applications-I and II**: Wed 30 Nov,  
10:15am - 12:15pm and 2:00pm – 6:00pm

Session Organizer: Ryoichi Komiya, Multimedia University, Malaysia

Session Chair: Junichi Kishigami, NTT



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## HOW TO JOIN SSC COMMITTEE AND MAILING LIST

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**If you like to join SSC Technical Committee:** Please send your name and e-mail address to the SSC Secretary, optionally include your mail address, telephone and fax numbers.

**If you like to join SSC Mailing List:** Instructions on how to subscribe/unsubscribe are available at <http://cassius.ee.usyd.edu.au/mailman/listinfo/ssc>.

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### MESSAGE FROM THE CHAIR

*Abbas Jamalipour*

The Satellite and Space Communications (SSC) Technical Committee (TC) members will meet again on Wednesday 30 November 2005, at 12:30 pm in St. Louis during IEEE Globecom2005. The SSC TC meets two times a year during ICC and GLOBECOM conferences, and the meeting is a very good opportunity for all people from industry and academia with any interest in research and development in satellite and space communications. All conference attendees are welcome to attend and those who are attending the SSC TC meeting for the first time will automatically become a member of TC. Please join us to discuss mutual topics of interest in this important field in communications technology. The meeting agenda and other information about SSC TC activities and operation can be found at the TC web page:  
<http://www.comsoc.org/socstr/org/operation/techcom/satellite.html>.

SSC TC is an international volunteer organization governed by the IEEE Communications Society. SSC has been providing a forum for technical

advancement of space communications since our founding in 1962. Please help us to continue our contributions to this exciting field by active participation in our committee. There are numerous ways to be an active TC member. Organizing special issues in journals and magazines, conferences, symposiums and technical sessions, and also reviewing papers related to satellite communications are among those activities. You are welcome to contact me or other TC officers to express your interest.

The satellite research activities are strategic and important and therefore there are currently many governmental and industry supported projects on satellite communications in many parts of the world. For a sample of these activities in academia and industry, you may find the two special issues of the IEEE Wireless Communications Magazine published in October 2005 very interesting. The two issues entitled "Key Technologies and Applications of Present and Future Satellite Communications" and "The Synergy of Space and Terrestrial

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Communications in Next-generation Hybrid Wireless Systems” cover a wide range of activities around the world in this important field of research. The response to the call-for-papers for these two issues was so overwhelming that there will be another half-issue to be published in December 2005.

SSC is also active in organizing sessions and workshops for major IEEE ComSoc conferences such as ICC, Globecom, and WCNC. In Globecom2005, there are many papers related to the satellite communications in the Wireless Communications Symposium, chaired by Abbas Jamalipour. There will be also a workshop on Friday, 2 December, 9:00AM-12:00PM (WO-4 - Advances in Satellite Communications: New Services and Systems) that has been organized by the TC members. For ICC2006, SSC TC has sponsored the Symposium on Next Generation Mobile Networks. SSC TC will have a single symposium on Satellite and Space Communications in IEEE Globecom2006, to be held in San Francisco and you are strongly invited to submit papers to this symposium. SSC TC will also have sponsored symposiums in ICC2007 and Globecom2007. Finally SSC TC has been very active in working with the IEEE Wireless Communications and Networking Conference, WCNC. The next WCNC will be held in Las Vegas, on April 3-7, 2006. Your support and help as TC members is the main factor in the success of these activities and the SSC goals.

In promoting satellite research and publication, the TC has awarded the 2005 Distinguished Contribution to Satellite Communications to two

researchers based on nominations and a comprehensive selection process. Awards and plaques will be presented during Globecom2005. Nominations and applications for the SSC award are accepted based on a regular annual basis, by July 15th each year. You are welcome to nominate your colleagues or apply for the next award.

SSC TC has also endorsed several international conferences and workshops in the past few months in Europe and Asia for 2006 were the satellite research is very active. The list of those workshops that have been supported by the Communications Society is available on the Society web page. The SSC TC web page and its mailing list continue to be an active and reliable medium for exchanging information and call for papers related to the satellite communications. You are kindly invited to use this medium for distributing your information related to the satellite communications research and development that might be useful to other TC members.

As you can see, there are numerous ways for you to participate in SSC to help advance our field and the professional careers of our members and yourself. I have found this to be a rewarding endeavor and invite you to join us. As stated before, by attending one of SSC TC meetings, you will automatically become a member and can participate in a warm research community toward future of satellite communications.

*Prof. Abbas Jamalipour, Chair  
Satellite and Space Communications  
Technical Committee*

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## SCANNING THE WORLD

*Mario Marchese*

In my previous “Scanning the World”, I concluded the paper by attracting the attention of the readers on a specific special issue of *Computers and Electrical Engineering Journal* dedicated to “Recent Advances in Wireless Networks and Systems”, whose Guest Editors are Prof. Mohammed Obaidat and myself. The call for papers solicited recent research results dealing with technological solutions, protocols, applications, performance analysis of Wireless Networks, including WLANs, WMANs, radio networks, 3G and beyond systems, military tactical and satellite networks. After receiving the submissions (70 globally), it seemed strange to me that very few papers were related to satellites nevertheless my efforts to highlight the importance of satellite communication and networking in the call for papers. This result is in apparent contradiction with the large number of papers received by Abbas and me for the, Special Issue of IEEE Wireless Communications on “Present and Future Satellite

Communications”, published in October 2005 (vol. 12, no. 5). For it we received approximately the same number of papers (70) but all of them concerned satellites. I think it is a precise message of satellite people: they prefer proposing and discussing their ideas and results within the satellite community. On one hand it is a positive aspect, satellite topics and related solutions have got a specific scientific dignity, they deserve specific journals and conferences. On the other hand, the risk is isolation. We need to have possibly Symposia but at least tracks and sessions dedicated to satellite communications within man international conferences (in particular Globecom and ICC). To reach this aim is strongly necessary to propose papers and new ideas to a wide community as, for example, wireless communication. The quality of the satellite papers produced is very high. It is certified by the international publications. One specific example is just the special issue of *Computers and Electrical Engineering Journal* on

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"Recent Advances in Wireless Networks and Systems". The selection process is now concluded. Among the accepted papers, 5% concerns satellite communications and networking. Due to the limited number of submitted papers about satellites, 5% is not negligible. We need to disseminate our knowledge throughout the overall scientific community not limiting our scope. Satellites may be topical to fill the digital divide among countries. The nature itself of them joined to new technical solutions allows offering an immediate coverage at high speed at service cost, reliability and quality comparable to terrestrial solutions. Satellite communications constitute a strategic sector, with significant economic and social impact. They are very important for service provision in remote and low density population areas, aeronautical services, interplanetary communications, navigation and localization, disaster prediction and relief, safety for critical users, search and rescue, Internet connection and data transmission for maritime environment, aviation and trains, and crisis management. It is important to exploit all the possibilities. Examples to do it are: to disseminate our scientific works not remaining closed within our restricted community; to propose research projects, new tools and applications together with the industry

also working towards the convergence and integration of with terrestrial networks, considering all interworking and interoperability aspects. Actually it is the aim of the ISI initiative (Integral Satcom Initiative), chaired by Prof. Giovanni E. Corazza, University of Bologna, Italy. It is an industry-led action forum designed to bring together all aspects related to satellite communications. ISI addresses broadcasting, broadband, and mobile satellite communications, as well as their convergence, in integration within the global telecommunication network infrastructure. ISI is intended to be part of the group of Technology Platforms included in the seventh Framework Programme (FP7) of the European Commission. Due to the importance of this action, the Perspective Paper of this Newsletter is dedicated to it. The contribution is authored by ISI Chairman, Prof. G. E. Corazza. I personally invite the Members of our Technical Committee and all the scientific community to read it with extreme attention and interest for the benefit of satellite communications.

*Prof. Mario Marchese, Vice-Chair  
Satellite and Space Communications  
Technical Committee*

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## FORTHCOMING GLOBECOM AND ICC CONFERENCES

### ICC 2006

*June 11 – 15, 2006, Istanbul, Turkey*

The technical program will feature 9 technical symposia disseminating the latest research in communications and networking, and 12 executive panels and applications sessions, where industry leaders will address the hottest challenges for the future. ICC 2006 will thus feature a very rich technical program equally attracting academics and engineers from industry, network operators, and service providers.

### ICSSC 2006

*June 11 – 15, 2006, San Diego, CA, USA*

It is a premier technical conference covering all aspects of satellite communication. It is a forum for satellite systems developers, component and equipment designers, satellite operators and service providers. Presentations and papers cover advances in communications techniques, technologies and systems architectures, as well

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## COSPONSORING / RELATED CONFERENCES AND WORKSHOPS

as their impacts on applications and services (including fixed, broadcast, mobile and personal communications).

### MILCOM 2006

*October 23-25, 2006, Washington DC, USA*

MILCOM 2006 is soliciting both unclassified and classified papers relevant to communication and information system capabilities that address the 21st century and beyond challenges of National Defense. Industry, academic and government organizations from the U.S. and other DoD-approved countries are encouraged to participate.

### Globecom 2006

*November 27 – December 1, 2006, San Francisco, CA, USA*

The theme of IEEE GLOBECOM 2006 "Communications: The Global Bridge" characterizes the continuing pervasiveness of telecommunications in all aspects of global society, industry, and government.

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## CONFERENCE CALENDAR

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CONFERENCE	LOCATION	INFORMATION
<b>WCNC 2006</b> IEEE Wireless Commun. and Networking Conf.	April 3 – 6, 2006 Las Vegas, NV, USA	<a href="http://www.ieee-wcnc.org/2006/">http://www.ieee-wcnc.org/2006/</a>
<b>VTC 2006 Spring</b> 63 <sup>rd</sup> IEEE Vehicular Technology Conf.	May 7 – 10, 2006 Melbourne, Australia	<a href="http://www.vtc2006spring.org/">http://www.vtc2006spring.org/</a>
<b>ASMS 2006</b> 3 <sup>rd</sup> Advanced Satellite Mobile Systems Conf.	May 29 – 31, 2006 Herrsching am Ammersee (Munich area), Germany	<a href="http://asms1.wss.bcentral.com/asms2006/default.htm">http://asms1.wss.bcentral.com/asms2006/default.htm</a>
<b>ICSSC 2006</b> 24 <sup>th</sup> AIAA Int. Comms Satellite Systems Conf.	June 11 – 15, 2006, San Diego, CA, USA	<a href="http://www.aiaa-icssc.org">www.aiaa-icssc.org</a>
<b>ICC 2006</b> Int. Conf. on Communications	June 11 – 15, 2006, Istanbul, Turkey	<a href="http://www.icc06.org/">http://www.icc06.org/</a>
<b>SPECTS 2006</b> Int. Symp. on Performance Evaluation of Computer & Telecommunication Systems	July 30 – August 3, 2006 Calgary, Canada	<a href="http://www.scs.org/">http://www.scs.org/</a>
<b>PIRMC 2006</b> 16th IEEE Int. Symp. on Personal, Indoor & Mobile Radio Communications	September 11 – 14, 2006 Helsinki, Finland	<a href="http://www.pimrc2006.org/">http://www.pimrc2006.org/</a>
<b>IWSSC 2006</b> 2 <sup>nd</sup> Int. Workshop on Satellite and Space Communications	September 14 – 15, 2006 Leganes-Madrid, Spain	<a href="http://iwssc2006.tsc.uc3m.es">http://iwssc2006.tsc.uc3m.es</a>
<b>VTC 2006 Fall</b> 64 <sup>th</sup> IEEE Vehicular Technology Conf.	September 25 – 28, 2006 Montreal, Canada	<a href="http://www.vtc2006fall.org/">http://www.vtc2006fall.org/</a>
<b>MILCOM 2006</b> IEEE/AFCEA Military Communications Conf.	October 23-25, 2006, Washington DC, USA	<a href="http://www.milcom.org/2006/">http://www.milcom.org/2006/</a>
<b>GLOBECOM 2006</b> IEEE Global Communications Conf.	November 27 – December 1, 2006, San Francisco, CA, USA	<a href="http://www.ieee-globecom.org/2006/">http://www.ieee-globecom.org/2006/</a>

**To all SSC members:** If your postal address, telephone or fax numbers have changed, please update them with the committee secretary. You can review our current records on our web page at <http://www.comsoc.org/~ssc/>.

## ISI: The Integral Satcom Initiative

Giovanni E. Corazza

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### Introduction

As the worldwide telecommunications network is evolving fast, and historically separate sectors are converging into a single competition arena, there is an apparent need to coordinate efforts in the field of satellite communications, in order to maximize its chances for business consolidation and growth. This is precisely the purpose of the Integral Satcom Initiative (ISI), a Technology Platform which is being set up in Europe in view of the upcoming 7<sup>th</sup> Framework Programme (FP7) of the European Union (EU), and of the implementation of the European Space Policy, in collaboration with the European Space Agency (ESA). This perspective article highlights the ISI founding principles and its present status.

### The Concept of Technology Platforms in FP7

The European Commission (EC) is working towards the implementation of FP7, which will run from 2007 to 2013, and is expected to have extremely significant impact and structuring effects for Europe, with focus over sectors of recognized strategic relevance [1]. Two very important sectors in FP7 will be Information and Communications Technologies (ICT) in the Information Society [2], and Space & Security, which is in relation to the implementation of the European Space Policy [3], in cooperation with ESA [4].

Within FP7, a new element has been introduced, known as *Technology Platform*. Technology Platforms (TPs) are industry-led initiatives intended to define research and development (R&D) priorities and timeframes. They focus on areas of significant economic impact and high societal relevance, where there is high public interest and scope for genuine value added through European and International response. The initial work of a TP focuses on the preparation of a Strategic Vision document, a Strategic Research Agenda and the mobilization of the necessary critical mass of research and innovation effort. More information regarding TPs can be found in [5].

Arguably, a pioneering example of platform can be considered to be the Task Force on Advanced Satellite Mobile Systems (ASMS-TF), which was launched in 2001 under the auspices of EC and ESA [6]. In fact, the ASMS-TF represents the interests of a broadly-based

industrial community, and works actively on several fronts including R&D, standardization, regulatory matters, and commercial operations. In June 2005, the ASMS-TF decided to launch an initiative focused on satellite communications in broader terms, and this is in fact the *Integral Satcom Initiative*.

### ISI: Scope, Rationale, and Governance

ISI is an industry-led action forum designed to bring together all aspects related to satellite communication (*satcom*). In fact, ISI addresses broadcasting, broadband, and mobile satellite communications, as well as their convergence and integration into the global telecommunication network infrastructure. ISI supports all forms of space communication and space exploitation.

ISI is designed as an open platform, embracing all relevant and interested private and public stakeholders. ISI intends to collaborate and cooperate with the European Commission, the European Space Agency, the EU and ESA Member States and Associated States, the National Space Agencies, International Organizations, User fora, and other TPs. ISI fosters international cooperation under a global perspective, and already enumerates participants from outside of Europe. See Fig. 1 for a pictorial view of the scope of ISI.

ISI is determined to contribute significantly to several EU and ESA policies, in order to promote European industrial competitiveness, growth and employment in a sustainable way, in synergy with National priorities. Representative EU sectors of interest include ICT, Space, Security, Transport, Development, and Environment. Specific policy initiatives of interest include i2010 [7], the European Space Policy, and in general all those initiatives which can benefit from the existence of an efficient satellite communications infrastructure, or which are aimed at the development of innovative satellite services and technologies.

The rationale of ISI is based on the fact that satellite communications constitute a strategic sector for Europe, with significant economic impact and high societal relevance. Satcoms are instrumental for European-wide and International broadcasting, mobile communications, broadband access, bridging the digital divide, safety, crisis management, disaster relief, and dual use applications.

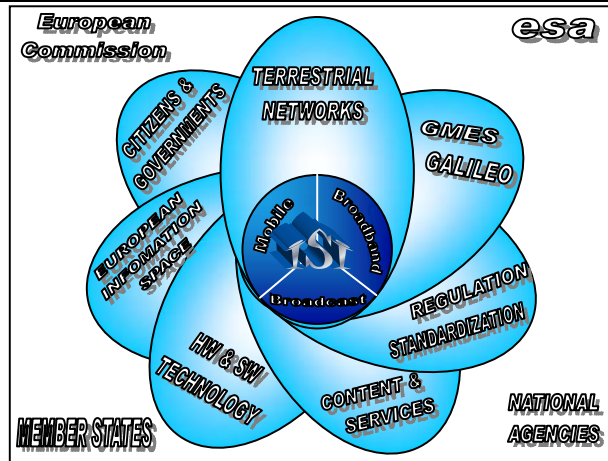


Fig. 1 – A pictorial view of ISI scope and inter-relationships

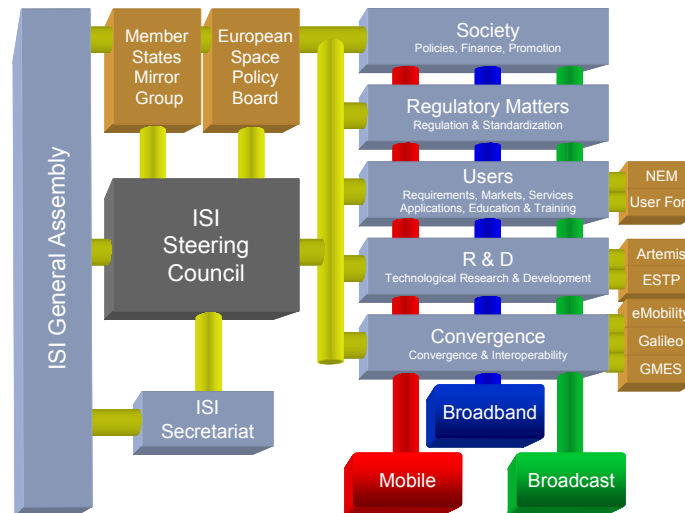


Fig. 2 – The ISI Governance Structure

In fact, satellites provide both direct access to, and the backbone of European and Worldwide digital information broadcast networks, as well as interactive and subscription TV services, mobile services to ships, aircrafts and land-based users, and data distribution within business networks. Satellites are also a key element in the Internet backbone, and enable both broad and narrowband Internet access services from remote and rural locations. Satellite services provide an essential component of disaster relief activities worldwide, offering reliability, instant and long-term availability, over very wide areas. In addition to civil applications, the unique coverage advantages of satellite systems position them as key

players for risk and crisis management for institutional, government and defense applications.

ISI works towards the convergence and integration of satellite and terrestrial networks, both fixed and mobile, considering all interworking and inter-operability aspects. ISI supports the development of applications and services according to a user-centric approach, to enable all citizens to become full members of the knowledge-based society. ISI addresses the integration of satellite communications with navigation, Earth observation, and Air Traffic Management systems. Specific attention is devoted to Galileo and GMES. Data relay systems and the use of Unmanned Aerial Vehicles are in the scope of ISI, as well.

The governance structure that is foreseen for ISI is represented pictorially in Fig. 2; the main decisions are taken by the Steering Council, which reports to the General Assembly of all ISI participants. Several Advisory Boards are foreseen as open tables for discussion. Several working groups are envisaged, with interfaces to important programmes and other TPs and initiatives.

### ISI: Success Factors

ISI intends to be instrumental in achieving and maintaining European leadership and competitiveness in all of the above-mentioned fields, fostering the entire industrial sector, and maximizing the value of related research and technology development. In practice, there are several concrete targets that must be achieved for satcoms:

- Identify user requirements and market segments
- Reduce costs (terminals, networks, tariffs, licenses, etcetera)
- Develop open standards
- Secure spectrum allocation and sharing rules
- Harmonize the regulatory framework
- Coordinate efforts while preserving competition
- Contribute to the user centric services trends
- Accompany the convergence move
- Integrate satcoms with
  - Terrestrial networks
  - Galileo
  - GMES
  - Air Traffic Management systems
  - Security programmes
- Reduce time to market for competitiveness

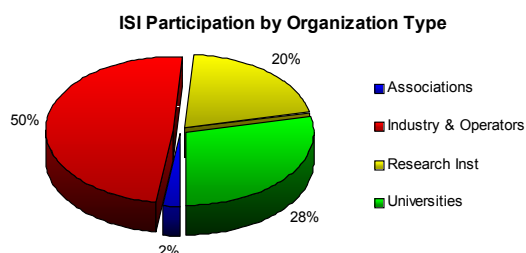
### ISI: Regulation and Standardization

One of the main priorities of ISI is to contribute to the harmonization of the European and International regulatory framework for satellite communications, helping in the removal of barriers. ISI works for the allocation of sufficient spectrum for all satellite communication applications and services. ISI favors the consideration of a regulatory framework for complementary ground components (CGC).

ISI promotes open standards and international standardization approaches. Indeed, ISI fosters wide adoption of common standards to enlarge markets, reduce costs and tariffs, facilitate interoperability and roaming, and ensure fair competition for the benefit of citizens, user communities and governments.

### ISI: Constituency and Documents

ISI embodies the critical mass required to pursue the above objectives considering short term priorities, medium-term evolutions, and long-term strategic directions. ISI Participants are increasing rapidly. Presently, there are more than 100 institutions from 16 different Countries: Austria, Belgium, France, Germany, Greece, Hungary, Israel, Italy, Luxemburg, Norway, Slovenia, South Korea, Spain, Switzerland, United Kingdom, USA. The full list of entities can be found in [8]. See Fig. 3 for the split among the ISI participants in terms of organization type.



**Fig. 3 – ISI Constituency Aggregation**

The ISI participating entities have worked towards the production of Strategic Vision Document [9] which includes a Vision Statement [10], which has been signed by the highest company or institution representatives. Work is well under way for the preparation of the Strategic Research Agenda. This document will define the priorities for R&D in the satcoms sector for the medium- and long-term.

In order to become part of ISI, and take active part in the definition and implementation of its ambitious work-programme, it is necessary to write an e-mail message to [isi-info@deis.unibo.it](mailto:isi-info@deis.unibo.it) stating your intention to contribute effectively and requesting an application package.

### References

- [1] <http://www.cordis.lu/fp7>
- [2] [http://europa.eu.int/information\\_society](http://europa.eu.int/information_society)
- [3] <http://europa.eu.int/comm/space>
- [4] <http://www.esa.int>
- [5] <http://www.cordis.lu/technology-platforms>
- [6] <http://www.asms-tf.org>
- [7] [http://europa.eu.int/information\\_society/eeurope/i2010](http://europa.eu.int/information_society/eeurope/i2010)
- [8] <http://www.isi-initiative.eu.org>
- [9] ISI Strategic Vision Document, November 2005
- [10] ISI Vision Statement, October 2005