



European Commission
Information Society and Media



SEVENTH FRAMEWORK
PROGRAMME

THE INTEGRAL SATCOM INITIATIVE

EUROPEAN TECHNOLOGY PLATFORM - WWW.ISI-INITIATIVE.ORG

**European Technology Platform «Integral SatCom Initiative»:
prospects for R&D cooperation on Satellite Communication systems
with Russian industry**

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Agenda

ISI ETP overview

Strategic Research & Innovation Agenda

Prospects for R&D cooperation with Russian industry



ISI overview



European SatCom industry

- ❑ **65% of the European satellite manufacturing industry turnover (up and down stream revenues) and employment (30000 Highly skilled jobs),**
- ❑ **Essential element of any global networks;**
 - **Network electronic media (> 77 Million Households in Europe), Digital inclusion (Broadband access), Security and Defence**
- ❑ **Driving force for technologies development, applicable to all industrial sectors**
- ❑ **Satellite industry is a worldwide high technology market**



ISI overview

Technology platform for Satellite Communications

- ❑ **200+ members organizations representing all the European SatCom industry stakeholders**
 - manufacturing industry, network operations and service provision, SMEs, research centers and academia, European and National Institutions.
- ❑ **To create critical innovation mass to identify and address SatCom research challenges**
 - To develop **innovative technologies, products and services** up to in-orbit validation and large scale pre operational experimentations
 - To undertake **Standardization, Regulatory** and **Marketing** activities
- ❑ **To define the required European framework which will**
 - pave the way for development of future SatCom solutions adapted to EU needs
 - reinforce the European SatCom industry competitiveness



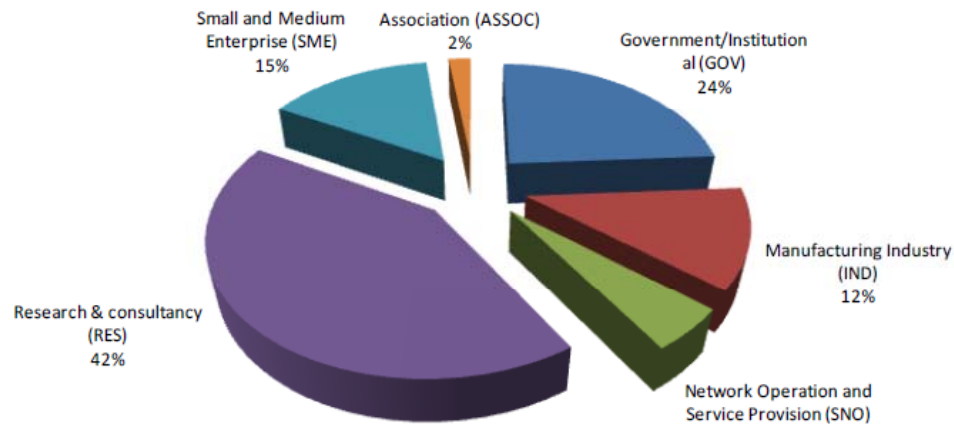
- * **Strategic Research and Innovation Agenda for SatCom**
- * **Position papers with respect to policy related topics**



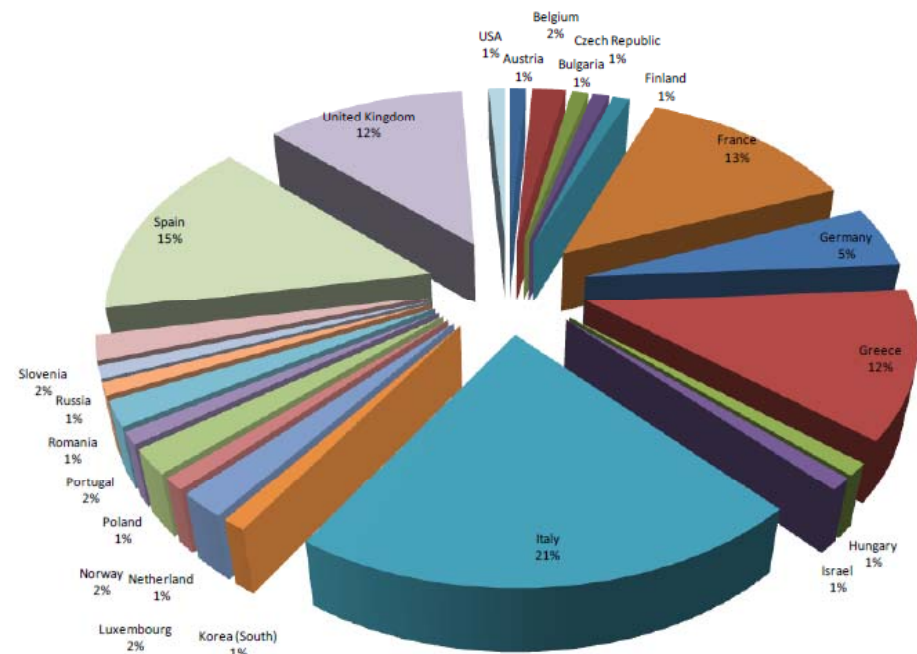
ISI membership

- Mainly European SatCom industry stakeholders

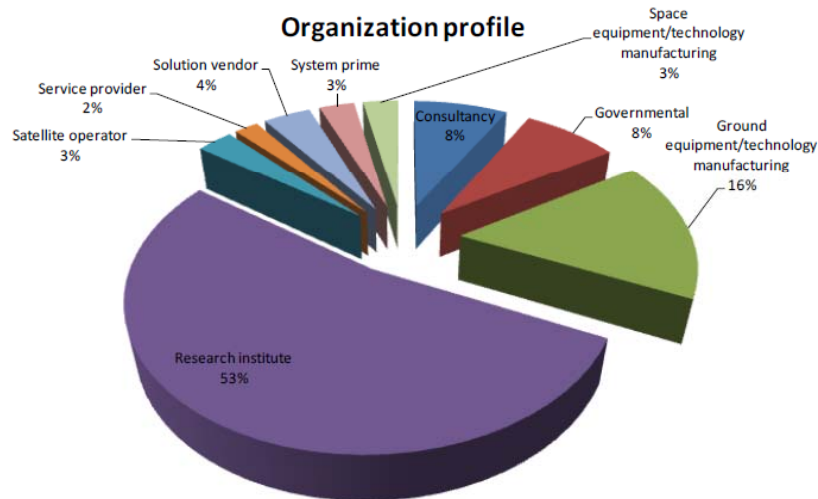
Organization sector



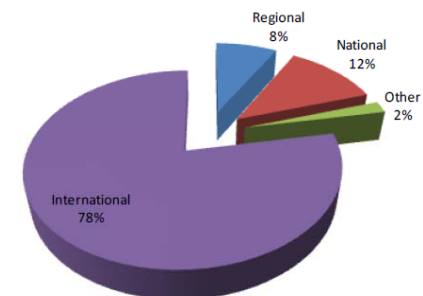
ISI Members distribution per Country



Organization profile

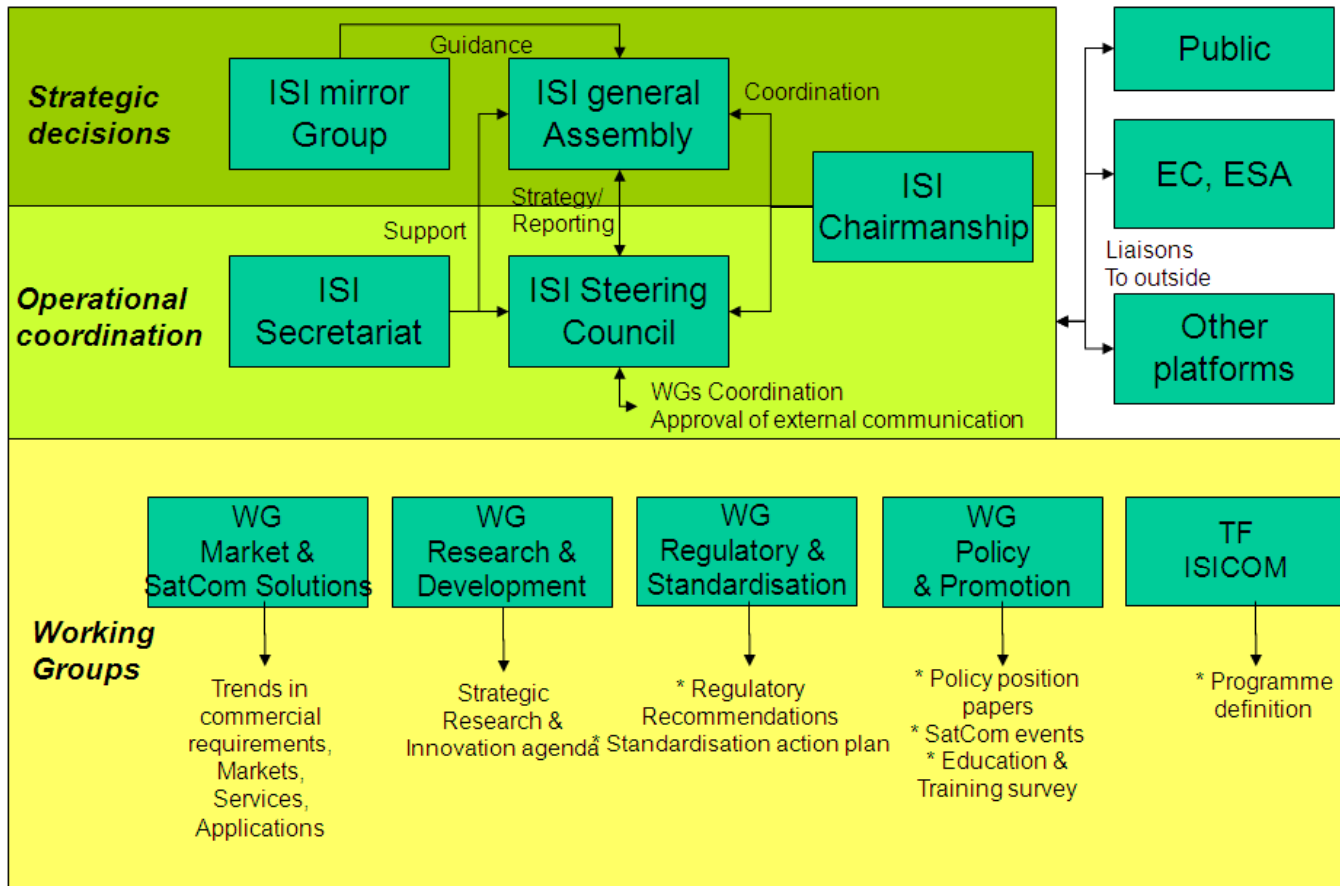


Institution/Company Market Type





ISI Governance and Structure



ISI Chairman

Nicolas Chuberre

Thales Alenia Space

ISI Vice Chairman

Jean-Francois Charrier EADS

Astrium

ISI Steering Council

Manufacturing Industry

- Thales Alenia Space
- EADS Astrium
- Gilat Satellite Networks

Network Operations and Service Provision

- Atos Origin
- SES Global
- Telespazio

SME

- ROSE Vision
- Space Hellas

Research Institutions and Academia

- DLR
- University of Bologna
- University of Surrey



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ISI research capabilities and priorities

European policy	SatCom added value	SatCom emerging solutions
Digital Agenda	Overcome the Digital/Speed divide when targeting <u>ubiquitous broadband coverage objectives</u> with internet speeds gradually increasing up to 30 Mbps	<u>Powerful multi beam satellite networks</u>, for cost optimised broadband access in low populated density areas
Security and Defence Policy	<u>Improve Europe's capacity to prevent and respond to crisis or disaster situations wherever they may occur</u>	<u>Flexible satellite networks</u> for global, secured and resilient communications (ISICOM initiative)
Future Internet	<u>Resilience, QoE booster, Cost effective service delivery over wide coverage</u>	Integration with terrestrial networks



The Strategic Research & Innovation Agenda



Strategic research and Innovation Agenda

□ ISI SRIA Objective:

- Definition of the European SatCom industry research and innovation priorities

□ SRIA defined through a stepped approach:

- **Identification** of SatCom contributions to the Digital Agenda for Europe
- **Mapping** of SatCom Systems on Digital Agenda objectives
- **Analysis** of technical and non-technical Enablers
- **Definition** of Research and Innovation topics
- **Prioritization** of Research and Innovation topics



SatCom and Policy objectives - 1

□ Fast and ultra fast Internet access

- coverage of at least **10Mhouseholds**, fundamental tool **to achieve the goal of broadband access for everyone** in low density populated areas not reachable by other solutions

□ Transport and mobility:

- **Monitoring, event alert , guidance** to public and private transport resources, travellers decision making anywhere beyond terrestrial reach

□ Energy

- Support to optimized **Smart Grid monitoring, black-out management**, high availability **back-up for communications** and **control networks** in critical scenarios.

□ Security

- key components of **telecom infrastructure for security , emergency missions, rescue teams and survivors** thanks to inherent **dependability**, and **ubiquitous access capabilities**



SatCom and Policy objectives - 2

□ Environmental monitoring:

- Satellite and UAV for synchronous and **real time collection and relay of sensor data** over **small to extremely wide areas**, up to continents wide

□ Digital literacy, skills and inclusion (content)

- support to **cost effective solutions for delivery of high resolution content** in areas **beyond reach of other access systems**.

□ Healthcare

- **healthcare in rural and low density populated areas by facilitating the flow and sharing** of medical expertise and information among medical centres and from homes to hospitals and medical teams



SatComs and Policy objectives

Objectives/Satellite Syst	Broadcast systems	Backbone systems	Broadband fixed/mobile	Narrowband mobile sat syst.	Governmental fixed /mobile
Fast and ultra fast internet access					
Transport and mobility					
Energy (Smart Energy grid)					
Security					
Environmental monitoring					
Digital literacy, skills and inclusion (content)					
Healthcare					



SatCom challenges (1/2)

□ Performance:

- maximum **service rate capability**, service availability , and QoS in line with terrestrial networks through advanced space segments.

□ Cost reduction:

- improved **space segment throughput**, **network management** process, optimisation of **space and ground equipment** production, installation, and maintenance.

□ Network integration (satellite with terrestrial systems):

- integration into **Next Generation Networks** at core (e.g. IMS) and access network.
- support of **unified service delivery** to end-user through mobility among access methods, and satellite and terrestrial links.



SatCom challenges (2/2)

□ Flexibility

- to **enhance** operators economics and **mitigate** business risks over satellite lifetime flexibility and reconfigurability of
 - satellite payload to adapt to evolving market conditions and support different of the satellite mission.
 - satellite coverage, frequency plan, transmit power, capacity allocation, connectivity scenarios.

□ Integration with navigation and observation systems

- to support the **delivery of new services** and applications able to enlarge the SatCom market.

□ Resilience and Security

- Increase service **radio link availability** and **system resilience** to major disruption events.

Non-technical enablers

- ❑ Regulatory framework
- ❑ Standardization framework
- ❑ In orbit validation for innovative space segment technologies/payloads
- ❑ Business model, best practice, etc

Technical Enablers

- ❑ Increased service performance
- ❑ Optimized operational cost
- ❑ Improved Quality of Experience
- ❑ Increased space segment capability
- ❑ Capacity distribution scenarios
- ❑ Connectivity scenarios
- ❑ Terminal profile and usage conditions
- ❑ Service coverage configuration
- ❑ Enrichment of service offer



SatCom research and innovation areas

5 Research and Innovation areas

- ❑ **Space segment**
- ❑ **Ground infrastructure**
- ❑ **Terminals**
- ❑ **Radio Interfaces**
- ❑ **Networking**
- ❑ **Services and applications**



Strategic research and innovation topics (1/2)

- ❑ **Space segment: High-Throughput, Flexibility and Reconfigurability**
 - Markets and Resources
 - Capacity and Throughput
 - Flexibility and Reconfiguration
 - Interference and Management
- ❑ **Ground infrastructure: Distributed Processing**
 - High capacity feeder links
 - Multigateway architectures for distributed processing of feeder links signals
 - Distributed radio resource management algorithms for fully meshed networks
 - Advanced Interference management and cancellation techniques
- ❑ **Radio Interfaces: Efficiency and Robustness**
 - Cognitive radio
 - Cooperative techniques
 - Multi beam/feed transmission techniques
 - Interference management techniques
 - Waveform design
 - Fading and channel impairments countermeasures
 - Channel modelling
 - Flexible radio interfaces for QoS



Strategic research and innovation topics (2/2)

□ **Networking: Integration and Convergence**

- Network management harmonisation between satellite and terrestrial networks
- Adaptive middleware to cope with new approaches e.g., dynamic spectrum management and cooperative techniques
- De-centralised radio resource management algorithms
- Flexible resource management among different radio interfaces
- Vertical handover techniques between terrestrial and satellite interfaces
- SatCom Role in Future Internet

□ **Terminals: User-Friendliness and Reconfigurability**

- Consumer and Professional Handheld
- Collective Mobile Broadband and Broadcast
- Fixed Broadband and Broadcast
- M2M and SCADA

□ **Services and applications: Ubiquity and Dependability**

- Ubiquitous Broadband Access
- Emergency Bidirectional Communications and Backhauling
- Ubiquitous Messaging Services (SMS over Satellite, M2M, SCADA, Smart Infrast.)
- Enhanced Broadcast Experience



ISI SRIA development: Next Steps

□ **Stepped approach**

- **Identification of SatCom contributions to the Digital Agenda [Completed]**
- **Mapping of SatCom Systems on Digital Agenda objectives [Completed]**
- **Analysis of Enablers and Enabling Technologies [Completed]**
- **Identification of Research and Innovation topics [Completed]**
- **Prioritization of Research and Innovation topics [Under approval]**

□ **SRIA is a living document contributions are always welcome on any topics, no need to be a SatCom expert:**

- **Integration and convergence**
- **Service and applications**
- **R&D aspects**
- **...**



Prospect for R&D cooperation with Russian industry



ISI future plans - 1

15th ISI General Assembly - April 10, 2012 in Brussels/Belgium

- ❑ 1. Steering Council and Working Groups activity reports
- ❑ 2. Interactive R&D workshop to prioritize the research innovation topics
 - Interactive session with the audience via a web tool
- ❑ **Expected attendance**
 - **ISI members**
 - => **Rusian delegates are invited to take part**

5th ISI SatCom day: - April 11, 2012 in Brussels/Belgium

- ❑ 1st Workshop on ISICOM (SatCom for security missions)
 - Crisis management, Security of citizens, Security of infrastructure and utilities, Surveillance and Border control, Transport Security, EU External actions and Humanitarian relief activities
- ❑ 2nd Workshop on Very high speed Broadband internet access via Satellite in Europe
 - About next generation satellite infrastructures to fulfil the Broadband for all objective
- ❑ **Expected attendance**
 - Policy makers from European parliament and european Commisison, Space agencies, SatCom industry, terrestrial ICT industry, ICT research community
 - => **Rusian delegates are invited to attend this workshop**



ISI future plans - 2

FUNEMS: Jul 4 - 6, 2012 in Berlin/Germany (<http://www.futurenetworksummit.eu>)

- ❑ **1. Support to the definition of Thematic Priorities**
- ❑ **2. Support to the conference organization**
 - **Special session on integrated satellite communications**
 - **Technical Program Committee**
 - **Financial support**
- ❑ ***Expected attendance***
 - ***ICT research community, terrestrial ICT industry, SatCom industry***

6th Advanced Satellite Multimedia Systems **Sept 5 - 7, 2012 in Baiona/Spain** (<http://www.asms2012.org>)

- ❑ **1. Conference organization**
 - **ASMS general chairmanship**
 - **Technical Program Committee**
 - **Financial support**
- ❑ ***Expected attendance***
 - ***ICT research community, SatCom industry, Space agencies***
 - ***ISI members***



ISI Cooperation with National Platforms

ISI has several National Technology Platforms as mirrors

□ **ISI also links with national Technology platforms**

- **The ISI vision and Strategic research agenda are further customized and adapted to national environment to multiply and amplify the reach of the ISI**
- **The national technology Platforms find ISI as the natural channel to launch national initiatives in the overall European context**
- **Example of National Technology Platforms: Spanish eISI (<http://www.ametic.es/idi>)**



Visit us at
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THANK YOU