Fifteenth
KA and BROADBAND COMMUNICATIONS, NAVIGATION and EARTH OBSERVATION CONFERENCE PROGRAM

September 23 – 25, 2009
Cagliari, Italy

Program

WELCOME

The Steering and Organizing Committee welcomes you to the ***15th Ka and Broadband Communications, Navigation and Earth Observation Conference*** *in Cagliari.*
We hope you find this Conference an enlightening and pleasant experience.

ACKNOWLEDGMENTS

The **15th Ka and Broadband Communications, Navigation and Earth Observation Conference** is organized by

FGM Events LLC
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Under the auspice of

ASI – Italian Space Agency, Italy

CRC – Communications Research Centre, Canada

DLR – German Aerospace Center, Germany

ESA – European Space Agency, The Netherlands

NASA – National Aeronautics & Space Administration, USA

NICT – National Institute of Information and Communications Technology, Japan

The Conference Organizers would like to express their gratitude
for the cooperation and the support of the following:

ESA – European Space Agency, The Netherlands

Eutelsat, France

Skylogic, Italy

Space Engineering, Italy

Telespazio, Italy

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Conference web site
http://www.kaconf.org

CONFERENCE SCOPE

The 15th edition of the **Ka and Broadband Communications, Navigation and Earth Observation Conference** is a milestone that invites some introspection.

We started this conference with the express purpose of publicizing the achievements of the Ka band satellites built by Italy, the US and Japan and for the first few years we saw a euphoric growth in interest in Ka band, expressed by worldwide filings for orbital slots and announcements of global systems. But it was not to be. Terrestrial systems expanded to provide the needed communication services, and satellites were left behind. But not for long.

Satellites are now an essential part of our lives, providing communications, video distribution, weather monitoring and forecasting, earth observation, solar system exploration, position location, navigation assistance and security monitoring not only in our homes and offices, but also as we move from place to place.

Our conference continues to update and reshape itself to follow current trends.
Over the years it has expanded from Ka and Broadband Communications to include Navigation and Mobile Systems. Two years ago we introduced Dual Use Systems, and this year we are expanding again to include Earth Observation Systems especially in view of the use of Synthetic Aperture Radar techniques and because of the broadband needed to transmit their Synthetic Aperture Radar signals through Data Relay Satellites to earth.

We have, therefore, solicited papers in all of the following areas:

- New and Updated Broadband Flight Systems
- Distribution of Digital and High Definition Television
- Earth Observation Systems and Applications
- Military and Dual Use Systems and Applications
- Satellite-Aided Navigation
- Mobile Broadband Services
- Broadband Network Systems
- Wideband communications for on-board sensors
- Ground Systems
- Satellite Architectures
- Communications Protocols
- Advances in Components
- Propagation and Fade Mitigation
- Marketing and Regulatory Issues

The Conference hosts the **Seventh BroadSky Workshop** on **"Is space safe enough ?"**, organized in cooperation with **NICT**, the National Institute of Information and Communications Technology of Japan.

The focus of this workshop is the intractable escalating problems of space debris.
With an increasing number of satellites in orbit, the amount of in-orbit debris is approaching a level where collisions could become regular events that can be not only highly damaging to the satellite with economic, insurance and service delivery consequences, but also catalyze further collisions by producing more debris.
The discussion is on ongoing and future space activities, with a view to identifying technologies that can contribute to counteracting the rising menace of space debris.

COMMITTEES

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Marco Brancati, *Telespazio, Italy*
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Mario Caron, *Communications Research Centre, Canada*
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Carlo Elia, *ESA, The Netherlands*
Hector Fenech, *Eutelsat, France*
Richard T. Gedney, *ECC - Efficient Channel Coding, USA*
Naoto Kadowaki, *NICT, National Institute of Information and Communications Technology*
Nafiz Karabudak, *Lockheed Martin Corp., USA*
Cosimo La Rocca, *Finmeccanica, Italy*
Marco Lisi, *ESA/ESTEC, The Netherlands*
Giacinto Losquadro, *Thales Alenia Space, Italy*
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Antonio Vernucci, *Space Engineering, Italy*
Roberto Viola, *AGCOM, Italy*
Wallace D. Williams, Space *Consultant, USA*

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THE SEVENTH BROADSKY WORKSHOP

Is Space Safe Enough?

The focus of this workshop will be the intractable escalating problems of space debris.

With the increasing number of satellites in orbit, the amount of in-orbit debris is approaching a level where collisions could become regular events that can be not only highly damaging to the satellite with economic, insurance and service delivery consequences, but also catalyze further collisions by producing more debris.

At this workshop, we will discuss ongoing and future space activities, with a view to identifying technologies that can contribute to counteracting the rising menace of space debris.

The **Workshop** is organized by

NICT - National Institute of Information and Communications Technology, Japan

Workshop Chair

Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

Vice Chair

Naoto Kadowaki, *National Institute of Information and Communications Technology, Japan*

Technical Committee

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Clotilde Canepa Fertini, *FGM Events LLC, USA*

CONFERENCE PROGRAM OVERVIEW

Wednesday, September 23, 2009

08:30 – 09:00	*Registration*
09:00 – 09:15	Room A **- Opening Session** **Opening Remarks by:** - Frank Gargione, *Space Systems Consultant, USA* - Franco Marconicchio, *Space Consultant, Italy* **Special Remarks by:** - Enrico Saggese, *President of the Italian Space Agency (ASI), Italy*
09:15 – 09:30	Room A - Invited Speech **Historical Perspective: The SIRIO-1 Satellite, a Precursor of the Commercial Ku-Ka Band Satellite Communications** Giorgio Perrotta, *SpaceSys, Italy*
09:30 – 10:45	Room A - Session 1: **Earth Observation Systems** Chair: Luciano Guerriero, *University of Bari, Italy*
10:45 – *11:15*	*Coffee Break*
11:15 – 12:45	Room A Session 2: **Ka Band Becoming Reality for Consumer and Professional Services** Chair: Arduino Patacchini, *Eutelsat, France*
12:45 – 14:30	*Lunch Break*
14:30 – 15:45	Room A - **7th BroadSky Workshop** on **"Is Space Safe Enough?"** Chair: Hajime Fukuchi, *Tokyo Metropolitan University, Japan* Room B - Session 3: **Military and Dual Use Systems and Applications I** Chair: Pietro Finocchio, *TELEDIFE, Italian Ministry of Defence, Italy*
15:45 – 16:15	*Coffee Break*
16:15 – 17:45	Room A - **7th BroadSky Workshop** on **"Is Space Safe Enough?"** (continued) Room B - Session 4: **Propagation and Fade Mitigation** Aldo Paraboni, *Polytechnic of Milan, Italy*
18:00	*Visit to the Skylogic Mediterraneo Teleport Plant, Welcome Cocktail and Excursion in Cagliari and surroundings.*

Thursday, September 24, 2009

08:30 – 09:00	*Registration*
09:00 – 10:00	Room A - Session 5: **Earth Observation Applications I** Chair: Lanfranco Zucconi, *Carlo Gavazzi Space, Italy* Room B - Session 6: **Navigation: Galileo/GPS Applications** Chair: Cosimo La Rocca, *Finmeccanica, Italy*
10:00 – 11:00	Room A - Session 7: **Earth Observation Applications II** Chair: Fausto Perri, *e-GEOS, Italy* Room B - Session 8: **Military and Dual Use Systems and Applications II** Chair: Thomas Butash, *BAE Systems, USA*
11:00 – 11:30	*Coffee Break*

11:30 – 12:45	Room A - Session 9: **Broadband Network Systems** Chair: Richard Gedney, *ECC / ViaSat, USA* Room B - Session 10: **Communication Protocols I** Chair: Antonio Vernucci, *Space Engineering, Italy*
12:45 – 14:30	*Lunch Break*
14:30 – 15:45	Room A - Session 11: **Earth Observation Systems II** Chair: Giuseppe Angino, Thales Alenia Space*, Italy* Room B -Session 12: **Navigation: Galileo/GPS Applications** Chair: Mario Blanco, *Mitre, USA*
15:45 – 16:15	*Coffee Break*
16:15 – 17:30	Room A - Session 13: **Satellite Architectures** Chair: Wallace Dan Williams, *Space Consultant, USA* Room B - Session 14: **Satellite-aided Navigation** Chair: Mario Caron, *CRC – Communications Research Center, Canada*
20:00 – 22:30	*Conference Dinner*

Friday, September 25, 2009

08:30 – 09:00	*Registration*
09:00 – 10:30	Room A - Session 15: **Optical Communications** Chair: Naoto Kadowaki, *NICT, Japan* Room B - Session 16: **Antennas** Chair: Roberto J. Acosta, *NASA Glenn Research Center, USA*
10:30 -11:00	*Coffee Break*
11:00 – 12:30	Room A - Session 17: **Advances in Components** Chair: Marco Brancati, *Telespazio, Italy* Room B - Session 18: **Communications *Protocols II*** *Chair: Roberto Somma, Thales Alenia Space*, Italy
12:30 – 12:45	Room A Invited Speech: **Where is Ka-band service headed?** Roger Rusch, *TelAstra, USA*
12:45 – 13:00	Room A - Closing Session **Closing Remarks**
13:00 – 14:30	*Lunch Break*
15:00 – 18:00	*Visit to the construction site of the Sardinia Radio Telescope.*

CONFERENCE PROGRAM

Wednesday, September 23, 2009

09:00 – 09:15

OPENING SESSION

Opening Remarks by:

- Frank Gargione, *Space Systems Consultant, USA*
- Franco Marconicchio, *Space Consultant, Italy*

Special Remarks by:

- Enrico Saggese, *President of the Italian Space Agency (ASI), Italy*

09:15 – 09:30 – Room A

Invited Speech:

Historical Perspective: The SIRIO-1 Satellite, A Precursor of the Commercial Ku-Ka Band Satellite Communications
Giorgio Perrotta, *SpaceSys, Italy*

09:30 – 10:45 – Room A

SESSION 1: **Earth Observation Systems I**
Chair: Luciano Guerriero, *University of Bari, Italy*

COSMO-SKYMED Operative Qualification: Objectives, Methodologies, Results
Enrico Zampolini Faustini, Andrea Gallon, *Thales Alenia Space, Italy*
Claudia Fiorentino, Giuseppe Francesco De Luca, *Italian Space Agency (ASI), Italy*
Graziano Marano, *Italian Ministry of Defense, SGD-DNA, Italy*

SAR Data Characterization and Engineering Algorithms: COSMO-SkyMed Image Performance Frontier
Fabrizio Impagnatiello, *Thales Alenia Space, Italy*

COSMO-SkyMed - The Italian EO Constellation for Risk Management and Security: Performance Potentiality and Evolution
Francesco Caltagirone, *Italian Space Agency (ASI), Italy*
Graziano Marano, *Italian Ministry of Defense, SGD-DNA, Italy*
Giuseppe Angino, Fabrizio Impagnatiello, *Thales Alenia Space, Italy*

COSMO-SkyMed: End-to-End Management Process for Anomaly Tracing and Solving
Francesca Spataro, *Thales Alenia Space, Italy*
Giuseppe Francesco De Luca, *Italian Space Agency (ASI), Italy*
Graziano Marano, *Italian Ministry of Defense, SGD-DNA, Italy*

COSMO-SkyMed Power Subsystem Technology, Models and in Orbit Results
Edmondo Scorzafava, *Italian Space Agency (ASI), Italy*
Giorgio Daprati, Marco Manfreda, Stefano Costantini, Gioia Perrone, Diego Antongirolami, *Thales Alenia Space, Italy*

10:45 – 11:15 – Coffee Break

11:15 – 12:45 – Room A

SESSION 2: **Ka Band Becoming Reality for Consumer and Professional Services**
Chair: Arduino Patacchini, *Eutelsat, France*

Ka Band Becoming Reality for Consumer and Professional Services
Guillaume Benoit, Stefano Pezzana, *Eutelsat, France*

Network Requirements for Next Generation IP Based Satellite Services
Peter C.Tomsu, George Tupy, Mark Noe, *CISCO Systems, France*

The KA-SAT System
Hector Fenech, Emmanuel Lance, Alessia Tomatis, Maria Kalama, *Eutelsat, France*

Ka-band Geosynchronous Satellites: 100 Gbps and Beyond
Marc Agnew, *ViaSat, USA*

Tooway plus. Study and Implementation of Advanced Applications in Ka Band
Luca Carniato, *Opensky-Italia, Italy*

Satellite News Gathering Based on Tooway System and Service Improvements by IP Multicast
Matteo Maglioli, Roberto Borri, *CSP, Italy*

12:45 – 14:30 – Lunch

14:30 – 15:50 – Room A

7TH **BROADSKY WORKSHOP**
Is Space Safe Enough ?
Chair: Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

14:30 – 14:35

Opening Remarks
Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

14:35 - 15:15

Future Satellite Communications – Looking for a Candidate of Japan's Next Projects
T. Iida, *Special Advisor, AIAA -JFSC, Japan*

15:15 - 15:50

Possibility and Challenge for Space Debris Mitigation
Shinichi Rimura, *Tokyo University of Science, Japan*

14:30 – 15:45 – Room B

SESSION 3: **Military and Dual Use Systems and Applications I**
Chair: Pietro Finocchio, *Italian Ministry of Defence, TELEDIFE, Italy*

The German Space Based Radar Reconnaissance System SAR- Lupe
Fritz Merkle, *OHB System, Germany*

Constellation of Small Satellites in Intermediate Circular Orbits (ICO) for Dual-use Data Relay System
Giorgio Perrotta, *SpaceSys, Italy*

The COSMO-SkyMed Seconda Generazione (CSG) Program
Claudio Galeazzi, Mario Cosmo, Arnaldo Capuzi, *Agenzia Spaziale Italiana (ASI), Italy*
Graziano Marano, *Italian Ministry of Defense, SGD-DNA, Italy*
Lucio Bianchi, *Italian Ministry of Defence, Italy*

ATHENA FIDUS Satellite: a Flexible System to Insure Broadband Communication Capabilities to Italian and French Government Institutions
Enrico Russo, *Agenzia Spaziale Italiana, Italy*
G.B. Durando*, Italian Ministry of Defense, TELEDIFE, Italy*
J.P. Diris, P. Dumont, *CNES, France*

An IP-based Cognitive Architecture for the Italian SatCom Dual Use Infrastructure
Giacinto Losquadro, Giuseppe Tomasicchio, Paolo Conforto, *Thales Alenia Space, Italy*

15:30 – 16:00 – Coffee Break

16:00 – 17:45 – Room A

7TH **BROADSKY WORKSHOP**
Is Space Safe Enough ? *(continued)*

16:00 – 16:35

Overcrowded Geostationary Orbits and Safety-Monitoring Techniques
Seiichiro Kawase, *NICT, Japan*

16:35 – 17:10

Space Debris Introduction & Mitigation Research in ASI
Claudio Portelli, *ASI (italian Space Agency), Italy*

17:10 – 17:40

TBD

17:40 – 17:45

Closing Remarks
N. Kadowaki , *NICT, Japan*

15:45 – 17:45 - Room B

SESSION 4: **Propagation and Fade Mitigation**
Chair: Aldo Paraboni, *Polytechnic of Milan, Italy*

Path Length Fluctuations Derived from Site Testing Interferometer Data
Roberto J. Acosta, James A. Nessel, *NASA Glenn Research Center, USA*

Verification of Propagation Impairment Mitigation Techniques
Carlo Capsoni, Aldo Paraboni, Carlo Riva, Emilio Matricciani, Lorenzo Luini, *Polytechnic of Milan, Italy*
Laurent Castanet, Nicolas Jeannin, Guillaume Carrie, *ONERA, France*
Piero Gabellino, Gennaro Gallinaro, Nicola Gatti, *Space Engineering, Italy*
Antonio Martellucci, Juan Rivera Castro, *ESA/ESTEC, The Netherlands*

Ka-band Measurements on DVB-S2 ACM System
Pascal Hoarau, Patricia Inigo, Nicolas Girault*, EADS Astrium, France*
Cédric Le Guern, *Assystem, France*

Real-Time Fade Mitigation Using Radiometric Measurements for Future Ka-Band Services at DLR
Yunir Gataullin, *German Space Operations Center (DLR), Germany*

VCM Techniques for Ka-Band LEO Satellites
Mario Cossu, Domenico Giancristofaro, Michelangelo L'Abbate, Emiliano Ricciardi, Carlo Svara, Paolo Venditti, *Thales Alenia Space, Italy*
Aldo Paraboni, Carlo Riva, *Polytechnic of Milan, Italy*
Josep Rosello, Antonio Martellucci, *European Space Agency (ESA), The Netherlands*

Using GNU-Radio for Satellite Beacon Detector
Emanuel Rodrigues, Armando Rocha, *University of Aveiro, Portugal*
Adrian David, *Technical University of Cluj-Napoca, Romania*

Identification of the Propagation Depolarization Matrix at 50 Ghz using Italsat Data
Aldo Paraboni, Carlo Capsoni, Carlo Riva, *Polytechnic of Milan, Italy*
Antonio Martellucci, *ESA/ESTEC, The Netherlands*

09:00 – 10:00 – Room A

SESSION 5: **Earth Observation Applications**
Chair: Lanfranco Zucconi, *Carlo Gavazzi Space, Italy*

Damage Assessment after the Earthquake in L'Aquila. Use of the COSMO-SkyMed Products
Giovanni Valentini, Fabio Covello, Alessandro Coletta, Gemma Manoni, Fabrizio Battazza, *ASI (Italian Space Agency), Italy*
Stefano Salvi, Marco Chini, Simone Atzori, *INGV, Italy*

Distributed Power Grid Management Based on Space Technologies
L. Tampellini, *Carlo Gavazzi Space, Italy*
F. Ongaro, *ESA, France*
S. Tselepis, *Centre for Renewable Energy Sources, Greece*
M. Schroedter-Homscheidt, C. Hoyer-Klick, *German Aerospace Center (DLR), Germany*
E. Vellucci, *TERNA, Italy*
C. Hasager, *RISOE Wind Energy Department, Denmark*

A Telecom Compatible Geosynchronous SAR System
Andrea Monti Guarnieri, Fabio Rocca, *Polytechnic of Milan, Italy*

Metereology and Climatology Through GNSS Signal Radio Occultation
Valeria Catalano, Vittorio De Cosmo, Francesco Vespe, *ASI (Italian Space Agency), Italy*

09:00 – 10:00 – Room B

SESSION 6: **Navigation: Galileo/GPS Applications I**
Chair: Cosimo La Rocca, *Finmeccanica, Italy*

Selecting Satellites to Track in MEOSAR Next Generation Search and Rescue Satellite System
Richard Paiement, Mario Caron, *Communications Research Centre, Canada*

Implementation of a GALILEO Receiver Aimed at Estimating the Navigation Payload Signal Generator Performances
Carlo Cornacchini, Paolo Tabacco, *Space Engineering, Italy*

GIOVE Signal-in-Space measurements at Thales Alenia Space Facility
Salvatore Corvo, Vittorio Valle, Monica Gotta, Francesco Pasquale Martinino, Mauro Marinelli, F. Paggi, *Thales Alenia Space, Italy*

PVT Performances of Combined Satellite Constellations
Daniele Cretoni, Vittorio Valle, Monica Gotta, *Thales Alenia Space, Italy*

10:00 – 11:00 – Room A

SESSION 7: **Earth Observation Applications II**
Chair: *Fausto Perri, e-GEOS, Italy*

GlobVolcano Project Overview
L. Tampellini, R. Ratti, *Carlo Gavazzi Space, Italy,*
S. Borgström, *INGV, Italy*
Frank Martin Seifert, *ESA/ESRIN, Italy*

Satellite Derived Air Quality Products Developed in QUITSAT Project
Walter Di Nicolantonio, Alessandra Cacciari, *Carlo Gavazzi Space at ISAC-CNR, Italy*
Andrea Petritoli, Claudio Tomasi, *Institute of Atmospheric Science and Climate, ISAC-CNR, Italy*
Claudio Carnevale, Enrico Pisoni, Maria Luisa Volta, *University of Brescia, Italy*
Paolo Stocchi, Gabriele Curci, *CETEMPS, Department of Physics, University of L'Aquila, Italy*
Ezio Bolzacchini, Luca Ferrero, *University of Milano Bicocca, Italy*
Cristina Ananasso, *ASI (Italian Space Agency), Italy*

COSMO-SkyMed for Emergencies: the Abruzzo Case
Marina Doubell, Vita Antonia Loré, Antonio Valentino, *INNOVA, Italy*
Giovanni Milillo*, ASI-CGS, Italy*

10:00 – 11:00 – Room B

SESSION 8: **Military and Dual Use Systems and Applications II**
Chair: Thomas Butash, *BAE Systems, USA*

Advanced Hybrid-ARQ for Robust Satellite Communications in Stressed Environments
Mario Blanco, MITRE Corp. , USA

Dual Use Unmanned Aerial Vehicles and Mobile Satellite Services Cooperative Mission Perspective: a Study Case
Vincenzo Schena, *Thales Alenia Space, Italy*

European Data Relay System: Modular Conception for an Evolving Ka Band Infrastructure
Paolo Conforto, Giacinto Losquadro, Roberto Winkler, *Thales Alenia Space, Italy*

Communication Services exploiting ATHENA-FIDUS Ka regenerative and transparent transponders
Marco Brancati, Antonio Ceccarelli, Marco Certelli, Ennio Guarino, *Telespazio, Italy*

Current status and applications of COSMO-SkyMed Satellite Mission During 2008 and 2009
Fabio Covello, Fabrizio Battazza, Alessandro Coletta, Gemma Manoni, Giovanni Valentini, *ASI (Italian Space Agency), Italy*

11:00 – 11:30 – Coffee Break

11:30 – 12:30 – Room A

SESSION 9: **Broadband Network Systems**
Chair: Richard Gedney, ECC / *ViaSat, USA*

Proof of concept of a High-Throughput Processor for Broadband Access Networks
Stephen Brown, David Howe, Robert Hughes, *Astrium Ltd., United Kingdom*
Giuseppe Chiassarini, Daniele Gianfelici, Paolo Altamura, *Space Engineering, Italy*
Piero Angeletti, *European Space Agency, The Netherlands*

A Game - Theoretic Approach of Power Control Schemes in Satellite Communication Networks
Stavroula Vassaki, Athanasios D. Panagopoulos, Philip Constantinou, *ICCS-National Technical University of Athens, Greece*

Design Concepts for the Polar Communications and Weather Mission
Jaafar Cherkaoui, Mark Wlodyka, Arthur Baylis, *MDA, Canada*

1244 Mbps High-Speed Network for Winds Bent-Pipe-Relay Mode
Mitsugu Ohkawa, Akira Akaishi, Takashi Takahashi, *NICT, Japan*
Hisanori Tsuji, Susume Kitazume, *Jepico, Japan*
Sameep Dave, Amit Dugar, Richard Gedney, Efficient Channel Coding (ECC)/*ViaSat, USA*

11:30 – 12:30 – Room B

SESSION 10: **Communication Protocols I**
Chair: Antonio Vernucci, *Space Engineering, Italy*

Rate-Control System with Heterogeneous Time-varying Delays in Broadband Satellite Networks
Hui Zeng, Michael Hadjitheodosiou, John S. Baras, *HyNet, University of Maryland, USA*

An Adaptive Multi-carrier Channel Allocation Technique for Making Maximum Use of Satellite Resources
Katsuya Nakahira, Kiyoshi Kobayashi, *NTT Access Network Service Systems Laboratories, Japan*

Satellite Terminal Quality of Service Management with AQM Control
Romain Delpoux, *CNRS-LAAS, France* and *Chalmers University, Goteborg, Sweden*
Pascal Berthou, Frederic Gouaisbaut, Yann Labit, *CNRS-LAAS and Toulouse University of Science, France*

Probabilistic Non-Repudiation for Source Authentication with TESLA Certificates in Hybrid Satellite/Wireless Networks and Performance Analysis of the Authentication Protocol
Ayan Roy-Chowdhury, John S. Baras, *HyNet, University of Maryland, USA*

12:30 – 14:30 – Lunch

14:30 – 15:45 – Room A

SESSION 11: **Earth Observation Systems II**
Chair: Giuseppe Angino, *Thales Alenia Space, Italy*

The PRISMA Program
Claudio Galeazzi, *ASI (Italian Space Agency), Italy*
Paolo Sabatini , *Carlo Gavazzi Space, Italy*
Andrea Cisbani, *Galileo Avionica, Italy*
Gianni Babini, *Rheinmetall Italia, Italy*

COSMO-SkyMed: Image quality achievements
Andrea Torre, D. Calabrese, *Thales Alenia Space, Italy*
Manfredi Porfilio, *ASI (Italian Space Agency), Italy*
Graziano Marano*, Italian Ministry of Defense, SGD-DNA, Italy*

COSMO-SkyMed System/Service Availability Evaluation Method
Edmondo Scorzafava, Giuseppe Francesco De Luca, *ASI* (*Italian Space Agency), Italy*
Anna Croce, Danilo Vicari, *Thales Alenia Space, Italy*

COSMO-SKYMED: End-to-End Verification
Enrico Zampolini Faustini, *Thales Alenia Space, Italy*
Giuseppe Francesco De Luca, Edmondo Scorzafava, Manfredi Porfilio, *ASI (Italian Space Agency), Italy*

COSMO-SKYMED End to End System Calibration Strategies and Evolution
Valerio Grimani, Alessandro Criceti, *Thales Alenia Space, Italy*
Claudia Fiorentino, Manfredi Porfilio, *ASI (Italian Space Agency), Italy*

14:30 – 15:45 – Room B

SESSION 12: **Navigation: Galileo/GPS Applications II**
Chair: Mario Blanco, *The Mitre Corp., USA*

Localization & Communication Integrated Application for Safety and Security
Marco Manca, Luca Bocci, Manuela Rossi, *Telespazio, Italy*

Application Platforms for the Management of Maritime Navigation
Mario Gaetano Di Dio, Vincenzo Vinni, *ITS-Information Technology Services, Italy*

Navigation Applications of Vehicles Mobility
Gianluca Gargiulo, Luigi Mazzucchelli, *Next Ingegneria dei Sistemi, Italy*
Mario Caporale, Giancarlo Varacalli, *ASI (Italian Space Agency), Italy*

Navigation Applications Supporting the Mobility of Disabled People: the NADIA Project
Francesca Neccia, Roberto Muscinelli, *Thales Alenia Space,Italy*
Mario Caporale, Giancarlo Varacalli, *ASI (Italian Space Agency), Italy*

15:45 – 16:15 – Coffee Break

16:15 – 17:30 – Room A

SESSION 13: **Satellite Architectures**
Chair: Wallace Dan Williams, *Space Consultant, USA*

Tx Section Connectivity For Flexible Payload: Concepts and Strategies For Analysis
Immacolata De Nunzio, Alessandro Pisano, *Thales Alenia Space, Italy*

Geostationary Satellite Replacements with Brandon Molniya Systems
Paul Christopher, *PFC Associates, USA*

QoS Management in Integrated Satellite-Terrestrial Network for Distance Learning
Rosalba Suffritti, Luca Simone Ronga, Enrico Del Re*, CNIT University of Florence Research Unit, Italy*
Amedeo Scarpiello, Paolo Orefice, *CNIT National Laboratory for Multimedia Communications, Italy*

Payload Flexibility For Secure Applications
Silvio De Vita, Giampiero Di Paolo, Vincenzo Marziale, Alessandro Pisano, *Thales Alenia Space, Italy*

Future EDRS System Architectures
Hector Fenech, Maria Kalama, Alessia Tomatis, Emmanuel Lance, *Eutelsat, France*

16:15 – 17:30 - Room B

SESSION 14: **Satellite-Aided Navigation**
Chair: Mario Caron, *Communications Research Center (CRC), Canada*

ESA Iris Programme: Satellite System for the European Air Traffic Management
Domenico Mignolo, Nathalie Ricard, Salvatore D'Addio, Alfredo Vernucci, Catherine Morlet, *European Space Agency (ESA), The Netherlands*

Effects of Payload And Receiver Distortions On GNSS Signal Performance
Piero Angeletti, Marco Lisi, Manuela Rapisarda, *European Space Agency (ESA), The Netherlands*

Regulatory Issues for Aeronautical and Maritime Mobile Satellite Systems using Fixed Satellite Service bands
Guy Christiansen, *CGP Solutions, Italy*

Analysis of Performances of NIORAIM Algorithm Implementation in a GNSS Monitoring System: Verification of RAIM Availability in Various Phases of Flight
Paola Madonna, Sabina Viola, Luca Sfarzo, *TRS, Italy*

NavCom Space-Based Systems

09:00 – 10:30 – Room A

SESSION 15: **Optical Communications**
Chair: Naoto Kadowaki, *NICT, Japan*

Fine Tracking System for Aeronautical FSO Links
Christian Fuchs, *German Aerospace Center (DLR), Germany*

JAXA's Activities for Next Generation Inter-Orbit Optical Communication System
Shiro Yamakawa, *Japan Aerospace Exploration Agency (JAXA), Japan*

Assessment of Experiment Windows for Optical Communication Between OICETS and Ground Stations
Yoishiyuki Tashima, *Space Engineering Development Co., Ltd., Japan*
Yoshihisa Takayama, *NICT, Japan*
Minoru Sakaue, Japan *Aerospsce Exploration Agency (JAXA), Japan*

Status and Outlook on High Data Rate Optical Inter-Satellite Links Verified in Orbit
Robert Lange, Frank Heine, Hartmut Kämpfner, Gerd Mühlnikel, *Tesat-Spacecom, Germany*
Rolf Meyer, *German Aerospace Center (DLR), Germany*

Phase-2 Conceptual Design of Optical Terminals for Satellite Quantum Key Distribution
Morio Toyoshima, Yozo Shoji, Yoshihisa Takayama, Hiroo Kunimori, Masahiro Takeoka, Mikio Fujiwara, Masahide Sasaki, *NICT, Japan*

Terrestrial Networks for Satellite-Ground Laser Communications
Yoshihisa Takayama, Morio Toyoshima, Yozo Shoji, *NICT, Japan*

09:00 – 10:45 – Room B

SESSION 16: **Antennas**
Chair: Roberto J. Acosta, *NASA Glenn Research Center, USA*

Performance of the AstroMesh Deployable Mesh Reflector at Ka-Band Frequencies and Above
Geoffrey Marks, Edward Keay, Steven Kuehn, Michael Fedyk, Peter Laraway, *Astro Aerospace Northrop Grumman Aerospace Systems, USA*

BepiColombo mission to Mercury Design and Development of the High Temperature High Gain Antenna
Maurizio Milano, Paolo Noschese, *Thales Alenia Space, Italy*

Performance Test of Ka Band Multi-beam Antenna
Jang Sup Choi, Seong Pal Lee, In Bok Yom, *ETRI, Korea*

Ground Beamforming and Interference Cancellation for TDMA based Reverse-Link Access Schemes
Filippo Di Cecca, Gennaro Gallinaro, *Space Engineering, Italy*

Very Large Reflectors for Multibeam Antenna Missions
Yves Demers, Aiping Liang, Éric Amyotte, *MDA, Canada*
Edward Keay, Geoffrey Marks, *Astro Aerospace Northrop Grumman Aerospace Systems, USA*

Ku-Band Broadband Antennas for Airborne In-Flight Entertainment Systems: Experimental Results
Lino Russo, M. Albertini, Alfredo Catalani, Marzia Migliorelli, *Space Engineering, Italy*

Directivity of a Sparse Array in the Presence of Atmospheric-Induced Phase Fluctuations for Deep Space Communications
James A. Nessel, Roberto J. Acosta, *NASA Glenn Research Center, USA*

10:30 – 11:00 – Coffe Break

11:00 – 12:00 – Room A

SESSION 17: **Advances in Components**
Chair: Mario Brancati, *Telespazio, Italy*

Ka-band 500 WATT Traveling Wave Tube Amplifiers: New High-Power Uplink Solutions for Ka-Band Satcom Systems
Heidi Thelander, Travis Stewart, John Grant, *Xicom Technology, USA*

Broadband Microwave Phase Shifter Using Photonic Technology
Joe Seregelyi, Stephane Paquet, Howard Rideout, Mario Caron, *CRC-Communications Research Centre Canada*

Ka-Band On-Board Secure TT&C Transponder for YAHSAT Dual-Mode Mission
Sabatino Ciarcia, Lorenzo Simone, F. De Tiberis, Giuseppe. Fittipaldi, M. Delfino, M.G. Campagna F. Barletta, M. Ziarelli , P. Colucci, D. Gelfusa, R. Di Julio, A. Bernardi, *Thales Alenia Space, Italy*

A Ka Band Tunable Filter for Reconfigurable Payload
Ming Yu, Baharam Yassini, Brain Keats, Greg Healy, COM DEV, Canada

11:00 – 12:15 – Room B

SESSION 18: **Communications Protocols II**
Chair: Roberto Somma, *Thalesaleniaspace, Italy*

Techniques for Supporting Communications under Heavy Fading Conditions for Next Generation DVB-RCS Systems
Alberto Ginesi, Alfredo Vernucci, *ESA/ESTEC, The NL*

On-Off Coding of Gaussian Sensor Measurements and Their Forwarding via Satellite
Franco Davoli, Igor Bisio, Maurizio Mongelli, Mario Marchese, *CNIT* and *University of Genoa, Italy*
Nedo Celandroni, Erina Ferro, Alessandro Faedo, *ISTI-CNR, Italy*

A NS-2 Simulation model of DVB-S2/RCS Satellite Network
Thierry Gayraud, Pascal Berthou, CNRS-*LAAS* and *Toulouse University of Science, France*
Lionel Bertaux, *CNRS-LAAS, France*

Improving the MF-TDMA Spectral Efficiency through Symbol Synchronous Operation
Gennaro Gallinaro, Filippo Di Cecca, *Space Engineering, Italy*
Paolo Burzigotti, *ESA/ESTEC, The Netherlands*

Selective Forwarding Cooperation for DVB-RCS Mobile Terminals in Land Vehicular Scenario
Enrico Del Re, Luca Simone Ronga, Rosalba Suffritti, *CNIT University of Florence Research Unit, Italy*

12:15- 12:30 – Room A

Invited Speech on Regulatory Issues:
Where Is Ka-band Service Headed?
Roger Rusch, *TelAstra, USA*

12:30 – 12:45 – Room A

CLOSING SESSION
- Closing Remarks

12:45 – 15:00 – Lunch

GENERAL INFORMATION

Venue

The 15th Ka and Broadband Communications, Navigation and Earth Observation Conference and the 7th BroadSky Workshop are held at the **T Hotel**, via dei Giudicati 66, 09131 Cagliari, Italy, tel. + 39 070 47400, fax + 39 70 47405026.

Language

The working language of the Ka and Broadband Communications Conference and the BroadSky Workshop is English.

Badges

All delegates must wear the badge at all Conference and Workshop events.

Timing of Technical Paper Presentations

As in past conferences, Ka and Broadband Communications Conference technical presentations will be 15 minutes in length. Session Chairs have been instructed to strictly maintain this schedule.
Speakers and chairs should be in the conference room at least 15 minutes before the start of the session.

Meals

Breakfast is included in the room rate at the Conference Hotels. All luncheons and coffee breaks during the Conference, the Welcome Cocktail on Wednesday and the Conference Dinner on Thursday are included in the Conference registration fee.

Accompanying Persons

The Welcome Cocktail Reception admission is free of charge.
Additional companion tickets for the Conference Dinner (Thursday) are available for sale for €75.

Internet Access during Conference

WiFi internet access is possible in every meeting room and in any public space of the Hotel. Rooms provides cable access.

Liability and Insurance

Neither the Conference Organizers, not the Hilton Garden Inn Hotel will assume any responsibility whatsoever for damage or injury to person or property during the Conference. Participants are recommended to arrange for their personal travel and health insurance.

PLANT TOURS

Skylogic Mediterraneo Teleport

Wednesday, September 23, 18:00 – 20:30

Skylogic is pleased to offer the visit to the Skylogic Mediterraneo Teleport , Skylogic's newest teleport location, which is currently under construction at Macchiareddu in Cagliari's industrial park.
This new teleport will provide broadcasting services, a network infrastructure for data transmission and video services (contributions, broadcastings).
On the way back a visit to Cagliari and its surroundings will take place.

Sardinia Radio Telescope

Friday, September 25, 15:00 – 18:00

On September 25, after the Closing Session of the Conference, it is planned a visit to the construction site of the Sardinia Radio Telescope.
The Sardinia Radio Telescope (SRT) is a 64m diameter radio telescope designed to operate with high efficiency in a wide frequency range, from 300MHz to 100GHz, which is currently under construction in Sardinia, about 40 km North of Cagliari. This facility, designed for Radioastronomy, Geodesy and Space Science applications, is co-founded by the Italian Minister of University and Research, by the Italian Space Agency, and by the Sardinian Regional Government. The main mechanical structure is about to be completed, and the scientific commissioning is expected by the middle of year 2010.

Anyone interested in the plant tours can make reservations applying directly at the Conference Registration Desk by noon on Wednesday, September 23. Bus transportation will be provided from/to the Conference site.

SOCIAL EVENTS

Welcome Cocktail

Wednesday, September 24, 19:00

After the visit of the Skylogic Mediterraneo Teleport Plant , Skylogic is pleased to offer a Welcome Cocktail at its facilities.

Conference Dinner

Thursday, September 24, 20:00 – 24:00

REGISTRATION INFORMATION

The Registration Desk opens for on-site registration and material pick up for pre-registered delegates

- on Tuesday, September 22 from 17:00 to 19:00,
- on Wednesday, September 23 from 8:00 to 18:00
  and the following days during the Conference hours.

The payment can be made by credit card (VISA, MasterCard, American Express) and cash.
A single registration fee provides access to the Conference, the Workshop, Plant Tours and Social Events.

Registration fees

Conference Fee before July 24, 2009: Euro 750,00 - after July 24, 2009: Euro 900,00

Included in the Conference registration fee are:

– Access to the technical sessions,
– Access to 7th BroadSky Workshop,
– Proceedings of the Conference (printed book),
– CD ROM of the Conference Proceedings,
– 6th BroadSky Workshop presentations booklet,
– Coffee breaks (Wednesday, Thursday, Friday, September 23, 24, 25),
– Lunches (Wednesday, Thursday, Friday, September 23, 24, 25),
– Guided Tour on Wednesday, September 23,
– Welcome Cocktail Reception on Wednesday, September 23,
– Conference Dinner on Thursday, September 24,
– Plant tours on Wednesday, September 23 and on Friday, September 25.

Additional Options

(in addition to full registration fee)

– Proceedings of the Conference (printed book and CD ROM): € 150
– Companion Conference Dinner Ticket: € 75

Cancellation and Refund Policy

Registration fee (75%) can be refunded only if notification is given in writing before September 1, 2007. After this date, the registration fee will not be refunded and the Conference Proceedings (book and CD-ROM) will be mailed to the registrant.
All refunds will be processed after the Conference.

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