

## WELCOME

*The Steering and Organizing Committee welcomes you  
to the **13<sup>th</sup> Ka and Broadband Communications Conference** in Turin.  
We hope you will find this Conference an enlightening and pleasant experience.*

## CONFERENCE SCOPE

The Ka and Broadband Conference was started to publicize the technology and the results achieved by Italsat, ACTS and ETS, programs financed by the space agencies of Italy, the United States and Japan and aimed at advancing the state of the art in satellite broadband communications.

The conference quickly became the focal point of the new developments in satellite advances at Ka Band, and the forum for the presentation of the many global and regional Ka Band satellite systems proposed in the late nineties.

When the promise of those systems did not materialize as expected, the Conference's emphasis was expanded to include the topics of mobile broadband communications and satellite-aided navigation, but no new advances in the field of commercial satellite communications were presented because of the lack of investment by the industry and lack of support by the space agencies.

There have been advances, however, in the military and dual use applications in the field of telecommunications, navigation and earth observation. Therefore we have decided to include in the 2007 conference these new areas of activity so as to be able to continue presenting the latest advances in the technology and use of innovative satellite systems.

In new military and military and civil (dual use) systems a lot of effort is being spent by the US DOD to modernize the GPS navigation constellation, to develop net-centric capabilities and the Wideband Gapfiller and XTAR satellites.

In Europe, ESA is proceeding with the development of the Galileo navigation constellation.

The French DOD recently launched the Syracuse military communication payload and is developing the Pleiades dual use high-resolution optical Earth Observation system to be launched in 2009 to complement the Italian CosmoSkyMed dual use X band observation constellation scheduled for launch at the end of 2007.

The Italian DOD operates the military telecommunication satellite SICRAL, soon to be augmented by SICRAL II.

Germany is close to launching the TerraSAR-X followed in 2009 by TanDem-X observation satellites for military and government agencies.

Finally, England is developing Skynet for military communications and Topsat for earth observation.

The Conference has therefore solicited papers in these new areas along with the traditional areas covered in the past:

- **Military and Dual Use Systems and Applications**
- **Satellite-Aided Navigation and related applications**
- **Mobile Broadband Services**
- **New and Updated Broadband Flight Systems**
- **Advances in Components and Ground Systems**
- **Satellite Architectures**
- **Communications Protocols**
- **Propagation and Fade Mitigation**
- **Marketing and Regulatory Issues**

## CONFERENCE COMMITTEES

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**Kaji Foscoli**, *IIC - Istituto Internazionale delle Comunicazioni, Italy*

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**Wallace D. Williams** - *NASA Glenn Research Center, USA*

### Secretariat Contact

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# THE FIFTH BROADSKY WORKSHOP

## The Potential of Lasers for Wideband Communications in Space

The **5th BroadSky Workshop** intends to discuss on features, past and current developments, but also future applications of free-space laser and broadband communications. For an efficient collaboration on the development of future communication systems, the discussion will focus on the selection of wavelengths and communication protocols according to applications, and the interoperability like SNIP as well.

The **Workshop** is organized by

**NICT** – National Institute of Information and Communications Technology, Japan

**YRP** – Yokosuka Research Park, Japan

### Workshop Chair

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

### Vice Chair

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**Morio Toyoshima**, *National Institute of Information and Communications Technology, Japan*

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**Clotilde Canepa Fertini**, *Istituto Internazionale delle Comunicazioni, Italy*

## ACKNOWLEDGMENTS

The 13th Ka and Broadband Communications Conference is

organized by

**IIC** – Istituto Internazionale delle Comunicazioni, Italy

under the auspices of

**ASI** – Agenzia Spaziale Italiana, 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

and sponsored by

**European Satellite Navigation Industries**, Germany

**ESA – European Space Agency**, The Netherlands

**Finmeccanica**, Italy

**Skylogic**, Italy

**Space Engineering**, Italy

**Telespazio**, Italy

**Thales Alenia Space**, Italy

# CONFERENCE PROGRAM OVERVIEW

Monday, September 24

08:00 – 09:00	<i>Registration</i>
09:00 – 09:15	<b>Opening</b> (Room Basilica 1+2)
09:15 – 10:30	<b>Session 1: Broadband Systems 1</b> (Room Basilica 1+2)
10:30 – 11:00	<i>Coffee Break</i>
11:00 – 12:30	<b>Session 2: Satellite-Aided Navigation and Related Applications 1</b> (Room Basilica 1) <b>Session 3: Satellite Architectures 1</b> (Room Basilica 2)
12:15 – 14:00	<i>Lunch</i>
14:00 – 15:30	<b>Fifth BroadSky Workshop</b> (Room Basilica 1+2)
15:30 – 15:50	<i>Coffee Break</i>
15:50 – 17:45	<b>Fifth BroadSky Workshop</b> (Room Basilica 1+2)
18:00 – 21:30	<i>Private Visit of the Egyptian Museum and Cocktail Reception at the Mole Antonelliana</i>

Tuesday, September 25

09:00 – 10:15	<b>Session 4: Military and Dual Use Systems and Applications 1</b> (Room Basilica 1) <b>Session 5: Propagation</b> (Room Basilica 2)
10:15 – 10:35	<i>Coffee Break</i>
10:35 – 11:50	<b>Session 6: Galileo</b> (Room Basilica 1) <b>Session 7: Satellite Architectures 2</b> (Room Basilica 2)
11:50 – 13:05	<b>Session 8: Communication Protocols 1</b> (Room Basilica 1) <b>Session 9: Advances in Components 1</b> (Room Basilica 2)
13:05 – 14:30	<i>Lunch</i>
14:30 – 16:15	<b>Session 10: Mobile Broadband Services</b> (Room Basilica 1) <b>Session 11: Antenna Systems</b> (Room Basilica 2)
16:15 – 16:45	<i>Coffee Break</i>
16:45 – 18:00	<b>Session 12: Interplanetary Communications</b> (Room Basilica 1) <b>Session 13: Advances in Components 2</b> (Room Basilica 2)
20:00 – 24:00	<i>Conference Dinner at “Ciacolon” Restaurant</i>

Wednesday, September 26

09:00 – 10:15	<b>Session 14: Military and Dual Use Systems and Applications 2</b> (Room Basilica 1) <b>Session 15: Communication Protocols 2</b> (Room Basilica 2)
10:15 – 10:30	<i>Coffee Break</i>
10:30 – 12:00	<b>Session 16: Satellite-Aided Navigation and Related Applications 2</b> (Room Basilica 1) <b>Session 17: Fade Mitigation</b> (Room Basilica 2)
12:00 – 13:15	<b>Session 18: Broadband Systems 2</b> (Room Basilica 1) <b>Session 19: Advances in Components 3</b> (Room Basilica 2)
13:15 – 13:25	<b>Closing Session</b> (Room Basilica 1)
13:25 – 14:30	<i>Lunch</i>
15:00 – 17:30	<i>Thales Alenia Space Plant &amp; Civil Protection Centre Tour</i>

# CONFERENCE PROGRAM

Monday, September 24

08:00 - 09:00 – Registration Desk

**Registration and material pick up**

09:00 - 09:15 - Room Basilica 1+2

**Opening Session**

**Opening Remarks by:**

Frank Gargione, *Satellite Systems Consultant, USA*

Franco Marconicchio, *ASI, Italy*

Enrico Saggese, *Finmeccanica, Italy*

09:15 - 10:30 - Room Basilica 1+2

Session 1: **Broadband Systems 1**

Chaired by: **Richard T. Gedney**, *Efficient Channel Coding, USA*

K000085

**Design Aspects for Ka-Band Satellite Missions**

Hector Fenech, Emmanuel Lance, Alessia Tomatis, *EUTELSAT, France*

K000024

**WAVE-A2: Towards New Frontiers of EHF Satellite Telecommunications**

Marco Lucente, Emiliano Re, Tommaso Rossi, Marina Ruggieri, Ernestina Cianca, Ahmed Jebri, *University of Rome "Tor Vergata", Italy*

Lamberto Zuliani, Mirko Albani, *ASI, Italy*

K000006

**Adaptive Downlink Power Control Effects in Satellite Communication Networks: Interference Statistical Distribution**

Athanasios D. Panagopoulos, Theodor D. Kritikos, John D. Kanellopoulos, *National Technical University of Athens, Greece*

K000110

**BRASIL: Broadband to Rural America over Satellite Integrated Links**

Harald Skinnemoen, *AnsuR Technologies, Norway*

Maria Angeles Vazquez Castro, *Univesitat Autònoma de Barcelona, Spain*

Roberto Aroso, *Telecom, Brazil*

K000019

**Interference Analysis for Digital Modulation Systems in Ka-Band Multi Beam Satellites**

Anil Kumar Sisodia, Arun Kumar Singh, *Space Applications Centre, Indian Space Research Organisation, India*

10:30 - 11:00 – Coffee Break

11:00 - 12:30 - Room Basilica 1

Session 2: **Satellite-Aided Navigation and Related Applications 1**

Chaired by: **Cosimo La Rocca**, *European Satellite Navigation Industries, Italy*

K000011

**Architecture for Aeronautical Communications for the Airport Surface and Vicinity**

Robert J. Kerczewski, NASA Glenn Research Center, USA

Rafael D. Apaza, *Federal Aviation Administration, USA*

K000022

**SESTANTE: Applications Based on New Generation Satellite Technologies**

Sandro Bevilacqua, Simone Marri, *Vitrociset, Italy*

Salvatore Viviano, Mario Caporale, *ASI, Italy*

K000026

**Performance of Assisted Acquisition of the L2CL Code**

Ayse Sicramaz Ayaz, Thomas Pany, Felix Kneissl, Bernd Eissfeller, *University FAF Munich, Germany*

K000001

**Evaluation of Prioritized Link Access Options for VHF Data Link (VDL) Mode 2 Technology**

Rafael D. Apaza, *Federal Aviation Administration, USA*

Steven C. Bretmersky, *Cleveland State University, USA*

K000027

**Satellite-Aided Navigation and Related Applications for Dangerous Transport**

Gianfranco Burzio, Sergio Damiani, Fulvio Sommariva, *Centro Ricerche FIAT, Italy*

Diego Orgiazzi, *Istituto Superiore Mario Boella, Italy*

Andrea Tomatis, Francesco Deflorio, *Politecnico di Torino, Italy*

Fabrizio Carrai, *Kayser Italia, Italy*

Alessandro Murro, Francesco Alesiani, *Mizar Automazione, Italy*

Barbara Trincone, Luca Ionta, *LOGICA, Italy*

Salvatore Viviano, Mario Caporale, *ASI, Italy*

K000118

**Overview of EGNOS – Galileo regulated applications**

Mario Musmeci, Antonella Di Fazio, Raniero Pasquali, *Telespazio, Italy*

11:00 - 12:00 - Room Basilica 2

Session 3: **Satellite Architectures 1**

Chaired by: **Mario Caron**, *CRC - Communications Research Centre, Canada*

K000010

**High Throughput Fully Processed Payload for Broadband Access Networks**

Robert Hughes, Rosalind Warren, Alijah Ahmed, Alan Couchman, *Astrium, United Kingdom*

Giuseppe Chiassarini, Eugenio Rossini, *Space Engineering, Italy*

Piero Angeletti, *ESA, The Netherlands*

K000012

**An Update of the Italian Q/V-band Experimental Missions**

Victor Speziale, Antonio Vernucci, *Space Engineering, Italy*

Giuseppe Codispoti, Lamberto Zuliani, *ASI, Italy*

Alessandro Pisano, *Thales Alenia Space, Italy*

K000029

**Improving Network Performance in Hybrid Wireless Networks Using a Satellite Overlay**

Ayan Roy-Chowdhury, John S. Baras, *University of Maryland, USA*

K000018

**Analysis and Simulation of a Parallel Packet Switch for Satellite On-board Switching**

Guido Albertengo, Diego Borsetti, *Politecnico di Torino, Italy*

12:15 - 14:00 – Lunch

14:00 - 17:45 - Room Basilica I

**Fifth BroadSky Workshop**

Chair: Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

14:00 – 14:05

**Opening Remarks**

Hiroyo Ogawa, *NICT, Japan*

14:05 – 14:15

**Workshop Chair's Speech: Mobilization of Millimeter Wave and/or Optical Wave for Future Enormous Capacity Space Communication Infrastructure**

Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

14:15 - 14:40

**Future Perspective of Optical Satellite Networks**

Vincent Chan, *MIT, USA*

14:40 – 15:05

**Status of Laser Communication in Europe**

Zoran Sodnik, *ESA/ESTEC, The Netherlands*

15:05 - 15:30

**Status and Plan of Space Communication Program in Japan**

Takashi Jono, *JAXA, Japan*

15:30 - 15:50 *Coffee Break*

15:50 – 16:15

**Prospects for Improvement of Interplanetary Laser Communication Data Rate by 30 dB**

Hamid Hemmati, *JPL, USA*

16:15 - 16:40

**Mobile Optical Communication Projects at DLR and Prospects on Future Developments**

Dirk Giggenbach, *DLR, Germany*

16:40 - 17:05

**Lesson and Results from Gnd-OICETS Experiment and Following Activities on Optical Communications in Space**

Hiroo Kunimori, *NICT, Japan*

17:05- 17:40

**Free Discussions**

Moderator: Zoran Sodnik, *ESA/ESTEC, The Netherlands*

17:40 - 17:45

**Closing Remarks**

Naoto Kadowaki, *NICT, Japan*

Tuesday, September 25

09:00 - 10:15 - Room Basilica 1

Session 4: **Military and Dual Use Systems and Applications 1**

Chaired by: **Pietro Finocchio** *TELEDIFE, Italian Ministry of Defence, Italy*

K000005

**European Milsatcom Perspectives**

Silvio De Vita, *Thales Alenia Space Italia, Italy*  
Paolo Ricci, *SITAB Consortium, Italy*  
Marcello Spagnulo, *Finmeccanica, Italy*

K000093

**Italian Military and Dual use SATCOM system: an overview of SICRAL and ATHENA - FIDUS missions**

Giovanni Battista Durando, *TELEDIFE, Italian Ministry of Defence, Italy*  
Mario Cosmo, Enrico Russo, Antonio Sposito, *ASI, Italy*

K000048

**Design Methodology for High Capacity SATCOM Systems**

Mario A. Blanco, *The MITRE Corporation, USA*

K000088

**Broadband Dual Application: The Italian EHF/K Payload on FIDUS Program**

Francesca Finocchiaro, Alessandro Le Pera, Alessandro Pisano, *Thales Alenia Space, Italy*

K000090

**Athena Fidus a Ka/EHF band Satellite System for advanced Military and Civil applications**

Marco Brancati, Lorenzo Ronzitti, *Telespazio, Italy*  
Giuseppe Matarazzo, Francesco Zagami, *Thales Alenia Space, Italy*

09:00 - 10:15 - Room Basilica 2

Session 5: **Propagation**

Chaired by: **Aldo Paraboni**, *Politecnico di Milano, Italy*

K000043

**Goldstone Site Test Interferometer**

Roberto J. Acosta, James A. Nessel, *NASA Glenn Research Center, USA*  
Brian D. Frantz, *Verizon Federal Network System, USA*  
David D. Morabito, *Jet Propulsion Laboratory, USA*

K000049

**Overview of 3 Year Results of a Ka-band Earth-Satellite Propagation Campaign**

Armando Carlos Rocha, Rui Filipe Teixeira, *IT/DETI, University of Aveiro, Portugal*

K000098

**Project of a Large Data Collection of Multisite Real Time Attenuations in Ka Band Based on Skyplex Technology**

Mauro Buti, Stefano Bertorelli, Aldo Paraboni, *Politecnico di Milano, Italy*  
Luca Simone Ronga, Rosalba Suffritti, *CNIT - Università di Firenze, Italy*

K000014

**Dual Polarization Digital Satellite Beacon Detector for Propagation Experiments**

Armando Carlos Rocha, André Pires, Ricardo Sousa, *DETI/IT, University of Aveiro, Portugal*  
Rui Martins, *DETI/IEETA, University of Aveiro, Portugal*

K000042

**Goldstone Site Test Interferometer Phase Stability Analysis**

James A. Nessel, Roberto J. Acosta, *NASA Glenn Research Center, USA*  
David D. Morabito, *Jet Propulsion Laboratory, USA*

10:15 - 10:35 – Coffee Break

10:35 - 11:50 - Room Basilica 1

Session 6: **Galileo**

Chaired by: **Enrico Saggese**, *Finmeccanica, Italy*

K000114

**The New Roadmap of Galileo**

Tiziano Sassorossi, Cosimo La Rocca,  
*European Satellite Navigation Industries, Italy*

K000111

**Galileo: Design and Development of a  
Complex Navigation Satellite System**

Mauro Marinelli, Steven Bouchired, *European  
Satellite Navigation Industries, Italy*  
Veit Oehler, Ian Walters, *European Satellite  
Navigation Industries, Germany*

K000113

**Galileo Signal-in-Space: Present Status and  
Future Evolutions**

Monica Gotta, Salvatore Corvo, Giuseppe  
Esposito, Franco Gottifredi, Rosaria Barca,  
Sergio Piazza, Francesco Martinino, *Thales  
Alenia Space, Italy*

K000115

**Galileo System Verification Process**

Sergio Piazza, Monica Gotta, Roberto  
Campana, Mauro Leonardi, Francesco  
Martinino, *Thales Alenia Space, Italy*

K000116

**The Role of GIOVE Satellites in the GALILEO  
in-Orbit Validation**

Marco Falcone, Stefano Binda, *ESA, The  
Netherlands*  
Marc Gandara, Federico Giuntini, *European  
Satellite Navigation Industries, Italy*

10:35 - 11:50 - Room Basilica 2

Session 7: **Satellite Architectures 2**

Chaired by: **Alessandro Bellini**, *Telespazio, Italy*

K000035

**Satellite Telecommunications Advanced  
Networks for Global Monitoring Environment  
& Security**

Sophie Defever, Veronica Aznar-Abian, Laurent  
Bouscary, Bernard Laurent,  
*EADS Astrium, France*

K000082

**A Two-Way Interactive Broadband Satellite  
Architecture to Break the Digital Divide  
Barriers**

Gabriele Boccolini, Marco Luise, *University of  
Pisa, Italy*  
Benoit Garnier, Jean-Michel Merour, *Thales  
Alenia Space, France*  
Alexandre Brunelle, *EUTELSAT, France*  
Sabino Titomanlio, *MBI, Italy*  
Vittoria Mignone, *Centro Ricerche RAI, Italy*  
M. Angela Sasse, *University College London,  
United Kingdom*

K000089

**Architectural Solutions and Communication  
Link Design for a 2nd Generation Data Relay  
Systems**

Paolo Conforto, Giacinto Losquadro, Antonio  
Pandolfi, Aldo Sbardellati, Vincenzo Schena,  
Roberto Winkler, *Thales Alenia Space, Italy*  
Antonio Sposito, Lamberto Zuliani, *ASI, Italy*

K000103

**An Overview of the Italian Satellite  
Telecommunications and Audiovisual  
Market: Present Status and Future Trends**

Roberto De Martino, Giovanni Santella, *Autorità  
per le Garanzie nelle Comunicazioni (AGCOM),  
Italy*

K000105

**Uplink Capacity of Geo-Synchronous  
Satellite-based WCDMA Systems**

K. Sam Shanmugan, *University of Kansas, USA*  
John C. Thacker, *Lockheed Martin Space  
Systems, USA*

11:50 - 13:05- Room Basilica 1

Session 8: **Communication Protocols 1**

Chaired by: **Roberto Somma**, *Thales Alenia Space, Italy*

K000028

**Boosting Satellite Service Differentiation Using the Connection Control Protocol**

Fernando Vallejo, Ana Yun, *Thales Alenia Space Spain, Spain*  
Stéphane Combes, Domenico Mignolo, *ESA ESTEC, The Netherlands*

K000036

**A Markov-chain Model of the DVB-S2 Forward Link for Cross-Layer Analysis**

Simon Almstroem, Christian Kissling, Matteo Berioli, *German Aerospace Center (DLR), Germany*

K000031

**SATLIFE: Evolution of a Regenerative Satellite Network through multimedia services and applications**

Isaac Moreno, Ana Yun, Fernando Vallejo, Elisa Callejo, *Thales Alenia Space Spain, Spain*  
Jose Alfonso Torrijos, Roberto Giménez Molina, *Telefonica Investigación y Desarrollo, Spain*  
Jose Antonio Guerra, Miriam Catalán, *Hispasat S.A., Spain*

K000112

**DVB-RCS: Revitalizing the Open Standard for Mobile Applications**

Harald Skinnemoen, *AnsuR Technologies, Norway*

K000039

**A Novel Proposal of TCP Protocol based on Bandwidth Estimation over Satellite Networks**

Floriano De Rango, Mauro Tropea, Antonio F. Gentile, Attilio Provenzano, Salvatore Marano, *DEIS - University of Calabria, Italy*

11:50 - 13:05 - Room Basilica 2

Session 9: **Advances in Components 1**

Chaired by: **Naoto Kadowaki**, *NICT - National Institute of Information and Communications Technology, Japan*

K000009

**Ka-band Dual Conversion Receiver for Satellite**

Toshiyuki Murakami, Masanobu Kojima, Shinji Suzuki, Ryo Koyama, *NEC TOSHIBA Space Systems, Japan*

K000016

**Advances in Ka/Q Band Linearization**

Robert Jay Gray, *Linearizer Technology, USA*  
Allen Katz, Roger Dorval, *College of New Jersey, USA*

K000017

**Fine Grain Network Traffic Monitoring Tool**

Erling Kristiansen, *ESA, The Netherlands*  
Thomas Grootaers, *Ubizen AETHIS, Belgium*

K000004

**The Architecture of a Software Radio DVB-S2 Receiver**

Panayiotis Savvopoulos, Nikolaos Papandreou, Theodore Antonakopoulos, *University of Patras, Greece*

K000099

**The Use of DVB-S2 Variable Coding and Modulation to Increase Downlink Throughput for Remote Sensing Satellites**

Richard T. Gedney, *Efficient Channel Coding (ECC), USA*

13:05 - 14:30 – Lunch

14:30 - 16:15 - Room Basilica 1

Session 10: **Mobile Broadband Services**

Chaired by: **Marco Lisi**, *Telespazio, Italy*

K000072

**A mobile multimedia satellite system reusing existing satellites**

Rolv Midthassel, Harald Ernst, *ESA ESTEC, The Netherlands*

K000117

**Proactive Retransmission Scheme for Mobile DVB-RCS**

Gennaro Gallinaro, Daniele Lo Forti, *Space Engineering, Italy*

Alberto Ginesi, Catherine Morlet, *ESA, The Netherlands*

K000003

**Polarization Tracking Free Broadband Mobile Satellite Communication System**

Fumihiko Yamashita, Junich Abe, Kiyoshi Kobayashi, Kohei Ohata, *NTT, Japan*  
Kiyotake Ando, *JSAT, Japan*

K000041

**WWLAN Satellite Gap-Filler System: an Effective Solution to Extend Satellite Coverage in the Railway Tunnels for the Internet on Trains - Prototype Design, Implementation and Test Campaign Results**

Vincenzo Schena, Fabrizio Ceprani, Guglielmo Lulli, *Thales Alenia Space Italia, Italy*  
Alessia Marcucci, *Sofiter System Engineering, Italy*

K000065

**The Role of Satellite in Broadband Wireless Access for Public Protection, Disaster Relief and GMES Missions**

Jean-Didier Gayraud, Isabelle Buret, *Thales Alenia Space, France*  
Ana Bolea Alamanac, *ESA, The Netherlands*

K000044

**MMPLS in Mobile Ad-hoc network 802.11**

Jesus Hamilton Ortiz, Juan Carlos Lopez, *University of Castilla y la Mancha, Spain*  
Carlos Lucero, *University of Cauca, Colombia*

K000107

**Broadband Requirements in GNSS Applications**

Giorgio Manzoni, Giorgio Bolzon, Davide Gherdevich, Raffaella G. Rizzo, Tatiana Sluga, *GEONETLAB, Università di Trieste, Italy*

14:45 - 16:15- Room Basilica 2

Session 11: **Antenna Systems**

Chaired by: **Roberto J. Acosta**, *NASA Glenn Research Center, USA*

K000034

**Ku-Band T/R Flat Antenna with Polarization Adjustment**

Lino Russo, Alfredo Catalani, Franco Di Paolo, Marzia Migliorelli, *Space Engineering, Italy*

K000080

**Next Generation High Capacity Ka-Band Satellite Systems**

Peter Hadinger, Hau Ho, Alan Cherrette, *Northrop Grumman Space Technology, USA*

K000063

**Ka Carbon Fiber Antenna for Ka Band**

Piero Ruspicioni, Pasquale Cerrito, Alessandro Noro, Alfonso Ridolfi, *Aersat, Italy*

K000055

**Development of Ka Band Multi-Beam Antenna**

Jang-Sup Choi, Yong-Deuk Lee, Seong-Pal Lee, *ETRI, South Korea*

K000084

**Ka-Band on the Move Broadband Communications**

Maurizio Tripodi, Tindaro Cadilli, Ignazio Pomona, Francesco Di Maggio, Antonino Incorvaia, Carmelo Mollura, *Selex-Communications, Italy*

K000108

**Proto-Flight Model Development of the Ka-Band Multi-Beam Active Phased Array Antenna for Winds**

Sumire Takatsu, Shiro Kitao, Yoshihiko Konishi, *Mitsubishi Electric Corp., Japan*  
Masanobu Yajima, Tomonori Kuroda, Masaaki Shimada, *JAXA, Japan*

16:15 - 16:45 – Coffee Break

16:45- 18:15 - Room Basilica 1

Session 12: **Interplanetary Communications**  
Chaired by: **Wallace D. Williams**, *NASA Glenn Research Center, USA*

K000002

**Interplanetary Spacecraft Navigation Using Ka-band Radiometric Observables**

David D. Morabito, Eric J. Graat,  
James S. Border, Shervin Shambayati,  
*Jet Propulsion Laboratory/Caltech, USA*

K000078

**Custodial Transfer Versus Erasure Coding in Delay Tolerant Interplanetary Networks**

Tomaso de Cola, *CNIT - University of Genoa, Italy*  
Mario Marchese, *University of Genoa, Italy*

K000054

**Assessment of Ka-Band Antenna Beam Steerable Technologies for NASA Space Communications**

Felix A. Miranda, Richard Q. Lee, *NASA Glenn Research Center, USA*

K000046

**Dynamic Routing over Interplanetary Networks Based on DTN Approach and on the Link Failures Prediction**

Floriano De Rango, Giovanni Battista Laratta,  
Mauro Tropea, Salvatore Marano, *DEIS - University of Calabria, Italy*  
Giuseppe Codispoti, *ASI, Italy*

K000100

**The Earth Based Ground Stations Element of the Lunar Program**

Jonathan Gal-Edd, *GSFC/NASA, USA*  
Curtis Fatig, *GSFC/SAIC/NASA, USA*  
James Schier, *NASA Headquarters, USA*  
Charles Lee, *California State University, USA*

Oral presentation on

**Evolution of the Lunar Network**

by Jonathan Gal-Edd, *GSFC/NASA, USA*

16:45 - 18:00 - Room Basilica 2

Session 13: **Advances in Components 2**  
Chaired by: **Antonio Vernucci**, *Space Engineering, Italy*

K000021

**Development of Ka-Band Miniature Low Noise Amplifier**

Kazutoshi Takahashi, Eiji Inomata, Yukiko Sato,  
Masahiro Funabashi,  
Takafumi Hirano, *NEC TOSHIBA Space Systems, Japan*

K000023

**Multipoint Amplifiers for Ka-band Multi-beam Payloads with Amplitude/Phase Compensation**

Alan Couchman, Daryl Jones, *EADS Astrium, United Kingdom*

K000038

**Storage to Conquer Space & Time**

Ray Sperber, Bruno Perrot, *SES-ASTRA, Luxembourg*

K000064

**Ka Band Transceiver**

Davide Marletta, Vita Piero, Rosario Licitra,  
Concetto Squadrito, Fabio Burgarello, *Antech, Italy*

K000056

**A World Class Ku Band Down-Converter Equipment for Use in a Satellite Payloads**

Simon Rumer, Neil Faulkner, *EADS Astrium, United Kingdom*

Wednesday, September 26

09:00 - 10:15 - Room Basilica 1

Session 14: **Military and Dual Use Systems and Applications 2**

Chaired by: **Tom Butash**, *BAE Systems, USA*

K000094

**“Dual Use” Approach to the Observation and Navigation Satellite Systems**

Dario Coppola, *TELEDIFE, Italian Ministry of Defence, Italy*

K000068

**A Satellite and Avionic Systems Network Centric Architecture for Dual Use Crisis Management**

Giuseppe Tomasicchio, Vincenzo Schena, Roberto Winkler, *Thales Alenia Space Italia, Italy*

K000092

**ATHENA-FIDUS Dual Use Satellite System: Italian Mission Architecture, Sizing and Performance**

Fabrizio Di Cola, Giacinto Losquadro, Aldo Sbardellati, Roberto Winkler, *Thales Alenia Space Italia, Italy*

K000083

**Security Certification of Dual Use Satellite Systems**

Marco Lisi, *Telespazio, Italy*

K000091

**The Evolving Italian SatCom Infrastructure Supporting Network Centric Operations**

Giacinto Losquadro, Domenico Capolupo, Aldo Sbardellati, Roberto Winkler, *Thales Alenia Space, Italy*

09:00 - 10:15 - Room Basilica 2

Session 15: **Communication Protocols 2**

Chaired by: **Nafiz Karabudak**, *Lockheed Martin Corporation, USA*

K000073

**Dynamic Bandwidth Allocation over Satellite Channels: Definitions, Implementation Issues and Performance Study**

Igor Bisio, Mario Marchese, *DIST - University of Genoa, Italy*

K000095

**Toward a Complete Control Framework For Adaptive Capacity Allocation In Mobile DVB-RCS**

Franco Davoli, *DIST - University of Genoa and CNIT, Italy*

Nedo Celandroni, Erina Ferro, Alberto Gotta, Raffaello Secchi, *ISTI-CNR, Italy*

K000051

**Experiments of Software Based VPN Connections over Satellite Networks**

Ken Umeno, *NICT, Japan*

Mitsuyoshi Iida, *ARIB, Japan*

Hideaki Terai, *ChaosWare, Japan*

Minghui Kao, *The Institute of Physical and Chemical Research, Japan*

Tharadol Komolmis, *Chiang Mai University, Thailand*

Joko Suryana, Sastrokusumo Utro, *ITB, Indonesia*

Tri Wahyu Murni, *HSGH, Indonesia*

K000096

**On Accessing Remote Laboratory Facilities Within a Grid-Based Infrastructure Via Ka Satellite Links**

Luca Berruti, Franco Davoli, Mirko Polizzi, Stefano Vignola, Sandro Zappatore, *CNIT - University of Genoa Research Unit, Italy*

K000045

**QoS Multicast Routing Protocol for Broadband Hierarchical Networks**

Floriano De Rango, Amilcare Franco

Santamaria, Mauro Tropea, Gabriel Milanese,

Salvatore Marano, *DEIS - University of Calabria, Italy*

10:15 - 10:30 – Coffee Break

10:45 - 12:00 - Room Basilica 1

Session 16: **Satellite-Aided Navigation and Related Applications 2**

Chaired by: **Carlo Elia**, *ESA, The Netherlands*

K000047

**On the Dilution of Precision Factor for Medium Earth Orbit Search and Rescue Satellite Systems**

Mario Caron, Xiaobin Tang, Richard Paiement, *Communications Research Centre Canada, Canada*

K000058

**Optimum Frequency Satellite Navigation Systems**

Paul Christopher, *PFC Associates, USA*

K000059

**Key Issues in Orbit Determination of GPS Satellites with Laser Retroreflectors from a Network of Laser Ranging Ground Stations**

James Miller, John LaBrecque, *NASA Headquarters, USA*  
Robert Nelson, *Satellite Engineering Research Corporation, USA*  
Beryl Brodsky, A.J. Oria, *Overlook Systems Technologies, USA*  
Bryan Welch, *NASA Glenn Research Center, USA*

K000076

**NEWSKY - Networking the Sky for Aeronautical Communications**

Frank Schreckenbach, Michael Schnell, Sandro Scalise, Christian Kissling, *German Aerospace Center (DLR), Germany*

K000060

**Key Issues in NASA's Solar System Wide Architecture for Timekeeping and Time Dissemination**

James J. Miller, Al Gifford, *NASA Headquarters, USA*  
Robert A. Nelson, *Satellite Engineering Research Corporation, USA*  
Beryl Brodsky, A.J. Oria, *Overlook Systems Technologies, USA*  
Richard S. Orr, *SATEL, LLC, USA*  
Bryan Welch, *NASA Glenn Research Center, USA*  
Larry Felton, Lee Pitts, Frank VanLandingham, *Computer Sciences Corporation, USA*

10:30 - 12:00 - Room Basilica 2

Session 17: **Fade Mitigation**

Chaired by: **Jean-Christophe Cayrou**, *Thales Alenia Space, France*

K000007

**Effect of Rain Attenuation Compensation Technique for 21GHz Broadcasting Satellite System**

Susumu Nakazawa, Shoji Tanaka, Kazuyoshi Shogen, *NHK Science & Technical Research Laboratories, Japan*

K000033

**Performance Assessment of a Multibeam Power-Pooling Satellite System Implementing Interference and Fade Mitigation Techniques**

Piero Angeletti, Ana Bolea Alamanac, *ESA, The Netherlands*  
Michel Bousquet, *SUPAERO, France*  
Marco Lisi, *Telespazio, Italy*

K000040

**Degradation Level Based DTMC Channel Model for DVB-RCS Satellite System**

Floriano De Rango, Fiore Veltri, Antonio Gentile, Salvatore Marano, *DEIS - University of Calabria, Italy*

K000087

**Forthcoming Advanced Experiments: The Multipurpose Q/V Band Payload On The Alphasat Program**

Alessandro Pisano, Vincenzo Marziale, *Thales Alenia Space, Italy*  
Victor Speciale, *Space Engineering, Italy*

K000101

**Performance of a Reconfigurable Satellite Antenna Front-End as a Countermeasure Against Tropospheric Attenuation**

Aldo Paraboni, Carlo Capsoni, Mauro Buti, Stefano Bertorelli, *Politecnico di Milano, Italy*  
Piero Gabellini, Nicola Gatti, *Space Engineering, Italy*  
Antonio Martellucci, Peter Rinous, *ESA-ESTEC, The Netherlands*

K000079

**Site Test Interferometer Atmospheric Decorrelation Statistics Use in Uplink Array Link Budgets**

David D. Morabito, Larry R. D'Addario, *Jet Propulsion Laboratory/Caltech, USA*

12:00 - 13:15 - Room Basilica 1

Session 18: **Broadband Systems 2**

Chaired by: **Arduino Patacchini**, *Skylogic, Italy*

K000061

**Reliability Analysis of the Ka band Communication Payload System (COPS)**

Cheol-Oh Jeong, Seong-Pal Lee, *ETRI, South Korea*

K000104

**Ka-band Satellite Communications: a Service Provider Viewpoint**

Antonio Ceccarelli, Marco Lisi, Silvio Pellegrini, *Telespazio, Italy*

K000109

**Ka Band Cascade Cx Payload**

Jaafar Sidi Cherkaoui, Mark Wlodyka, *MacDonald, Dettwiler & Associates (MDA), Canada*

K000057

**Laser Communication Comparisons for Earth Observation Satellites 2, 3, and 10 Micron Relations**

Paul Christopher, *PFC Associates, USA*

K000015

**Optical Telecommunications Payload: the Italian Way**

Lamberto Zuliani, Valeria Catalano, *ASI, Italy*  
Luciana Bonino, *Thales Alenia Space, Italy*  
Valter Ferrero, Ramon Mata Calvo, *PhotonLab, Politecnico di Torino, Italy*

12:00 - 13:15 - Room Basilica 2

Session 19: **Advances in Components 3**

Chaired by: **Bruno Perrot**, *SES GLOBAL, Luxembourg*

K000067

**A Modular S-Ka Upconverter with ALC For Space Application**

Shabbir S. Moochalla, Scott A. Iepson, Thu Hoang, *Lockheed Martin Commercial Space Systems, USA*

K000075

**Engineering Flight Model Development of Onboard Software Defined Radio System for Japanese Small Test Satellite**

Nozomu Nishinaga, Kenji Suzuki, Eihisa Morikawa, *NICT, Japan*  
Masayoshi Yoneda, *NTSpace Systems, Japan*

K000097

**Overview on ESA-TLC Integrated Applications Projects for Capacity Building in Emerging Countries Combining Satcom and Earth Observation**

Bernhard Collini-Nocker, *GCS, Austria*  
Stefano Badessi, *ESA/ESRIN, Italy*  
Davide Tomassini, Marco Bertinaria, *Vitrociset, Italy*  
Marco Cosentino, *Vitrociset P.E.N., The Netherlands*

K000086

**Ultra Low Phase Noise High Performance Dual-Use Ka-Band Block Upconverter**

John C. Odell, Craig Rogers, *Herley-CTI, USA*

K000008

**Comparative Performance Analysis of Symbol Timing Recovery for DVB-S2 Receivers**

Panayiotis Savvopoulos, Theodore Antonakopoulos, *University of Patras, Greece*

13:15 - 13:25 - Room Basilica 1

**Closing Session**

**Closing Remarks**

Frank Gargione, *Satellite Systems Consultant, USA*  
Franco Marconicchio, *ASI, Italy*

13:25 - 14:30 – Lunch

## GENERAL INFORMATION

### Venue

The 13<sup>th</sup> Ka and Broadband Communications Conference and the 5<sup>th</sup> BroadSky Workshop are held at the NH Hotel Santo Stefano in Turin (Italy), corso di Porta Palatina 19, phone +39 011 5223311, fax +39 011 5223313.

### 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.

### Help Desk

Should you encounter any problems or have any questions during the Conference, please visit the Registration Desk and someone from the Conference Staff will try to assist you.

### 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 Reception on Monday and the Conference Dinner on Tuesday 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.

### Messages and Information

Messages will be recorded and posted on a bulletin board in the registration area. It is not possible to page conference attendees.

### Internet Access during Conference

WiFi internet access is possible in every room and in any public space of the Hotel, free of charges.

### Liability and Insurance

Neither the Conference Organizers, nor the NH Hotel Santo Stefano 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 TOUR

### Thales Alenia Space Plant & Civil Protection Centre

*Wednesday, September 26, 15:00 – 17:30*

After the closing session of the Conference **Thales Alenia Space** is pleased to offer a tour of its facilities in Turin. The tour continues at the Civil Protection Control Room of Regione Piemonte (located in ALTEC), kindly provided by **Telespazio**.

**Anyone interested in the plant tour can make reservations applying directly at the Conference Registration Desk by noon on Tuesday, September 25.**

Please be aware that the tour has a limited number of participants (50). Reservations will be accepted on a “first-come first-served” basis. A second tour will be offered on Thursday morning, September 27, if there is enough demand.

Bus transportation will be provided from the Conference site.

## SOCIAL EVENTS

### Welcome Cocktail Reception

*Monday, September 24, 19:30 – 21:30*

**Private Visit of the Egyptian Museum and Welcome Cocktail Reception at the Mole Antonelliana.**

In keeping with our tradition of showcasing the best that the city hosting the conference has to offer, the Welcome Cocktail this year will feature two important attractions, both a short walk from the conference hotel.

The first is the Egyptian Museum, formally founded in 1824, the only museum other than the Cairo Museum dedicated solely to Egyptian art and culture.

The collections of the Museum were enlarged as a result of the excavations conducted by the Museum's archaeological mission between 1900 and 1935 (a period when finds were divided between the excavators and Egypt). The Museum is closed on Mondays, but a private guided tour has been arranged for the conference attendees before the cocktail reception.

The second attraction is the Mole Antonelliana, the symbol of Turin. The building's massive, classical base contrasts with the tall tower that soars to a height of 167.50 meters, until a few years ago the highest stone building in Europe.

The Mole, designed by the Architect Alessandro Antonelli, was started in 1863 as a Jewish Synagogue, later housed the Museo del Risorgimento, and now it hosts the National Museum of Cinema.

The Welcome Cocktail Reception will take place at the ground floor of the Mole Antonelliana. In addition to the cocktails and hors d'oeuvres, guests can enjoy a breathtaking view of the city from the tower's observation deck, 85 meters high, reached by a glass elevator in the center of the tower.

***The Welcome Cocktail Reception is kindly sponsored by Thales Alenia Space Italia, a Thales / Finmeccanica Company.***

### Conference Dinner at Restaurant “Il Ciacolon”

*Tuesday, September 25, 20:00 – 24:00*

The Conference Dinner will be held at the Restaurant ‘**Il Ciacolon**’, a Turin institution that for the last thirty-four years has catered to all types of customers: politicians, football players, actors, and a surprising number of painters, whose presence is felt by the dozens of paintings lining the walls.

Bus transportation will be provided from the Conference Site.

***The Conference Dinner is kindly sponsored by Telespazio, a Finmeccanica / Thales Company.***

## REGISTRATION INFORMATION

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

- on Monday, September 24 from 8:00 to 17:30,
- and the following days during the Conference hours.

All payments must be in Euro. Registration fees are inclusive of Italian VAT (20%).  
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 and Social events.

### Registration fees

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**Conference Fee before July 23, 2007: Euro 750    after July 23, 2007: Euro 900**

Included in the Conference registration fee are:

- Access to the technical sessions,
- Access to 5th BroadSky Workshop,
- Proceedings of the Conference (printed book),
- CD ROM of the Conference Proceedings,
- 5th BroadSky Workshop presentations booklet,
- Coffee breaks (Monday, Tuesday, Wednesday, September 24, 25, 26),
- Lunches (Monday, Tuesday, Wednesday, September 24, 25, 26),
- Private Visit of the Egyptian Museum and Turin guided Tour on Monday, September 24,
- Welcome Cocktail Reception on Monday, September 24,
- Conference Dinner on Tuesday, September 25,
- Plant tour on Wednesday, September 26.

### Additional Options

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*(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

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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.