

## WELCOME

*The Steering and Organizing Committee welcomes you to the 12<sup>th</sup> Ka and Broadband Communications Conference in Naples. We hope you will find this conference an enlightening and pleasant experience.*



## CONFERENCE SCOPE

The demand for communications satellites continues to appear stable, with some new starts and expected orders for replacements of the aging satellites launched in the nineties, but the future may see an increase in demand.

This seems likely due to the growth of the Directway subscriber base, the launch of service by Wildblue, the launch of IpStar, Wild Blue 1, the military Wideband Gapfiller, and the US mandate to convert to High Definition Television broadcasts. These services will benefit from expected lower cost and higher functionality of new ground terminals featuring significant improvements in coding, higher order modulation, creation of IP networks with QoS for both Star and Mesh topologies, and higher levels of integration.

Several new applications geared to mobility are creating new markets for which satellites are uniquely qualified, and presage a new era of broadband services to aircraft, such as the internet services offered by Connexion by Boeing and the live television broadcasts by Directv.

The advent of the Galileo project is expected to provide the impetus for a new look at satellite-aided navigation and related communications to improve the management of aircraft in flight, to reduce congestion and to increase the efficiency of travel by using the most direct route.

Refinements in propagation modeling, real time weather information for fade mitigation, and efforts on architectures and protocols offer novel approaches to better utilize the available spectrum and maximize satellite throughput.

In view of the above developments, the Ka and Broadband Conference has solicited papers that highlight broadband and mobile communications, satellite-aided navigation, and the traditional applications in Ka Band for the following sessions:

- Satellite-Aided Navigation
- Mobile Broadband Services
- New and Updated Ka Band Flight Systems
- Military Application and Systems
- Ka Band Ground Systems
- Advances in Ka Band Components
- Experimental Ka Band Results
- Satellite Architectures
- Communications Protocols
- Ka Band Propagation and Fade Mitigation
- Marketing
- Regulatory Issues

# COMMITTEES

## General Chair

**Frank Gargione**, *Satellite Systems Consultant, USA*

## Steering & Organizing Committee

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**Franco Marconicchio** (Co-Chair), *ASI - Agenzia Spaziale Italiana, Italy*

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

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**Giovanni E. Corazza** - *Università di Bologna, Italy*

**Carlo Elia** - *ESA - European Space Agency, The Netherlands*

**Barry G. Evans** - *University of Surrey, United Kingdom*

**Richard T. Gedney** - *ECC - Efficient Channel Coding, USA*

**Naoto Kadowaki** - *ATR - Adaptive Communications Research Laboratories, Japan*

**Cosimo La Rocca** - *Galileo Industries, Italy*

**Pietro Lo Galbo** - *ESA - European Space Agency, The Netherlands*

**Douglas V. McKinnon** - *Lockheed Martin Commercial Space Systems, USA*

**Bruno Perrot** - *SES GLOBAL, Luxembourg*

**Enrico Saggese** - *Finmeccanica, Italy*

**Roberto Viola** - *AGCOM – Autorità per le Garanzie nelle Comunicazioni, Italy*

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

## THE FOURTH BROADSKY WORKSHOP

Main Topic: **Overview of Satellite Link Propagation Study and Positioning Experiments in Japan**

The 4th BroadSky Workshop focuses on introducing Japanese activities which are not presented often in recent workshops or conferences. Firstly, Ka-band propagation study in Japan is introduced. Japan has a long history of using Ka-band satellite communications since 1970's and propagation study has been done since then.

The second topic is **Satellite Based Positioning and Navigation Experiment Planned in ETS-VIII and QZSS Projects.**

The Workshop is organized by

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

**YRP** – Yokosuka Research Park, Japan

### Workshop Moderator

**Naoto Kadowaki**

*ATR - Adaptive Communications Research Laboratories, Japan*

email: [naoto@atr.jp](mailto:naoto@atr.jp)

## ORGANIZING SECRETARIAT

**Clotilde Canepa Fertini**

*IIC - Istituto Internazionale delle Comunicazioni, Italy*

email: [clotilde.fertini@kaconf.org](mailto:clotilde.fertini@kaconf.org)

**Kaji Foscoli**

*IIC - Istituto Internazionale delle Comunicazioni, Italy*

email: [kaji.foscoli@kaconf.org](mailto:kaji.foscoli@kaconf.org)

WEB SITE <http://www.kaconf.org>

## ACKNOWLEDGMENTS

### 12th Ka and Broadband Communications Conference

organized by

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

under the auspices of

**ASI** – Agenzia Spaziale Italiana, Italy

**CRC** – Communications Research Centre, Canada

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

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

**NASA** – National Aeronautics & Space Administration, USA

with the support of

**CCIAA** – Camera di Commercio Industria Artigianato ed Agricoltura di Napoli  
(Chamber of Commerce of Naples), Italy

**Comune di Napoli** (City of Naples), Italy

and sponsored by

**Alcatel Alenia Space**, Italy

**CPI Satcom**, USA

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

**Finmeccanica**, Italy

**Galileo Industries**, Germany

**MARS**, Italy

**Space Engineering**, Italy

**Telespazio**, Italy

with the technical support of

**CNIT** – Consorzio Nazionale Interuniversitario per le Telecomunicazioni, Laboratorio Nazionale di Comunicazioni Multimediali, Napoli, Italy

**DIET** – Dipartimento di Ingegneria Elettronica e delle Telecomunicazioni, Università degli Studi di Napoli Federico II, Italy

## PROGRAM OVERVIEW

Wednesday 27 September

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08:00 – 09:00	<i>Registration</i>
09:00 – 09:30	<b>Opening</b>
09:30 – 10:45	<b>Session 1: Navigation 1</b> (Room Ferdinando I)
10:45 – 11:15	<i>Coffee Break</i>
11:15 – 12:45	<b>Session 2: Galileo</b> (Room Ferdinando I)
12:45 – 14:30	<i>Lunch</i>
14:30 – 16:00	<b>Session 3: Ground Systems 1</b> (Room Ferdinando I) <b>Session 4: Architectures 1</b> (Room Ferdinando II)
16:00 – 16:30	<i>Coffee Break</i>
16:30 – 18:30	<b>Session 5: Advances in Components 1</b> (Room Ferdinando I) <b>Session 6: Interplanetary Communications 1</b> (Room Ferdinando II)
19:30 – 21:30	<i>Visit and Welcome Cocktail at Palazzo delle Arti di Napoli (PAN)</i>

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Thursday 28 September

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08:30 – 09:30	<b>Session 7: Interplanetary Communications 2</b> (Room Ferdinando I) <b>Session 8: Communications Protocols 1</b> (Room Ferdinando II)
09:30 – 10:30	<b>Session 9: Ground Systems 2</b> (Room Ferdinando I) <b>Session 10: Propagation and Fade Mitigation 1</b> (Room Ferdinando II)
10:30 – 11:00	<i>Coffee Break</i>
11:00 – 13:00	<b>Session 11: Antennas</b> (Room Ferdinando I) <b>Session 12: Architectures 2</b> (Room Ferdinando II)
13:00 – 14:30	<i>Lunch</i>
14:30 – 16:00	<b>Session 13: Advances in Components 2</b> (Room Ferdinando I) <b>Session 14: Communication Protocols 2</b> (Room Ferdinando II)
16:00 – 16:30	<i>Coffee Break</i>
16:30 – 17:30	<b>Session 15: Navigation 2</b> (Room Ferdinando I) <b>Session 16: Architectures 3</b> (Room Ferdinando II)
20:00 – 24:00	<i>Conference Dinner at Rocca Matilde in Posillipo</i>

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Friday 29 September

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09:00 – 10:00	<b>Session 17: New Systems</b> (Room Ferdinando I) <b>Session 18: Communications Protocols 3</b> (Room Ferdinando II)
10:00 – 10:30	<i>Coffee Break</i>
10:30 – 12:15	<b>Session 19: Mobile Broadband Services</b> (Room Ferdinando I) <b>Session 20: Propagation and Fade Mitigation 2</b> (Room Ferdinando II)
12:15 – 13:00	<b>Closing Session</b> (Room Ferdinando I)
13:00 – 14:30	<i>Lunch</i>
14:30 – 17:20	<b>Fourth Broadsky Workshop</b> (Room Ferdinando I)

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# PROGRAM

Wednesday, 27 September

08:00 - 09:00 – Registration Desk

## Registration

09:00 - 09:30 - Room Ferdinando I

## Opening Session

Opening Remarks:

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

Welcome by the Naples City Authorities representatives

Francesco Carassa's Eulogy by Aldo Paraboni, *Politecnico di Milano, Italy*

09:30 - 10:45 - Room Ferdinando I

## Session 1: Navigation 1

Chaired by: **C. LA ROCCA**, *Galileo Industries, Italy*

**Invited Speech** by:

Giuseppe Veredice, *CEO, Telespazio, Italy*

K000008

### **Assessing the Near-Term Application of Satellite Systems to Aviation Safety Communications**

Robert J. Kerczewski, *NASA Glenn Research Center, USA*

K000038

### **Business Models and Billing for Integrated Satellite and Terrestrial Air Traffic Management Systems**

Massimo De Sanctis, *PlaneBill, Italy*

Markus Werner, *TriaGnoSys, Germany*

K000013

### **On Medium Earth Orbit Search and Rescue System Performance - A Canadian Perspective**

Mario Caron, Jim King, *Communications Research Centre Canada, Canada*

K000010

### **Evaluation of VDL2 for En Route Implementation in the U.S. Air Space**

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

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

10:45 - 11:15 – Coffee Break

11:15 - 12:45 - Room Ferdinando I

**Session 2: Galileo**

Chaired by: **E. SAGGESE**, *Finmeccanica, Italy*

**Invited Speech by:**

Giuseppe Viriglio, *Director of EU and Industry Programs, ESA, The Netherlands*

K000081

**The Galileo System Architecture**

Lucio Castellano, Steven Bouchired, Mauro Marinelli, *Galileo Industries, Italy*  
Ian Walters, *Galileo Industries, Germany*

K000107

**The Phases of the Galileo Program**

Cosimo Larocca, Tiziano Sassorossi, *Galileo Industries, Italy*  
Alexander Mager, *Galileo Industries, Germany*

K000108

**The Galileo Program: Business Case and Applications**

Cosimo Larocca, Tiziano Sassorossi, *Galileo Industries, Italy*  
Alexander Mager, *Galileo Industries, Germany*

K000109

**The Galileo In-Orbit Validation Program**

Riccardo Dellago, Mauro Marinelli, *Galileo Industries, Italy*  
Edward Breeuwer, *ESA, The Netherlands*

K000110

**The Galileo Test User Segment**

Sergio Di Girolamo, Mauro Marinelli, Francesco Luongo, *Galileo Industries, Italy*  
Martin Hollreiser, Juan Carlos De Mateo, Richard Morgan Owen, *ESA-ESTEC, The Netherlands*

12:45 - 14:30 – Lunch

14:30 - 15:30 - Room Ferdinando I

**Session 3: Ground Systems 1**

Chaired by: **M. CARON**, *Communications Research Centre Canada, Canada*

K000069

**High Speed Turbo Decoder for WINDS Burst Modem**

Richard T. Gedney, Mike Dollard, Sameep Dave, *Efficient Channel Coding (ECC), USA*  
Yukio Hashimoto, Takashi Takahashi, Naoko Yoshimura, Ryutaro Suzuki, *National Institute of Information and Communications Technology (NICT), Japan*

K000102

**Next Generation Broadband Satellite Platform Supporting DVB-S2 Standard**

Mario Mancini, *Hughes, Italy*

K000005

**Satellite Channel Emulator Implemented on a Software Radio Platform**

Wolfgang Kogler, Andreas Brutti, *Graz University of Technology, Austria*  
Otto Koudelka, Michael Schmidt, *Joanneum Research, Graz University of Technology, Austria*

K000117

**Complementing ESA Ground Networks With Satellite Communications For The Implementation The Decentralized Approach To Space Operations**

Stefano Tempesta, Raimondo Fortezza, Carlo Albanese, *MARS, Italy*

14:30 - 16:00 - Room Ferdinando II

**Session 4: Architectures 1**

Chaired by: **J-C. CAYROU**, *Alcatel Alenia Space, France*

K000046

**SATCOM Architecture for IP Networks**

Alexander C. Bartko, Kenneth Y. Jo, *Defense Information Systems Agency, USA*

K000002

**Large Flexible Payloads for the Post-2012 Generation of Broadband Satellites**

Jean-Didier Gayraud, Katia Leconte, Isabelle Buret, *Alcatel Alenia Space, France*  
Oscar del Rio Herrero, *ESA-ESTEC, The Netherlands*

K000009

**Ka-Band Implications on Evolution of NASA's Near-Earth Tracking and Data Relay Satellite System**

Roger J. Flaherty, Frank J. Stocklin, Armen Caroglanian, *NASA/GSFC, USA*  
Aaron Weinberg, *ITT Industries, USA*

K000062

**Market Needs and Architecture Roadmap for Next Generation Broadband Satellite Systems**

Isabelle Buret, *Alcatel Alenia Space, France*  
Bruno Perrot, *SES GLOBAL, Luxembourg*

K000041

**The Role of Ka-Band Satellite Communications in "Systems of Systems" for the Provision of Value Added Services**

Marco Lisi, *Telespazio, Italy*

K000064

**Communications Subsystem Mass Minimization for the Transmit and Receive Terminals in a Space-to-Space Link**

Richard S. Orr, *SATEL, USA*

16:00 - 16:30 – Coffee Break

16:30 - 18:30 - Room Ferdinando 1

**Session 5: Advances in Components 1**

Chaired by: **N. KADOWAKI**, *ATR, Japan*

K000113

**A Compact Lightweight 50 W Ka-Band Solid-State Power Amplifier for Satellite Communication Systems**

Heidi Thelander, Michael Delisio, Keith King, *Wavestream, USA*

K000006

**Very Integrated Low Noise Amplifiers Based on Chip on Board Technology for Ka-Band Multimedia Applications**

Philippe Monfraix, Régis Barbaste, Olivier Bosch, Laurent Garcia, Olivier Havard, Jean-Christophe Cayrou, Claude Drevon, Jean-Louis Cazaux, *Alcatel Alenia Space, France*

K000007

**Ka-Band Compensation Unit for In-Orbit Output Power Adjustable MPM**

Messiah Khillia, Hartmut Schreiber, Walter Gross, *TESAT Spacecom, German*

K000033

**Miniaturized Ka-Band Downconverter**

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

K000045

**High Isolation and High Speed 4x4 Microwave Switch Matrix for the COMS Ka-Band Communication Payload**

Inkwon Ju, Jin-Ho Jo, In-Bok Yom, *ETRI, South Korea*

K000052

**Ka-Band Communications System Phase Noise, Spurious, and Transient Effects**

Lama Dayaratna, Lisa Ramos, Paul Rawicz, Alex Bogorad, Samuel Valenti, *Lockheed Martin Commercial Space Systems, USA*

K000114

**Antenna Feed Mounted Ka-Band Redundant Low Noise Amplifier**

James E. Bowe, Samuel R. Valenti, *Lockheed Martin Commercial Space Systems, USA*

K000121

**Dual-Use High-Performance Ka-Band Up-Converter**

Marcelo Garzon, Sasha Barbu, Shan Liang, Ilya Tchaplina, *ITS Electronics, Canada*

16:30 - 18:00 - Room Ferdinando II

**Session 6: Interplanetary Communication 1**

Chaired by: **W. D. WILLIAMS**, *NASA Glenn Research Center, USA*

K000080

**High Capacity Communications from Martian Distances Part 1: Spacecraft Design and Link Analysis**

Hemali N. Vyas, Richard Hodges, Gary Noreen, *NASA - Jet Propulsion Laboratory, USA*  
Richard Orr, Leonard Schuchman, *SATEL, USA*  
W. Dan Williams, *NASA Headquarters, USA*  
Michael Collins, *ASRC Management Services, USA*

K000101

**High Capacity Communications from Martian Distances Part 2: Spacecraft Antennas and Power Systems**

Richard E. Hodges, Mary A. Kodis, Larry W. Epp, Hemali N. Vyas, *NASA - Jet Propulsion Laboratory, USA*  
Richard Orr, Leonard Schuchman, *SATEL, USA*  
Michael Collins, *ASRC Management Services, USA*  
Obed Scott Sands, *NASA Glenn Research Center, USA*  
W. Dan Williams, *NASA Headquarters, USA*

K000092

**High Capacity Communications from Martian Distances: Spacecraft Systems Engineering Trade Study**

Richard S. Orr, Leonard Schuchman, *SATEL, USA*  
Michael Collins, *ASRC Management Services, USA*  
Richard E Hodges, Hemali Vyas, *NASA - Jet Propulsion Laboratory, USA*  
Obed Scott Sands, *NASA Glenn Research Center, USA*  
W. Dan Williams, *NASA Headquarters, USA*

K000088

**High-Capacity Communications from Martian Distances Part 4: Assessment of Spacecraft Pointing Accuracy Capabilities Required for Large Ka-Band Reflector Antennas**

Richard E. Hodges, John Huang, *NASA - Jet Propulsion Laboratory, USA*  
Obed Scott Sands, *NASA Glenn Research Center, USA*  
Samir Bassily, *Boeing Satellite Development Center, USA*

K000058

**Analysis of Ka-Band Radiometric Data Acquired During Cruise of the Mars Reconnaissance Orbiter**

David D. Morabito, Ricardo Mendoza, Dolan Highsmith, James Border, Shervin Shambayati, *NASA - Jet Propulsion Laboratory, USA*

K000084

**NASA's Space Communication Architecture for Exploration and Science from 2010-2030**

James S. Schier, *NASA Space Operations Mission Directorate/Space Communications Office, USA*

Thursday, 28 September

08:30 - 09:30 - Room Ferdinando I

**Session 7: Interplanetary Communication 2**

Chaired by: **P. LO GALBO**, *ESA, The Netherlands*

K000011

**Considerations for Lunar Relays with Millimeter Wave and IR Communications**

Paul Christopher, *PFC Associates, USA*

K000083

**RF and Optical Communications: a Comparison of High Data Rate Returns from Deep Space in the 2020 Timeframe**

W. Dan Williams, *NASA Headquarters, USA*  
Michael Collins, *ASRC Management Services, USA*  
Obed Scott Sands, *NASA Glenn Research Center, USA*

Don Boroson, *MIT Lincoln Labs, USA*

James Lesh, Abhijit Biswas, *NASA - Jet Propulsion Laboratory, USA*

Richard Orr, Leonard Schuchman, *SATEL, USA*

K000095

**Guaranteeing Reliable Communications in Cislunar Missions: CCSDS File Delivery Protocol and Erasure Coding Schemes**

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

Harald Ernst, *DLR-German Aerospace Center, Germany*

K000078

**Relativistic Transformations for Time Synchronization and Dissemination in the Solar System**

Robert A. Nelson, *Satellite Engineering Research Corporation, USA*

08:45 - 09:30 - Room Ferdinando II

**Session 8: Communication Protocols 1**

Chaired by: **S. TIRRO**, *Space Engineering, Italy*

K000026

**Voice Over IPsec in a DVB-RCS Network**

Nizar Jegham, Nicolas Lerouge, *EADS Astrium, France*

Gilles Roussel, *Institut Gaspard Monge, Université Marne-La-Vallée, France*

K000079

**Supporting Real-Time Services on DVB-RCS Environments**

Nam-Kyung Lee, Ki-Seop Han, Deock-Gil Oh, *ETRI, South Korea*

Soo-Hoan Chae, *Aviation University, South Korea*

K000047

**Next Generation IP Multimedia Architectural Study for Satcom Networks**

Marco Conte, Ferdinand Schlapansky, Marco Paternostro, *Siemens AG Österreich, Austria*

09:30 - 10:30 - Room Ferdinando I

**Session 9: Ground Systems 2**

Chaired by: **B. PERROT**, *SES-Global, Luxembourg*

K000067

**Performance for DVB-S2 ASIC Receiver**

William Thesling, Fan Mo, Matt Nimon, Craig Baker,  
Richard T. Gedney,  
*Efficient Channel Coding, USA*

K000057

**Design and Implementation Challenges in Ka/Ku  
Dual-Band Satcom-on-the-Move  
Terminals for Military Applications**

Cahit Ozbay, Garret L. Schneider, Matthew J.  
Sherman, James A. Benjamin, Donya He,  
William Teter, *BAE Systems Network Enable Solutions,  
USA*

K000034

**Ka-Band In-Orbit Testing at SES ASTRA**

Frank Zimmer, Ray Sperber, *SES ASTRA,  
Luxembourg*

K000120

**50-Watt Ka-Band SSPA for Mobile Satcom**

Marcelo Garzon, Sasha Barbu, Andre Melanson, Jack  
Shi, Ilya Tchaplina, *ITS Electronics,  
Canada*

09:30 - 10:30 - Room Ferdinando II

**Session 10: Propagation and Fade Mitigation 1**

Chaired by: **R. J. ACOSTA**, *NASA Glenn Research  
Center, USA*

K000023

**Outage Capacity Statistics of MIMO Satellite  
Networks Operating at Ka Band and Above**

Konstantinos P. Liolis, Athanasios D. Panagopoulos,  
Panayotis G. Cottis, *National Technical  
University of Athens, Greece*

K000060

**Fade Dynamics on Earth-Satellite Ka-Band Links:  
Beacon and Radiometer  
Measurements**

Armando C. Rocha, Rui F. Teixeira, José C. Neves,  
*University of Aveiro, Portugal*

K000075

**Doppler Spectrum of the Multipath Fading Channel  
in Mobile Satellite Systems with  
Directional Terminal Antennas**

Christos Kasparis, Peter King, Barry G. Evans, *CCSR -  
University of Surrey, UK*

K000111

**Joint Attenuation-Depolarisation Statistics  
Measured at 18.7 GHz in the Spino d'Adda  
Station with the ITALSAT-F2 Satellite**

Aldo Paraboni, Carlo Capsoni, Carlo Riva, *Politecnico  
di Milano, Italy*

10:30 - 11:00 – Coffee Break

11:00 - 12:45 - Room Ferdinando I

**Session 11: Antennas**

Chaired by: **F. GARGIONE**, *Satellite Systems Consultant, USA*

K000072

**The Potential for Gossamer Deployable Antenna Systems in Ka-Band Exploration and Science Communications Architectures**

Robert R. Romanofsky, Irene K. Bibyk, Bryan Welch, *NASA Glenn Research Center, USA*  
Kevin Lambert, *NASA/Analex Corp., USA*

K000039

**Low Profile Antennas for Land and Aeronautical Satcom**

Martin William Shelley, Javier Vazquez, *ERA Technology Ltd., UK*

K000021

**Low-Profile Auto-Tracking Antenna System for Broadband Mobile Satellite Communications**

Tomihiko Yoshida, Naoki Honma, Hiroshi Tanaka, Tadahiro Sueyoshi, Toshihiro Tsuchida, Hiroshi Kazama, *NTT Corporation, Japan*

K000071

**S-Band Antenna Candidate Design for TDRSS-C Enhanced Multiple Access Array System**

Roberto J. Acosta, James A. Nessel, Irene K. Bibyk, *NASA GRC, USA*  
Carol L. Kory, Kevin Lambert, *NASA/Analex Corp., USA*  
Armen Caroglanian, *NASA GSFC, USA*

K000074

**A Review of Antenna Technologies for Future NASA Exploration Missions**

Felix A. Miranda, James A. Nessel, Robert R. Romanofsky, Roberto J. Acosta, *NASA GRC, USA*

K000112

**European Large Deployable Antenna: Applications and Development Status**

Francesco Mini, G.L. Scialino, Maurizio Milano, Paolo Conforto, P. Pellegrino, V. Lubrano, *Alcatel Alenia Space, Italy*  
D. Caswell, J. Santiago Prowald, K. Van't Klooster, *ESA-ESTEC, The Netherlands*  
A. Cherniavsky, V. Korneev, *Rocket and Space Corporation ENERGIA, Russia*  
I. Vorobey, A. Fedoseev, *NPO EGS, Russia*

K000122

**Multiband Antennas for Military Satellite Communications**

Drew Trainor, Philip Langlois, R. Thomas Newman, John Burke, *Millitech, Inc., USA*

11:00 - 13:00 - Room Ferdinando II

**Session 12: Architectures 2**

Chaired by: **C. ELIA**, *ESA, The Netherlands*

K000036

**AMERHIS: Exploitation and Service Definition in an Interactive Regenerative Satellite Network for Mesh Communications**

Ignacio Jimenez, Isaac Moreno, *Alcatel Alenia Space, Spain*

K000035

**GoS of Broadband Satellite Networks with On-Board Processor**

Anca J. Vermesan, *Analog & Digital AS, Norway*  
Fernando Vallejo, *Alcatel Alenia Space, Spain*

K000090

**Waveform Design for Ka-Band SATCOM High Data Rate Links**

Mario A. Blanco, Marc N. Richard, *The MITRE Corporation, USA*

K000019

**Multicast and Mobility Over Satellite Using IPv6**

Marie-Paule Kluth, *Astrium, France*  
Patrick Paul, *6WIND, France*  
Thomas Noël, *LSIIT, France*  
Christophe Donny, Patrick Gelard, *CNES, France*

K000099

**Deployed Modular Multi-Beam Active Phased Arrays for Space Communications**

Shey S. Sabripour, *Lockheed Martin Commercial Space Systems, USA*

K000048

**Investigation of Advanced Satellite Applications Adapted to Developments Needs in Insular and Mountainous Countries**

Constantinos Kassianides, Dimitrios Kagklis, *HELLAS SAT, Greece*  
Menelaos Sotiriou, Evangelos Tsiopoulos, *Q-PLAN S.A, Greece*  
Antonella Esteves, *Avanti Communications Ltd, UK*  
Bruno Perrot, *SES GLOBAL, Luxembourg*

K000068

**Priority Adjustment in a Transparent P2P Proxy/Caching System for Satellite-Assisted Isolated Networks**

Rafael Asorey-Cacheda, Francisco Javier González-Castaño, *Universidad de Vigo, Spain*  
J.I. Moreno-Novella, *Universidad Carlos III de Madrid, Spain*

K000061

**Satellite-Based WCDMA for a UHF Military Communication System**

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

13:00 - 14:30 – Lunch

14:30 - 16:00 - Room Ferdinando I

**Session 13: Advances in Components 2**

Chaired by: **A. VERNUCCI**, *Space Engineering, Italy*

K000004

**60 GHz Solid-State Driver Amplifier**

Messiah Khilla, Klaus Schieber, Dirk Scharlewsky,  
*TESAT Spacecom, Germany*  
Klaus Solbach, *University Duisburg-Essen, Germany*

K000053

**The MHOMS 1 Gigabit/s ACM Modem Prototype**

Domenico Giancristofaro, Massimo Fonte, Ascolino  
Bernardi, Isaia Martinazzo, Mariano Livi,  
Mauro Capannolo, *Alcatel Alenia Space, Italy*  
Alberto Ginesi, *ESA - ESTEC, The Netherlands*  
Guido Montorsi, Sergio Benedetto, *Politecnico di  
Torino, Italy*  
Marco Luise, Mauro Straniero, *Università di Pisa, Italy*

K000065

**Development of On-Board ATM Switch (ATMS) for Winds**

Takeo Kumagai, Hideki Katagiri, *NEC Toshiba Space  
Systems, Japan*  
Ryutaro Suzuki, Naoko Yoshimura, Yukio Hashimoto,  
Suguru Takahashi, *NICT, Japan*  
Seiichi Uno, Mirei Maeda, *NEC Engineering, Japan*

K000085

**HI-FI Tunable, Low Noise Ka-Band Signal  
Generator Flight Unit: Performance and  
Future Applications**

Graham Arbery, Dino Mason, Dennis Henry, Zakir  
Ahmad, *COM DEV, Canada*

K000054

**New Generation Solarbus Solar Array – Design,  
Qualification Test Results &  
Performances of the New Generation High Power  
Solar Generators (8-20KW)**

Freddy Geyer, *Alcatel Alenia Space, France*

K000096

**Development of Hermetically Sealed Enclosure for  
MEMS in Chip-on-Flex Modules  
Using Liquid Crystalline Polymer (LCP)**

Morgan Chen, Anh-Vu Pham, *University of California at  
Davis, USA*  
Joe Iannotti, Nicole Evers, Chris Kapusta, William  
Kornrumpf, *General Electric Global  
Research Center, USA*  
John Maciel, *Radant MEMs, USA*  
Nafiz Karabudak, *Lockheed Martin Commercial Space  
Systems, USA*

14:30 - 16:00 - Room Ferdinando II

**Session 14: Communication Protocols 2**

Chaired by: **N. SALZA**, *MARS, Italy*

K000087

**Software Defined Radio Based Multi-Mode Satellite  
Terminal over DVB-RCS**

Floriano De Rango, Fiore Veltri, Amilcare Franco  
Santamaria, Mauro Tropea,  
Peppino Fazio, Salvatore Marano, *University of  
Calabria, Italy*  
Giovanni Nicolai, *Aersat, Italy*

K000028

**Cross-Layer Design for TCP Applications and VoIP  
over Satellite**

Maria Kalama, Marie-Paule Kluth, Stephane Mourgues,  
*EADS Astrium, France*  
Michel Marot, Armando Garcia Berumen, *CNRS-  
SAMOVAR/GET-INT, France*  
Alessandro Cardoso, Christophe Donny, Milena  
Planells, *CNES, France*

K000055

**The Satellite Data Dissemination System over  
Amerhis**

Bernhard Collini-Nocker, *Global Communication &  
Services, Austria*  
Stefano Badessi, *ESA/ESRIN, Italy*  
Davide Tomassini, *Vitrociset (ESA/ESRIN), Italy*

K000027

**ACM Optimization in DVB-RCS Channels for TCP  
Transmissions**

Nedo Celandroni, Erina Ferro, Alberto Gotta, *CNR-  
ISTI, Italy*  
Franco Davoli, *DIST-University of Genoa and CNIT,  
Italy*

K000049

**Framing Efficiency Optimization for DVB-S2  
Systems with QoS Guarantees**

Ronald Toegl, Cristina Parraga Niebla, DLR-German  
*Aerospace Center, Germany*  
Ulla Birnbacher, *Graz University of Technology, Austria*

K000093

**Performance Analysis of Mop-Based Bandwidth  
Allocation Schemes over  
Satellite Networks**

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

16:00 - 16:30 – Coffee Break

16:30 - 17:15 - Room Ferdinando I

**Session 15: Navigation 2**

Chaired by: **R. KERCZEWSKI**, *NASA Glenn Research Center, USA*

K000024

**Impact of the Queue Discipline in an Aeronautical Satellite Communication System**

**Supporting Air Traffic Management (ATM)**

Ana Lara Simões, Afonso Coelho Nunes, *Skysoft Portugal, Portugal*

Erling Kristiansen, *ESA-ESTEC, The Netherlands*

K000077

**Key Issues for Navigation and Time Dissemination in NASA's Space Exploration Program**

Robert A. Nelson, *Satellite Engineering Research Corporation, USA*

Beryl Brodsky, A. J. Oria, *Overlook Systems Technologies, USA*

Joseph Connolly, O. Scott Sands, Bryan Welch, *NASA Glenn Research Center, USA*

Richard Orr, Leonard Schuchman, *SATEL, USA XXVIII*

K000044

**Joint Space-Time-Frequency Domain Interference Mitigation for Galileo L1 Band Receivers**

Marika Casadei, Matteo Iubatti, Raffaella Pedone, Giovanni E. Corazza, *University of*

*Bologna, Italy*

Rodolfo Crescimbeni, *Galileo Joint Undertaking, Belgium*

16:30 - 17:30 - Room Ferdinando II

**Session 16: Architectures 3**

Chaired by: **M. BRANCATI**, *Telespazio, Italy*

K000082

**NASA's Standard Open Architecture for Software Defined Radios in Space: the**

**Space Telecommunications Radio System**

Frederick Patten Eblen, *NASA Headquarters, USA*

K000037

**Integration of Satellite and Terrestrial Wireless Access Systems into Fixed**

**Broadband Networks in Rural Deployment**

Anca J. Vermesan, *Analog & Digital AS, Norway*

José Luis Abia, Alberto Jordán, *Hispasat S.A, Spain*

K000014

**Optimization of the Boeing 702 for the DIRECTV Ka Band Mission**

Steven L. Apfel, *Boeing, USA*

K000118

**On Board Processing: Design Drivers for a Long Product Life Cycle**

Giacinto Losquadro, Giuseppe Matarazzo, Roberto Winkler, *Alcatel Alenia Space, Italy*

09:00 - 10:00 - Room Ferdinando I

**Session 17: New Systems**

Chaired by: **R. GEDNEY**, *Efficient Channel Coding (ECC), USA*

K000001

**First Year Experience with North America's First Commercial Ka-Band System**

Paul Bush, Peter Smith, *Telesat Canada, Canada*

K000051

**Experimental Results of the "TWISTER" EC Project**

Ariane Isoard, Laurent Thomasson, Greet Verelst, Maria Zapata, *Astrium SAS, France*

K000076

**HYLAS: Optimising the Delivery of Satellite Broadband Services for Rural Communities**

Antonella Esteves, David Bestwick, *Avanti Communications Ltd, UK*

K000097

**Assessing the Suitability of Q- & V- Bands for Future Satellite Communications Systems: the Alphasat Opportunity**

Giuseppe Codispoti, Lamberto Zuliani, *ASI, Italy*  
Michael Ludwig, Andrew Murrell, *ESA/ESTEC, The Netherlands*  
Victor Speziale, Antonio Vernucci, *Space Engineering, Italy*

09:00 - 10:00 - Room Ferdinando II

**Session 18: Communication Protocols 3**

Chaired by: **F. MARCONICCHIO**, *ASI, Italy*

K000086

**QoS Multicast Routing Algorithm over Hybrid Hap-Satellite Networks**

Floriano De Rango, Mauro Tropea, Amilcare Franco Santamaria, Salvatore Marano, *University of Calabria, Italy*

K000018

**Network Security and Performance Evaluation of ML-IPSec over Satellite Networks**

Michele Luglio, Cesare Roseti, *University of Rome Tor Vergata, Italy*

K000025

**Design of a System Framework of the Inmarsat BGAN Protocol Stack**

Prashant Pillai, Anju Pillai, Kai Xu, Vince Chook, Pauline Chan, Rosemary Wyatt-Millington, *University of Bradford, UK*  
Paul Febvre, *Inmarsat Ltd, UK*

K000043

**Efficiency-Aware Resource Management in Broadband Satellite Systems**

Anca J. Vermesan, *Analog & Digital AS, Norway*  
Erling Kristiansen, *ESA-ESTEC, The Netherlands*

10:00 - 10:30 – Coffee Break

10:30 - 12:15 - Room Ferdinando I

**Session 19: Mobile Broadband Services**

Chaired by: **R. VIOLA**, *Autorità per le Garanzie nelle Comunicazioni (AGCOM), Italy*

**Invited Speech by:**

Roberto Viola, *Secretary General, AGCOM, Italy*

K000015

**The Role of Fixed and Mobile Future Satcom Systems**

Paolo Ricci, *SITAB Consortium, Italy*  
Marcello Spagnulo, *Finmeccanica, Italy*

K000017

**A Satellite Based Wireless Network for Telemedicine: the TELESAL Project**

Stefano Arenaccio, *Space Engineering, Italy*  
Fabrizio Aversa, *Kell, Italy*  
Michele Luglio, *University of Rome Tor Vergata, Italy*

K000056

**Mobility Architectures for DVB-S/RCS Satellite Networks**

Thierry Gayraud, Olivier Alphand, Pascal Berthou, *LAAS-CNRS, France*  
Cedric Baudoin, Laurence Duquerroy, *Alcatel Alenia Space, France*

K000094

**OPTESS: Offshore Platforms Telemedicine Service Via Satellite**

Mario Marchese, *University of Genoa, Italy*  
Fabio Bagnoli, Laura Giovanelli, *D'Appolonia, Italy*  
Tomaso de Cola, *CNIT, Italy*

K000073

**Optimum Waveforms for Broadband Mobile Satellite Communications**

Michael de La Chapelle, Chris McLain, *Boeing, USA*

K000103

**The Use of the Satellite for Mobile Television Services: Standardization, Business Models and Regulatory Issues**

Giovanni Santella, Roberto De Martino, *AGCOM, Italy*

10:30 - 12:00 - Room Ferdinando II

**Session 20: Propagation and Fade Mitigation 2**

Chaired by: **A. PARABONI**, *Politecnico di Milano, Italy*

K000003

**Approach for the Modelling of Space-Time Rain Field Dynamics Using a 3-State Cellular Automaton**

Adolfo Núñez, Vicente Pastoriza, Perfecto Mariño, Fernando Pérez Fontán, *University of Vigo, Spain*  
Uwe-Carsten Fiebig, *DLR-German Aerospace Center, Germany*

K000022

**Interference Performance Analysis of a Broadband Satellite Downlink Including**

**the Noise Temperature Increase Due to Rain**  
Athanasios D. Panagopoulos, *National Technical University of Athens and ASPETE, Greece*  
Vassileios K. Sakarellos, John D. Kanellopoulos, *National Technical University of Athens, Greece*  
George E. Chatzarakis, *ASPETE, Greece*

K000029

**Ka-Band Site Diversity: Experimental Results from the UK**

Sarah A. Callaghan, Spiros Ventouras, *CCLRC-Rutherford Appleton Laboratory, UK*  
Joe Waight, *CCLRC-Chilbolton Observatory, UK*

K000040

**An Integrated Approach to the Rain Attenuation Problem in Ka Band Communications Satellites**

Marco Lisi, *Telespazio, Italy*  
Piero Angeletti, *European Space Agency, The Netherlands*

K000059

**Ka-Band Attenuation Analysis: Case Satellite Communication System in Indonesia**

Muhamad Asvial, Kurnia R. Supriadi, *Center for Information and Communication Engineering Research (CICER), University of Indonesia, Indonesia*

K000100

**Measurements of K-Band Carrier Amplitude and Phase Fluctuations Due to Atmospheric Effects Via Interferometry**

Roberto J. Acosta, James A. Nessel, Irene K. Bibyk, *NASA Glenn Research Center, USA*  
Brian Frantz, *Verizon, USA*  
David D. Morabito, *NASA - Jet Propulsion Laboratory, USA*

12:15 - 13:00 - Room Ferdinando I

**Closing Session**

K000066

**Broadband Satellite Service Demand – A New Forecast**

Roger J. Rusch, *TelAstra, USA*

**Closing Remarks by:**

- Frank Gargione, *Satellite Systems Consultant, USA*

- Franco Marconicchio, *ASI, Italy*

13:00 - 14:30 – Lunch

14:30 - 17:20 - Room Ferdinando I

**Fourth BroadSky Workshop**

Moderated by: **N. Kadowaki**, *ATR, Japan*

14:30 - 14:35     **Opening**

14:35 - 15:00   **Opening Presentation: Overview of Satellite Communication R&D in Japan**

Shingo Omori, *NICT, Japan*

15:00 - 15:30   **Ka-Band Propagation Study in Japan – Nivel Attenuation Mitigation Technologies for Future Ka-Band SatCom**

Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

15:30 - 15:45   *Coffee Break*

15:45 - 16:15   **Experimental Plan of Navigation System and Time Comparison using Engineering Test Satellite-VIII**

Yasuhiro Takahashi, Tadahiro Gotoh, Fumimaru Nakagawa, Jun Amagai, Shin'ichi Hama, *NICT, Japan*

Hiroyuki Noda, Motokazu Shikatani, *JAXA, Japan*

16:15 - 16:45   **Japanese Satellite Navigation System Demonstration with Quasi-Zenith Satellite System (QZSS)**

Mikio Sawabe, *JAXA, Japan*

16:45 - 17:15   **Design of the Time Management System for Satellite Positioning System using Quasi-zenith Satellite**

Yasuhiro Takahashi, Jun Amagai, Miho Fujieda, Kazuhiro Kimura, Shin'ichi Hama, *NICT, Japan*

Motohisa Kishimoto, Satoshi Kogure, Mikio Sawabe, *JAXA, Japan*

17:15 - 17:20   **Closing Remarks**

Shingo Omori, *NICT, Japan*

## GENERAL INFORMATION

### Venue

The 12<sup>th</sup> Ka and Broadband Communications Conference and the 4<sup>th</sup> BroadSky Workshop are held at the Grand Hotel Parker's in Naples (Italy), Corso Vittorio Emanuele 135.

### Language

The working language of the Ka and Broadband Communications Conference and the BroadSky Workshop will be 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 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.

### 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

PCs connected to the Internet will be available at the Ground Floor of the Grand Hotel Parker's. WiFi internet access is possible in every room and in any public space of the Hotel.

### Liability and Insurance

Neither the Conference Organizers, nor the Grand Hotel Parker's 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.

## Tips

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Tips are a free choice.

## Smoking Policy

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Out of courtesy to others, smoking is not permitted in any sessions.

## Restrictions

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Audio or video recording of any session during this conference is prohibited.

## SOCIAL EVENTS

### Welcome Cocktail Reception at Palazzo delle Arti di Napoli (PAN)

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*Wednesday, 27 September, 19:30 – 21:30*

The Welcome Cocktail Reception takes place at the **Palazzo delle Arti di Napoli (PAN)**, via dei Mille 60. Wine and beverages are offered to participants and their spouses together with typical snacks and dishes from Italy.

A bus service from and to the hotels is organized for registered attendees.

The site is kindly made available by the **City of Naples** and by the **City Council for Culture**, who has acquired and restored this beautiful 17<sup>th</sup> century building, formerly Palazzo Roccella, now housing the Documentation Center for Contemporary Arts ( [www.palazzoartinapoli.net](http://www.palazzoartinapoli.net) ).

***The Welcome Cocktail Reception is kindly sponsored by Alcatel Alenia Space Italia.***

### Conference Dinner at Villa Rocca Matilde in Posillipo

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*Thursday, 28 September, 20:00 – 24:00*

The Conference Dinner takes place at Villa Rocca Matilde in Naples/Posillipo, Via Posillipo 222. This event is a must for all conference attendees and their companions. The dinner offers an opportunity to mingle, revel, and relax after the long day spent on the technical issues and concerns.

A bus service from and to the hotels will be organized for registered attendees.

This luxury house built in 18<sup>th</sup> century in the heart of Posillipo overlooking the Gulf of Naples, draws its walls between pine, palm trees and flowered gardens.

***The Conference Dinner is kindly sponsored by Camera di Commercio Industria Artigianato ed Agricoltura di Napoli (CCIAA – Chamber of Commerce of Naples).***

# REGISTRATION INFORMATION

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

- on Wednesday, 27 September 2006 from 8:00 to 18:00,
- 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 all Plenary and Social events.

## Registration fees:

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**Conference Fee**      **before 7 August 2006: €750**      **after 7 August 2006: €900**

Included in the Conference registration fee are:

- Access to the technical sessions,
- Access to 4th BroadSky Workshop,
- Proceedings of the Conference (printed book),
- CD ROM of the Conference Proceedings,
- Access to the online Proceedings of the Conference,
- Coffee breaks (Wednesday, Thursday, Friday, 27-28-29 September),
- Lunch (Wednesday, Thursday, Friday, 27-28-29 September),
- Welcome Cocktail Reception on Wednesday, 27 September,
- Conference Dinner on Thursday, 28 September.

## 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, 2006. 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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For more information, apply to:  
Clotilde Canepa Fertini  
Email: [clotilde.fertini@kaconf.org](mailto:clotilde.fertini@kaconf.org)