



**2nd International Conference on
Personal Satellite Services**

PSATS'10

4-5 February 2010, Rome, Italy

www.psats.eu



Technical Program

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Special Session on Delay Tolerant Network

Dr. Haitham Cruickshank (University of Surrey, UK)
Prof. Carlo Caini (University of Bologna, Italy)

Special Session Quantum Satellite Communications

Prof. Paolo Villorosi (University of Padua, Italy)
Dr. Rupert Ursin (Austrian Academy of Science, Austria)

Special Session on Access Quality Processing and Applications of Satellite Imagery

Dr. Giuseppe Conti (Fondazione Graphitech, Italy)
Prof. Mattia Crespi (University of Rome "La Sapienza", Italy)

Special Session on Satellite Based Emergency Services

Dr. Mauro De Sanctis (University of Rome, "Tor Vergata", Italy)
Dr. Simone Morosi (University of Florence, Italy)

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Antonella Molinaro (University "Mediterranea" of Reggio Calabria, Italy)
Hongfei Du (Alcatel-Lucent Bell Labs, USA)
Matteo Berioli (German Aerospace Center: DLR, Germany)
Gianmarco Baldini (Joint Research Centre, European Commission, Ispra, Italy)



PSATS'10 Message from General Chairs

It is our great pleasure to welcome you to the 2nd International Conference on Personal Satellite Services (PSATS'10), from 4-5 February 2010, in Rome, Italy.

The first question one could ask is: why another conference on satellite communications and services? Because, we think that there are still so many important unanswered questions which require a new forum of experts to discuss and find new solutions leading to technological revolutions in order to address the demands of future communications.

The big question is then: what is the role of satellites in future communications? Several other questions also would originate from this. - Are emerging standards going to make broadband satellite technologies affordable? What are the key space and ground technologies capable of economically complementing the terrestrial networks in the medium and longer terms? Are there any new applications which can boost the exploitation of broadband satellite networks? In practice, the key point is the evaluation of new technologies that can provide improved quality at reasonable costs and the analysis of the applications and services that can be either used only via satellite or whose added value is particularly meaningful if transported via satellite.

A first observation is that, in Europe, the enlargement of the community to 25 countries have increased the challenges: estimations indicate that, being Europe composed of 25 countries, many institutions and parts of Europe are not yet covered by terrestrial broadband access. The million dollar question is whether satellite technology can meet the demands at the service cost, with high values of reliability and quality of service comparable to the terrestrial solutions. Great challenges concerning digital divide are also more evident in Africa, Asia and South America and satellites have a real chance to play a key role. *"..The lack of economical access to wired broadband resources at a significant number of facilities will pose a critical hindrance to business operations....Satellites will be essential to enable comprehensive broadband services with the performance required to support the mission-critical applications needed by corporate, SME, and SOHO markets"* (R. Campitelli from Frost and Sullivan, February 2004). This sentence is still true.

Concerning the technological issues, the principle of standardization is topical to help integration among networks of different providers. Standardized products will help reduce the costs lowering the industrial risks and the competition and driving up the mass production, but the success of satellites is strictly linked to new technological solutions and offered services. In this view key points of concern are: power and bandwidth efficient modulations, active coding and modulation for uplinks and downlinks, resource reservation algorithms, quality of service management, new

high performance architectures, low cost terminals, portable and mobile terminals, network and multimedia integration, applications, and delay tolerant networking. It is important to mention also new frontiers like quantum satellite technology.

What about applications that can have full benefit from satellite environments or where satellite links are essential? A possible broad classification is: service provision in remote and low dense areas, aeronautical services, interplanetary communications. Of topical importance is also the integration of satellite communication, navigation, and localization, where the role of signal and image processing is essential. Interesting applications in this field are: disaster prediction, emergency services, safety for critical users, search and rescue, internet connection and data transmission for maritime environment, aviation and trains.

All the mentioned topics are part of the program of PSATS'10 and ready to be shared and discussed!

Our goal is to make your participation in the 2nd International Conference on Personal Satellite Services a valuable experience from both professional and personal perspectives. We really do hope the participation in PSATS'10 and the professional discussions with other colleagues can enrich you professionally, and enable you to find new contacts and friends leading to fruitful scientific activities and projects.

Finally we would like to thank all the authors, the organizing committee members, the reviewers, the Keynote speaker, the technical sponsors and the ICST, for their contributions to make this event a successful one.

Welcome to Rome!

Warm Regards,

Mario, Marina, and Kandeepan

PSATS'10 General Chairs:

Prof. Mario Marchese (University of Genoa, Italy)

Prof. Marina Ruggieri (University of Rome, "Tor Vergata", Italy)

Dr. Kandeepan Sithampanathan (Create-Net, Italy)

Message from the TPC Chairs

It is our pleasure to take the opportunity to share with you for the second time in Rome our vision of future personal satellite services.

We think that this conference (among those on satellite communications) has significant interest and originality. There is the need for a conference, focused on personal satellite services, that represent a niche in the satellite market mastered by digital television broadcasting and broadband access. A distinctive feature of this conference is the focus on future satellite services centred around a person, accounting for his/her needs and providing added value services.

The technical program is structured into two tracks (satellite communications and satellite networking, respectively) and includes four special sessions on “Delay Tolerant Networks”, “Quantum Satellite Communications”, “Access Quality Processing and Applications to Satellite Imagery”, and “Satellite Emergency Services”.

The topics covered by the conference include: modulation and coding schemes, channel estimation, QoS management, delay tolerant network architectures, security issues, quantum communication, new user applications and emergency services.

The quality of the papers was guaranteed through a rigorous review process, and we wish to thank all the reviewers for providing timely and high quality reviews.

We hope that PSATS 2010 will be a rewarding, productive and enjoyable conference!

TPC Chairs

Dr. Claudio Sacchi (University of Trento, Italy)

Dr. Giovanni Giambene (University of Siena, Italy)

Dr. Mauro De Sanctis (University of Rome, “Tor Vergata”, Italy)

Title: ICT Evolution and the Opportunities for Satellite Communications

By: Prof. Giovanni Corazza, University of Bologna, Italy

The keynote speech will dwell on the trends that are characterizing the transformation from the industrial to the information society, identifying the crucial role that Information and Communication Technologies play in this revolution. We will try to go as far as describing the "DNA of ICT evolution". Out of this general framework, we will pin out the most promising opportunities for satellite communications.

GIOVANNI E. CORAZZA - BIO

Giovanni Corazza is a Full Professor at the University of Bologna, Head of the Department of Electronics, Computer Science and Systems (DEIS), and leader for Wireless Communications inside the Advanced Research Centre for Electronic Systems (ARCES). He was Chairman of the School for Telecommunications in the years 2000-2003, Chairman of the Advanced Satellite Mobile Systems Task Force (ASMS-TF), Founder and Chairman of the Integral Satcom Initiative (ISI), a European Technology Platform devote to Satellite Communications. Since 1997, he is Editor for Communication Theory and Spread Spectrum for the IEEE Transactions on Communications. He is author of more than 200 papers, and received the Marconi International Fellowship Young Scientist Award in 1995, the IEEE 2009 Satellite Communications Distinguished Service Award, the 2002 IEEE VTS Best System Paper Award, the Best Paper Award at IEEE ISSSTA'98, at IEEE ICT2001, and at ISWCS 2005. He has been the General Chairman of the IEEE ISSSTA 2008, ASMS 2004, ASMS 2006, ASMS 2008, ASMS 2010 Conferences. His research interests are in wireless and satellite communications, information society, estimation and synchronization, spread spectrum and multi-carrier transmission, upper layer coding, navigation and positioning.



Technical Program

Registration

4th February: 8.00am – 5.00 pm

5th February: 8.00am – 3.00pm

DAY 1: 4th of February, Thursday, 2010

Conference Opening (9.00am-9.15am)

Conference chair welcome speech

Keynote Speech (9.15am-10.15am)

Title: ICT Evolution and the Opportunities for Satellite Communications

By: Prof. Giovanni Corazza, University of Bologna, Italy

Morning Tea Break (10.15am-10.45am)

Track-1: Satellite Communications: Coding and Modulation (10.45am-12.15pm)

1	FM Discriminator for AIS Satellite Detection <i>Maria Angeles Jurado Gallardo and Ghislain Ruy</i>
2	Simulation of a feasible Galileo system operating in L1 and E5 bands <i>Spyridon K. Chronopoulos, Christos Koliopoulos, Antigoni Pappa and Constantinos T Angelis</i>
3	Compensations of Nonlinear Effects of TWTA for Signal Super-Positioning Satellite Communication Systems <i>Kenta Kubo, Shigeo Naoi, Yozo Takeda, Ryusuke Miyamoto, Takao Hara, and Minoru Okada</i>
4	Overview of PHY-layer Design Challenges and Viable Solutions in W-band Broadband Satellite Communications <i>Claudio Sacchi and Tommaso Rossi</i>

Lunch Break
(12.15pm-1.30pm)

Track-2:
Satellite Communications: Multimedia Integration
(1.30pm-2.30pm)

5	On The Consideration of An UMTS/S-UMTS Based GEO-MSS System Architecture Design <i>Jianjun Wu, Yuxin Cheng, Jiancheng Du, Jian Guo, and Zhenxing Gao</i>
6	Ka-band satellite consumer triple-play and professional video services <i>Guillaume GB BENOIT, Hector FENECH, Stefano PEZZANA and Alessia Tomatis</i>
7	Comparative Analysis of Image Compression Algorithms in Deep Space Communications <i>Igor Bisio, Fabio Lavagetto, Mario Marchese</i>

Track-3:
Satellite Networks: Quality of Service and Architectures
(2.30pm-3.30pm)

8	End-to-end QoS Measurement over a DVB-RCS Satellite Network <i>Muhammad Ali, Lei Liang, Zhili Sun, Haitham Cruickshank, Paul T Thompson, Tajani Bouquentar, and Nader Alagha</i>
9	A cross-layer approach to dynamic bandwidth allocation in Satellite Networks <i>Andrea Fiaschetti, Antonio Pietrabissa, and Laura Pimpinella</i>
10	End-to-End QoS Evaluation of IP-Diffserv Network over LEO Satellite Constellation <i>Lukman Audah, Zhili Sun, and Haitham Cruickshank</i>

Afternoon Tea Break
(3.30pm-4.00pm)

Track-4:
Satellite Networks: Applications and Services
(4.00pm-5.30pm)

11	No-reference H.264/AVC Statistical Multiplexing for DVB-RCS <i>Hamed Ahmadi Aliabad, Sandro R. F. Moiron, Fleury Martin, and Mohammad Ghanbari</i>
12	Towards an IP/GSE-only signalling framework for DVB transmission systems <i>Nimbe L Ewald, and Gorry Fairhurst</i>
13	Hybrid Satellite-Optical Ring Network for Regional Blackspots in Australia's National Broadband Network <i>Kandeepan Sithamparanathan, Chava Vijaya Saradhi, Sam Reisenfeld, Eryk Dutkiewicz, Nicolas Chuberre, and Pierre Fraise</i>
14	The Interplanetary Network Node: Architecture and Preliminary Performance Evaluation <i>Giuseppe Araniti, Igor Bisio, Mauro De Sanctis</i>
15	WiFi assisted GPS for extended location services <i>Saverio Cacopardi, Mauro Femminella, Gianluca Reali, Andrea Sadini, Fortunato Palella, Maurizio Turina, Andrea Vignoli, Giuseppe Confessore, Emanuela Scacchi, and Angela Maria Saraceno</i>

GALA DINNER - CONFERENCE BANQUET
4 February - 7pm onwards

DAY 2: 5th of February, Friday, 2010

Special Session-1:
Delay Tolerant Network (DTN)
(9.00am-10.30am)

16	Mitigating Denial of Service Attacks in Delay-and Disruption-Tolerant Networks <i>Godwin Okon Ansa, Enyenihi Henry Johnson, Haitham Cruickshank, and Zhili Sun</i>
17	Delay/Disruption Tolerant Network Architecture for Aircraft Datalink on Scheduled Routes <i>Mohamed Al Siyabi, Haitham Cruickshank, and Zhili Sun</i>
18	Access Control Framework for Delay/Disruption Tolerant Networks <i>Enyenihi Henry Johnson, Godwin Okon Ansa, Haitham Cruickshank, and Zhili Sun</i>
19	ID Based Cryptography and Anonymity in Delay/Disruption Tolerant Networks <i>Naveed Ahmad, Haitham Cruickshank, and Zhili Sun</i>
20	Virtualization Technologies for DTN testbeds <i>Carlo Caini, Rosario Firrincieli, Daniele Lacamera, and Marco Livini</i>

Morning Tea Break
(10.30am-10.45am)

Special Session-2:
Quantum Satellite Communications (QComm)
(10.45am-12.15pm)

21	On The Polarization Analysis Of Optical Beams For Use In Quantum Communications Between Earth And Space <i>Alberto Dall'Arche, Andrea Tomaello, Cristian Bonato, and Paolo Villoriesi</i>
22	100 MHz amplitude and polarization modulated optical source for free space quantum communications at 850 nm <i>M. Jofre, A. Gardelein, G. Anzolin, G. Molina-Terriza, J. P. Torres, M. W. Mitchell, and V. Pruneri</i>
23	Novel Techniques for Information Reconciliation, Quantum Channel Probing and Link Design for QKD <i>Marina Mondin, Fred Daneshgaran, Maria Delgado, and Fabio Mesiti</i>
24	Macro-qubit states for long range communication over a lossy channel <i>Chiara Vitelli, Lorenzo Toffoli, Fabio Sciarrino, and Francesco De Martini</i>
25	Using Redundancy-free Quantum Channels for Improving the Satellite Communication <i>Laszlo Bacsardi, Laszlo Gyongyosi, and Sandor Imre</i>

Lunch Break
(12.15pm-1.30pm)

Special Session-3:
Access Quality Processing and Applications of Satellite Imagery
(1.30pm-3.15pm)

26	Semi-automatic objects recognition process based on fuzzy logic <i>Federico Prandi and Raffaella Brumana</i>
27	GeoEye-1: analysis of radiometric and geometric capability <i>Mattia Crespi, Gabriele Colosimo, Laura De Vendictis, Francesca Fratarcangeli, Francesca Pieralice</i>
28	Local Detection of 3D Systematic Errors in Satellite DSMs: Case Studies of SRTM and ASTER in Lombardy <i>Maria Antonia Brovelli, Xuefei Liu, and Fernando Sanso</i>
29	Interactive access and processing of multispectral imagery: the user in the loop <i>Bruno Simões, Stefano Piffer, Angelo Carriero, Giuseppe Conti, and Raffaele De Amicis</i>
30	Time Series Analysis of the Digital Elevation Model of Kuwait Derived from Synthetic Aperture Radar Interferometry <i>K. S. Rao and Hala K. Al Jassar</i>

Afternoon Tea Break
(3.15pm-3.45pm)

Special Session-4:
Satellite Based Emergency Services
(3.45pm – 4.45pm)

31	Cooperative Strategies of Integrated Satellite/Terrestrial Systems for Emergencies <i>Simone Morosi, Sara Jayousi, and Enrico Del Re</i>
32	SDR Assisted Localization for Emergency Scenarios <i>Enrico Del Re, Luca Ronga, Luca Vettori, Simone Morosi, Letizia Lo Presti, Emanuela Falletti, and Marco Pini</i>
33	Hybrid System HAP-WiFi for Incident Area Network <i>G. Araniti, M. De Sanctis, S. C. Spinella, M. Monti, E. Cianca, A. Molinaro, A. Iera, and M. Ruggieri</i>