



Symposium on GPS/GNSS

IGNSS 2006

17 – 21 July 2006

Holiday Inn Surfers Paradise
Queensland, Australia



Special Rates for AIAA Members

ABN 50 493 173 615
www.ignss.org

Registration Brochure and Program

IGNSS 2006

Invitation from the President



It is with great pleasure that I invite you to join me at the Holiday Inn, Surfers Paradise, over the period 17 to 21 July for the IGSS 2006 Symposium. GNSS is entering an exciting expansion period with new signals in space, new constellations and new augmentation systems, all happening over the next two years. The symposium will provide a strong scientific program, enjoyable social functions and importantly an opportunity to meet with international colleagues to exchange and compare professional practices.

In addition to the keynote speakers, oral presentations, interactive poster sessions, workshops and trade exhibition, the International Subcommittee of the US Civil GPS Service Interface Committee (CGSIC) will organise an information session on Global Navigation Satellite System developments.

GNSS specialists from Australia and overseas will provide pre symposium workshops incorporating updates on established and emerging technologies.

Surfers Paradise is an ideal venue to enjoy a break from your busy routine. The Holiday Inn is located in the heart of Australia's most popular tourist destination, surrounded by chic boutiques, al fresco cafes, the renowned night life of Surfers Paradise and just 50 metres from the magnificent surf beach. The venue provides an ideal setting for an interesting event where you will have the opportunity to interact and socialise with your peers and meet some of the leading people in GNSS.

On behalf of the International Global Navigation Satellite Systems (IGNSS) Society and the organising committee, I look forward to welcoming you to IGSS 2006.

Keith McPherson
President
IGNSS Society Inc.

IGNSS Symposium Support Team

Rob Henshaw, CEO, IGSS Society Inc.
Krys Henshaw, Business Development Manager, IGSS Society Inc.
Allison Bertoni, Event Manager, IGSS Society Inc.

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Trade exhibition

The symposium will feature a trade exhibition consisting of suppliers of goods and services to the industry. Further information regarding sponsorship and exhibition opportunities can be downloaded from the web at www.ignss.org or contact Allison Bertoni on +61 7 3371 0333 or at ignss@ignss.org.

International Plenary Speakers



Guenter Hein

Director, Institute Of Geodesy and Navigation, University FAF Munich, Germany

Dr Guenter W. Hein is Director of the Institute of Geodesy and Navigation at the University FAF Munich. He is a member of the EC Galileo Signal Task Force and received the prestigious Johannes Kepler Award of the US Institute of Navigation in 2002 – the highest award worldwide in satellite navigation.



Hans Peter Marchlewski

General Councillor, Galileo Joint Undertaking, Brussels, Belgium

Mr. Peter Marchlewski has been the General Counsellor at Galileo Joint Undertaking, since September 2003. He was born in Cuxhaven in September 1947 and is married with three children. As a qualified civil engineer, his professional experience was mainly in the German Federal Ministry for Transport, Regional Planning, Building & Urban Development. Mr. Marchlewski held a position in the German Permanent Representation to the EU within the Transport Unit over several years.



Bruno Julien

Ambassador and Head of Delegation of the European Commission to Australia and New Zealand

His Excellency Mr Bruno Julien is the Ambassador and Head of Delegation of the European Commission to Australia and New Zealand. Mr Julien has worked with the European Commission in Brussels for 25 years, most recently as Head of the LIFE Unit in the Directorate-General for Environment, managing around 800 projects that form LIFE, the EU's financial instrument for the environment. Prior to that he served five years as Spokesman to several Commissioners, and has worked on agricultural trade and rural affairs matters for the Directorate-General for Agriculture and in the Washington Delegation.

IGNSS Technical Advisory Committee



Keith McPherson

Keith McPherson is the Manager GNSS for Airservices Australia. He was the 2004 recipient of the Royal Aeronautical Society's Sir Charles Kingsford Smith Memorial Medallion. He was selected by the Deputy Prime Minister of Australia to be an inaugural member of the government's Australian GNSS Coordination committee.



Chris Rizos

Chris Rizos is currently the Head of the School of Surveying and Spatial Information Systems at UNSW where he established over a decade ago the Satellite Navigation and Positioning group, today the premier academic GPS and wireless location technology R&D laboratory in Australia. Chris is a member of the Australian GNSS Coordination Committee.



Matt Higgins

Matt Higgins is a Principal Survey Advisor with the Department of Natural Resources and Mines, Queensland, Australia. From 2002 to 2006, Matt is Chair of Commission 5 on Positioning and Measurement in the International Federation of Surveyors (FIG). Matt also represents Queensland Government on the Geodesy Technical Sub-Committee of the Inter-governmental Committee on Surveying and Mapping for Australia and New Zealand.



Robert Lorimer

Rob is the founder and Managing Partner of Position One Consulting. He has twenty years international experience in pioneering GNSS and related technology into a wide variety of markets including marine, automotive, agriculture, mining, construction, and transport



Andrew Dempster

Andrew Dempster is Director of Research in the School of Surveying and Spatial Information Systems at the University of New South Wales. His research interests are signal processing for satellite navigation, novel receiver design concepts and new positioning technologies.

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Civil GPS Service Interface Committee (CGSIC) Meeting

Monday 17 July 2006

(This meeting is complimentary to all interested parties)

On Monday 17 July, the symposium will feature a session of presentations on Global Navigation Satellite System developments from the CGSIC.

All symposium delegates are invited to attend this session on a complimentary basis. Attendance at other sessions and workshops will attract the registration fees listed on the registration form.

The CGSIC has existed since 1987 to promote the exchange of information about the NAVSTAR Global Positioning System (GPS) among the worldwide civil user community. The U.S. Department of Transportation Assistant Secretary for Transportation Policy chairs the CGSIC. The Deputy Chair is the Commanding Officer of the U.S. Coast Guard Navigation Center. The CGSIC has several sub-committees.

CGSIC International Sub-Committee

- Provides an open international forum to collect and exchange information concerning GPS user needs and suggest courses of action to the Chair of the CGSIC on subjects of concern to the international community.
- Identifies the needs of nations for GPS information and distribution methods.
- Responds to requests and concerns submitted by the international civil user community, and forwards issues to the Chair of the CGSIC.
- Conducts international GPS information studies on civil user needs as requested by the Chair of the CGSIC.

CGSIC Preliminary Program

0900 - 1030	Session 1
0900 – 0915	Welcome Keith McPherson Vice Chair Asia Pacific
0915 – 0930	Welcome John Wilde CGSIC International Sub Committee Deputy Chair
0930 – 0945	Role of CGSIC IISC
0945 – 1000	GPS Policy Overview
1000 - 1030	Vulnerability
1030 – 1100	Morning Tea
1100 – 1230	Session 2
1100 – 1120	Civil NANUs & GPS Reporting
1120 – 1150	Carrier Phase-Based GNSS
1150 – 1230	Aviation use of GPS – Airservices Australia/ CASA
1230 - 1330	Lunch (at own expense)
1330 – 1500	Session 3
1330 – 1400	Australian Strategic Planning
1400 – 1420	Victorian Differential GPS Network
1420 – 1500	APEC GNSS Activities
1500 – 1530	Afternoon Tea
1530 – 1700	Session 4
1530 – 1600	Timing Standards in Australia
1600 – 1630	Interference
1630 – 1700	Discussion Group – Issues with the use of GPS in Australia and Region
1700	Close of CGSIC Sessions

Pre-Symposium Workshops

Tuesday 18 July 2006

(not included in IGNSS 2006 symposium registration fee, prices below are per person, per workshop)

To complement this symposium, the following series of specialist workshops are available.

Workshop delegates can register via the IGNSS 2006 registration form.

Registration fees are as follows:

2-hour workshops – Symposium registered delegates	\$195 per workshop
3-hour workshop – Symposium registered delegates	\$295 per workshop
2-hour workshops – Symposium non-registered delegates	\$295 per workshop
3-hour workshop – Symposium non-registered delegates	\$395 per workshop

Pre-Symposium Workshops Preliminary Program

0900 - 1200	Workshop 1: Design and Development of the European Satellite Navigation System Galileo Dr Guenter Hein Director, Institute of Geodesy & Navigation, University FAF Munich, Germany	
1200 – 1230	Lunch	
1230 – 1430	Workshop 2: Modelling and Real Time Simulation of GNSS Environmental Vulnerability Issues Graeme Hooper Managing Director & Joe Fleming Software Manager, GPSat Systems Australia, Vic, Australia	OR Workshop 3: Alternatives to GNSS for Outdoor & Indoor Positioning Dr Joel Barnes & Professor Chris Rizos , School of Surveying & Spatial Information Systems, The University of New South Wales, NSW, Australia
1430 – 1445	Afternoon Tea	
1445 - 1645	Workshop 4: GBAS/ GRAS for Global Use in Aviation Keith McPherson Manager GNSS, Airservices Australia, ACT, Australia	OR Workshop 5: Integration of GPS & INS - Principle, Implementation & Applications Dr Jinling Wang & Dr Yong Li School of Surveying & Spatial Information Systems, The University of New South Wales, NSW, Australia

Workshop 1: 0900 - 1200

Title:

Design and Development of the European Satellite Navigation System Galileo

Instructor:

Dr Guenter Hein Director, Institute of Geodesy and Navigation, University of FAF Munich, Germany

Instructor's Biography:

Dr Guenter W. Hein is Director of the Institute of Geodesy and Navigation at the University FAF Munich. He is member of the EC Galileo Signal Task Force and received the prestigious Johannes Kepler Award of the US Institute of Navigation in 2002 – the highest award worldwide in satellite navigation.

Workshop Synopsis:

0900 - 1000	1000 - 1100	1100 - 1200
Overall Architecture, Services and Expected Performance <ul style="list-style-type: none"> Galileo Architecture Drivers Galileo Space Segment and Satellite Payload Giove-A, B and In-Orbit Validation (IOV) Galileo Services and Expected Performance 	Galileo Signal-In-Space Definition and Interoperability <ul style="list-style-type: none"> Frequency and Signal Drivers Frequency and Signal Plan, Codes and Message Structure Compatibility Issues Interoperability Galileo-GPS (SIS, Time & Coordinate Reference Frame) 	Galileo Integrity <ul style="list-style-type: none"> Integrity Definition and User Requirements Integrity Chain in Galileo Architecture Integrity Concept and Integrity Algorithm Decision at User Level

Workshop 2: 1230 - 1430

Title:

Modelling and Real Time Simulation of GNSS Environmental Vulnerability Issues

Instructors:

Mr Graeme Hooper Managing Director & Joe Fleming Software Manager, GPSat Systems Australia, Vic, Australia

Instructors' Biographies:

Graeme Hooper graduated from Monash University in Electrical Engineering 1980, Graeme has been employed as Systems Engineer on many defence projects with several companies through the 1980's. In 1987, after joining Rockwell International (Aust), he spent several years contributing to military GPS integrations and receiver development in both the USA and Australia. In 1993 Graeme formed GPSat Systems P/L, an engineering company solely focused on industrial satellite navigation products and services and continues to work in this profession today.

Joe Fleming graduated from University of Calgary 2000 in Geomatics Engineering. In 2001, Joe joined NovAtel as a Geomatics Test Engineer responsible for developing various programs for analysing GPS receiver performance. In 2001 Joe joined the team at GPSat Systems assuming the role of Geomatics Engineer while also assuming responsibility for all R&D software development. Today, Joe continues to apply his geomatic skills supporting many clients both locally and internationally while also continuing to technically manage the ever growing software development team.

Workshop Synopsis:

All GNSS Receivers are vulnerable in varying degrees to external environmental conditions outside their control. How GNSS Receivers cope with the big four, "CAMI" (constellation, atmospheric, multipath and interference) ultimately defines both quality and performance for intended applications.

This workshop briefly introduces the CAMI topics with discussion on, the effects themselves, the different strategies employed by equipment manufacturers to cope, and then in real time, simulations / demonstrations of that effect using a GNSS Signal simulator exercising several different leading receiver varieties.

This workshop is targeted to those GNSS integrators wishing to both gain some insight into GNSS receiver vulnerability issues, how these CAMI effects manifest themselves on different receivers, and the use of real time GNSS signal simulation in a laboratory environment. It's anticipated that products from Spirent, NovAtel, NordNav, SIRF and others will be demonstrated during the workshop.

Workshop 3: 1230 - 1430

Title:

Alternatives to GNSS for Outdoor & Indoor Positioning

Instructors:

Dr Joel Barnes & Professor Chris Rizos School Of Surveying & Spatial Information Systems, The University of New South Wales, NSW, Australia

Instructor's Biographies:

Chris Rizos is a Professor and Head of the School of Surveying & Spatial Information Systems, at the University of New South Wales (UNSW). He obtained a Bachelor of Surveying and a Doctor of Philosophy both from the UNSW. Chris has been researching the technology and high precision applications of GPS since 1985. Prof Rizos is a Fellow of the Australian Institute of Navigation, a member of the Executive of the Satellite Division of the U.S. ION, a Fellow of the IAG, a member of the Governing Board of the IGS, and is currently President of the IAG's Commission 4 "Positioning and Applications".

Dr Joel Barnes is one of the senior researchers within the Satellite Navigation and Positioning (SNAP) group, at the School of Surveying & SIS, the University of New South Wales (UNSW) in Sydney, Australia. He obtained a Doctor of Philosophy in satellite geodesy from the University of Newcastle upon Tyne, UK. Joel has assisted in the development of the Locata receiver and testing of the Locata technology. Other current research interests include pseudolites, GPS receiver firmware customisation and high precision kinematic GPS positioning.

Workshop Synopsis:

For positioning and navigation applications GNSS is the first choice technology today. However for many everyday environments such as urban and indoors GNSS cannot provide the positioning requirements because satellite signals are easily obstructed.

This workshop will outline and discuss the latest developments in terrestrial-based positioning technology solutions for challenging GNSS applications, including: WiFi, RFID, UWB, Locata and others.

Workshop 4: 1445 - 1645

Title:

GBAS/ GRAS for Global Use in Aviation

Instructor:

Mr Keith McPherson, Manager GNSS, Airservices Australia, ACT, Australia

Instructor's Biography:

Keith McPherson is the Manager GNSS for Airservices Australia. He spent 21 years in the RAAF as a navigator and flight test navigator responsible for GPS testing. He was assigned to the USAF GPS Joint Program Office at Los Angeles AFB 1990-92, finishing as Chief of GPS Integration & Test. He won the US Air Force Association's (Los Angeles) Program Manager of the Year 1992 and the US Air Force Meritorious Service Medal for his work on GPS integrations. He was the 2004 recipient of the Royal Aeronautical Society's Sir Charles Kingsford Smith Memorial Medallion. He was selected by the Deputy Prime Minister of Australia to be an inaugural member of the government's Australian GNSS Coordination Committee and is presently the President of the International GNSS Society.

Workshop Synopsis:

This workshop will cover the theory behind applications of GBAS and GRAS. It will also cover the international standards of both systems. The workshop will cover the GBAS Category I application at Sydney International Airport and lessons learned. How GRAS integrates into a total navigation solution and also ADS-B will be covered.

Workshop 5: 1445 - 1645

Title:

Integration of GPS and INS – principle, implementation, and applications

Instructors':

Dr Jinling Wang & Dr Yong Li, School of Surveying & Spatial Information Systems, The University of New South Wales, NSW, Australia

Instructors' Biographies:

Jinling Wang is a senior lecturer in the School of Surveying & Spatial Information System at the University of New South Wales. He is a member of the editorial board for the international journal GPS SOLUTIONS, and Chairman of the international study group on pseudolite applications in positioning and navigation within the International Association of Geodesy's Commission 4. He was 2004 President of the International Association of Chinese Professionals in Global Positioning Systems (CPGPS). He holds a PhD in GPS/Geodesy from Curtin University of Technology, Australia.

Yong Li is a Research Fellow at the School of Surveying & Spatial Information Systems, the University of New South Wales (UNSW). Yong obtained a Doctor of Philosophy in flight dynamics in 1997. From 2000 to 2002 he was a STA Fellow at the Japanese Aerospace Exploration Agency (JAXA, formerly the National Aerospace Laboratory). Yong worked at the Beijing Institute of Control Engineering for GPS space applications from 1997 to 2000. His current research interests include integration of GPS and INS, GPS receiver architectures, GPS-based attitude determination, and optimal estimation/filtering theory and applications.

Workshop Synopsis:

The integration of GPS and INS has been widely used for a variety of positioning, navigation, and geo-referencing applications, benefiting from the complementary characteristics of the two systems. Depending on type of applications and other factors, GPS/INS integration can be developed in three modes, i.e., loose, tight, and ultra-tight integrations. The integration Kalman filter is at the heart of integrated GPS/INS systems. The widely used integration Kalman filter is based on the INS error dynamic model, including both navigation states and sensor error states. Precise GPS measurements are used to estimate the INS errors and thus the calibrated INS can provide precise position, velocity and attitude information for the user platform.

This workshop will 1) introduce the principles of GPS and INS, including various coordinate frames used in GPS and INS; GPS/INS measurements and error sources; position/navigation solution computations; 2) discuss fundamentals of Kalman filter; GPS/INS integration strategies, system performance measures; and 3) demonstrate the operations of integrated GPS/INS systems through the real data analysis with both commercial system and in-house software packages developed at the University of New South Wales.





Wednesday 19 July 2006

0800 - 1700	Registration – Pre-function Area, Level 2
0900 - 1000	Session 1: The GNSS Global Perspective
0900 - 0915	Official Welcome Deputy Premier Anna Bligh (to be invited)
0915 - 1000	Current Operations and Future Developments in GPS Keith McPherson Manager GNSS, Airservices Australia, Canberra ACT, Australia
1000 - 1030	Morning Tea and Official Opening of Trade Exhibition – Tarcoola Ballroom, Level 4
1030 - 1230	Session 2: The GNSS Global Perspective continued
1030 - 1115	European Commission Galileo Update Bruno Julien Ambassador and Head of Delegation of the European Commission to Australia and New Zealand
1115 - 1200	Galileo at the Horizon: Compliment or Competition to GPS? Dr Guenter Hein Director, Institute of Geodesy and Navigation, University of FAF Munich
1200 - 1230	Galileo, A Global Civil Navigation Satellite System Developed Under a PPP Hans Peter Marchlewski General Councillor, Galileo Joint Undertaking, Brussels, Belgium
1230 - 1330	Lunch & Trade Exhibition – Tarcoola Ballroom, Level 4
1330 - 1500	Session 3: The GNSS Global Perspective continued
1330 - 1415	Current Operations and Future Developments in GLONASS Sergy Revniviikh Deputy Head for Mission Control GLONASS, Russia (invited)
1415 - 1500	GNSS Augmentation Using Quasi-Zenith Satellite System (QZSS) and it's benefits for Satellite Navigation Applications Susumu Yoshitomi Director, Japan Aerospace Exploration Agency, Tsukuba Ibaraki, Japan
1500 - 1530	Afternoon Tea & Trade Exhibition – Tarcoola Ballroom, Level 4
1530 - 1700	Session 4: The GNSS Australian Perspective
1530 - 1615	Galileo Business Opportunities in Australia Robert Lorimer Managing Partner, Position One Consulting, Brisbane Qld, Australia
1615 - 1700	Business to Business Matching Session Representative of Galileo Concessionaire (invited)
1700	Close of Sessions
1715 - 1815	IGNSS Welcome Reception – Tarcoola Ballroom, Level 4 <i>Proudly Sponsored by CR Kennedy Total Surveying Solutions</i>

The organising committee and IGNS Society reserve the right to change the preliminary program without notice

Thursday 20 July 2006

0830 - 1700	Registration – Pre-function Area, Level 2
0900 - 1030	Session 5: Linking International GNSS to Australian GNSS
0900 - 0930	An Overview of GNSS Related Organisations in Australia Robert Lorimer Managing Partner, Position One Consulting, Brisbane Qld, Australia
0930 - 1000	The Proposed Australian Galileo Test Bed & Overview of the Australian Galileo Joint Undertaking (AGJU) Werner Enderle Professor, Australian GNSS Joint Undertaking (AGJU), Queensland University of Technology (QUT), Brisbane Qld, Australia
1000 - 1030	The Establishment of the New International Committee on GNSS (ICG) Matt Higgins Principal Survey Advisor, Department of Natural Resources, Mines and Water, Brisbane Qld, Australia

1030 - 1100 Morning Tea & Trade Exhibition – Tarcoola Ballroom, Level 4

CONCURRENT SESSIONS

1100 - 1230	Session 6A: Space/ Ground Based Augmentation	Session 6B: Integrated Systems
1100 - 1130	Implementation of Prototype Satellite Based Augmentation System (SBAS) (60) T Sakai Electric Navigation Research Institute, Tokyo, Japan	Time Synchronization Analysis of an FPGA based GPS/INS Integrated System (28) Y Li School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia
1130 - 1200	Remonte Control System for the Quasi-Zenith Satellite Crystal Oscillator Based on the Two-Way Time Transfer Method (39) F Tappero AIST, Japan	Stochastic Modelling Strategies in GPS/INS Data Fusion Process (35) W Ding School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia
1200 - 1230	Sparse or Dense: Challenges of Australian Network RT (80) K Zhang Professor, Mathematical & Geospatial Sciences, RMIT University, Melbourne Vic, Australia	Performance Analysis of the Ultra-Tight GPS/INS Integration Based on an Improved Kalman Filter Design for Tracking Loops (38) D Li School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia

1230 - 1330 Lunch & Trade Exhibition – Tarcoola Ballroom, Level 4

1330 - 1500	Session 7A: Space/ Ground Based Augmentation	Session 7B: Integrated Systems <i>Proudly sponsored by QLD Government</i>
1330 - 1400	A Regional Galileo Integrity Concept for Australasia (72) W Enderle Professor, Co-Operative Research Centre for Satellite Systems, Queensland University of Technology, Brisbane Qld, Australia	GPS to Improve the Safe Operation of Vehicles (17) R Lorimer Managing Partner, Position One Consulting, Brisbane Qld, Australia
1400 - 1430	Wide Area Carrier Phase Positioning – Comparison of the Two Alternate Methods (29) M Bannister OmniSTAR Pty Ltd., West Perth WA, Australia	Error analysis of an Integrated Inertial Navigation System & pSLAM (pseudoSLAM) During GPS Outages (21) L Connolly Advanced Information Processing, British Aerospace (BAE) Systems, Bristol, United Kingdom
1430 - 1500	An Investigation of CORS Networks for Western Australia (48) G Hu Doctor, Western Australian Centre for Geodesy, Curtin University of Technology, Perth WA, Australia.	A Time-Synchronization Device for Tightly Coupled GPS/INS Integration (5) P Mumford School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia

1500 - 1530 Afternoon Tea & Trade Exhibition – Tarcoola Ballroom, Level 4

1530 - 1700	Session 8A: Space/ Ground Based Augmentation	Session 8B: Integrated Systems
1530 - 1600	Exploring GNSS Performance Benefits from Multiple Satellite Systems & Multiple Carrier Signals using existing GPS Constellation & Measurements (76) Y Feng CRC for Satellite Systems, Queensland University of Technology, Brisbane Qld, Australia	E-Trakka a fully integrated GPS System to assist with Horse Training (82) P Oppenlander GPSat Systems Australia Pty Ltd., Macleod Vic, Australia
1600 - 1630	Temporal Variation of the Victorian GPSnet Base Stations (13) S Yousofi Mathematical & Geospatial Science, RMIT University, Melbourne Vic, Australia	Research on the Navigation-aids Information System based on 3G & Internet (10) X Zhang Professor, Navigation, Xiamen Fujian, China
1630 - 1700	An Adaptive Kalman Filter algorithm for Real Time Estimation of Receiver Clock in SBAS (44) R Gupta Flight Dynamics Division, ISRO, Karnataka, India.	Apply Neural Network for Airborne GPS/INS/PL Integration (54) J Wang School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia

1700 Close of Sessions

1715 - 1815 IGNSS Trade Cocktail Function – Tarcoola Ballroom, Level 4 *Proudly Sponsored by CR Kennedy Total Surveying Solutions*

0830 - 1700

0900 - 1030

0900 - 0930

0930 - 1000

1000 - 1030

Morning Tea & Trade Exhibition – Tarcoola Ballroom, Level 4

1030 - 1100

CONCURRENT SESSIONS

Session 6C: Aviation Applications

Beta GBAS Category I Installation and Certification in Australia? Lessons Learned (19)
K McPherson Manager GNSS, Airservices Australia, Canberra ACT, Australia

RNP and GLS - Qantas In-Service Experience
Captain A Passerini Technical Pilot Boeing Fleets, Qantas Airways, Australia

The Use of GNSS for Aviation in Australia (66)
J Woods Civil Aviation Safety Authority, Canberra ACT, Australia

Session 6D: Positioning

GNSS Data Protocols: Choice and Implementation (26)
TS Yan School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia

Estimation of Ionospheric Delays in Dual Frequency Positioning (18)
H Isshiki Institute of Mathematical Analysis (IMA), Osaka, Japan

A New Algorithm of Ambiguity Resolution On-the-Fly for Medium Range GPS Kinematic Positioning (83)
W Tang Doctor, Wuhan University, Wuhan Hubei, China

1100 - 1230

1100 - 1130

1130 - 1200

1200 - 1230

Lunch & Trade Exhibition – Tarcoola Ballroom, Level 4

1230 - 1330

Session 7C: Aviation Applications/ Navigation Systems

A New Receiver Autonomous Integrity Monitoring Strategy for Multi-Fault Exclusion using GPS and Galileo Constellations (75)
Y Feng Doctor, CRC for Satellite Systems, Queensland University of Technology, Brisbane Qld, Australia

Airborne GPS Navigation with Miniature Atomic Clock – Simulation Results (46)
T Bruggemann Engineering Systems, Queensland University of Technology, Brisbane Qld, Australia

Test and Integration of Location Sensors for Position Determination in a Pedestrian Navigation System (4)
G Retscher Doctor, Institute of Geodesy & Geophysics, Vienna University of Technology, Vienna, Austria

Session 7D: Mapping
Proudly sponsored by Topcon Australia

Integration of GPS and GIS in Bicycle Trail Planning (25)
J Blachowski Doctor, Institute of Mining Engineering, Wroclaw University of Technology, Wroclaw, Poland

Geographic Information Mapping for Email Services (97)
J Zhang Computer Science & Mathematics, Victoria University, Melbourne Vic, Australia

Low Cost Sub-Meter Accuracy anytime, anywhere (94)
R Lorimer Managing Partner, Position One Consulting, Brisbane Qld, Australia

1330 - 1500

1330 - 1400

1400 - 1430

1430 - 1500

Afternoon Tea & Trade Exhibition – Tarcoola Ballroom, Level 4

1500 - 1530

Session 8C: Aviation Applications
Proudly sponsored by Australian Research Centre for Aerospace Automation

Ground-based Regional Augmentation System (GRAS) (20)
K McPherson Manager GNSS, Airservices Australia, Canberra ACT, Australia

Simulation Results for High-Performance Navigation System Utilising the Ground Based Regional Augmentation System for General Aviation Aircraft (52)
D Greer Faculty of Built Environment & Engineering, Queensland University of Technology, Brisbane Qld, Australia

GPS Based Attitude Estimation of Aircraft Using Artificial Neural Network Aided Extended Kalman Filter (2)
R Katoch Aerospace Engineering, Indian Institute of Science, Bangalore Karnataka, India

Session 8D: Surveying
Proudly sponsored by Topcon Australia

High-Precision Real-Time Networks: Successful Development Models (87)
G Schrock Washington State Reference Network, Seattle Public Utilities, Seattle WA, USA

Development of a Low-Cost and Near Real-Time GPS-Based Deformation Monitoring System (89)
H Setan Professor, Geomatic Engineering, Universiti Teknologi Malaysia (UTM), Johor, Malaysia

An Investigation of Precise Point RTK Positioning Application for Airborne Geophysical Survey (36)
F Wu Doctor, Department of Geospatial Science, RMIT University, Melbourne Vic, Australia

1530 - 1700

1530 - 1600

1600 - 1630

1630 - 1700

Close of Sessions

1700

IGNSS Trade Cocktail Function – Tarcoola Ballroom, Level 4

Proudly Sponsored by CR Kennedy Total Surveying Solutions

1715 - 1815



Friday 21 July 2006

0830 - 1700	Registration – Pre-function Area, Level 2	
0900 - 1030	Session 9A: Space/ Ground Based Augmentation Proudly Sponsored by QLD Government	Session 9B: Integrated System/ Receiver Technology
0900 - 0930	Validating a CORS Network Management Model Using A Case Study (7) M Hale Geomatics, The University of Melbourne, Melbourne Vic, Australia	IMU Aided Multi-Antenna GPS Receiver for Attitude Determination (23) J Lorga Faculty of Aerospace Engineering, Delft University of Technology, Delft, Netherlands
0930 - 1000	SunPOZ : Enabling Centimetre Accuracy GNSS Applications in Queensland (100) G Cislowski Senior Surveyor, Department of Natural Resources, Mines and Water, Brisbane Qld, Australia	An Architecture for Satellite Navigation Signal Simulation (90) X Yao Institute for Automation, National University of Defense Technology, Changsha, Hunan, China
1000 - 1030	Economical DGPS for Spade width Accuracy (27) P Terrett Rapid Map Australia, Bundoora Vic, Australia	An Open GNSS Receiver Research Platform (6) P Mumford School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia
1030 - 1100	Morning Tea & Trade Exhibition – Tarcoola Ballroom, Level 4	
1100 - 1230	Session 10A: Space/ Ground Based Augmentation	Session 10B: Receiver Technology
1100 - 1130	Improved Mining Navigation via Pseudolites (70) W Enderle Professor, Australian GNSS Joint Undertaking (AGJU), Queensland University of Technology (QUT), Brisbane Qld, Australia	Sampling and Jitter Considerations for GNSS Software Receivers (64) A Dempster School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia
1130 - 1200	Regional GNSS Satellite Orbit Monitoring for Improved Real Time Zenith Tropospheric Delay Estimations (77) Y Zheng Engineering Systems, Queensland University of Technology, Brisbane Qld, Australia	Improving Signal Quality in FPGA Based GPS Receiver Designs (59) K Parkinson School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia
1200 - 1230	System Operations Concepts of Regional Positioning using Japanese Quasi Zenith Satellite System (50) T Ono Satellite Navigation and Positioning System Division, NEC TOSHIBA Space Systems Ltd., Tokyo, Japan	Direct GPS P-code Acquisition Method Based on FPGA (78) H Li Electronic Engineering, Tsinghua University, Beijing, China
1230 - 1330	Lunch & Trade Exhibition – Tarcoola Ballroom, Level 4	
1330 - 1500	Session 11A: Space/ Ground Based Augmentation & Locata	Session 11B: Receiver Technology
1330 - 1400	GEMS - GNSS Environment Monitoring System (81) A Mallia GPSat Systems Australia Pty Ltd, Macleod Vic, Australia	Mapping of Multioperable GNSS Receiver Algorithms to a Heterogeneous ASIP Based Platform (62) G Kappen Chair of Electrical Engineering and Computer Systems, RWTH, Aachen NRW, Germany
1400 - 1430	Locata: A New Positioning Technology for Classically Difficult GNSS Environments (12) J Barnes Doctor, School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	FFT Based Acquisition Algorithm in a Multi-Frequency Software Receiver (58) A Sicramaz Ayaz Geodesy and Navigation, University of FAF-Munich, Munich, Germany
1430 - 1500	Network Design and Management related to LocataNet Installations (14) A Pahwa School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	Phase Adaptive Integration for GNSS Signals (73) Z Qin Nokia Corporation, Tampere, Finland
1500 - 1530	Afternoon Tea & Trade Exhibition – Tarcoola, Ballroom, Level 4	
1530 - 1700	Session 12A: Telematics & Timing	Session 12B: Geodesy
1530 - 1600	Relativistic GPS and Quantum Approaches to Clock Synchronization. How these could be combined? (95) A Da Silva Louisiana State University, Baton Rouge LA, United States	Plate Motions Determined by CGPS in South Pacific Region (45) M Jia Geoscience Australia, Canberra ACT, Australia
1600 - 1630	A Privacy Preserving GPS-based Pay-as-You-Drive Insurance Scheme (31) M Iqbal School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	The Australian Regional GPS Network Real time and Beyond (65) M Moore Geoscience Australia, Canberra ACT, Australia
1630 - 1700	Design of Tools and Plan for Remote Synchronization System for Quasi-Zenith Satellites (8) T Iwata National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki, Japan	Atmospheric Bias Interpolation for Network RTK GPS (32) P Grgich The University of Melbourne, Melbourne Vic, Australia
1700 - 1705	IGNSS Awards & Closing Ceremony	



Friday 21 July 2006

Registration – Pre-function Area, Level 2		0830 - 1700
Session 9C: Navigation Systems & Applications/ Other	Session 9D: Inertial Systems/ Special Applications	0900 - 1030
Engineering the Next Generation USCG Differential GPS Architecture (16) D Wolfe Command & Control Engineering Center, United States Coast Guard, Portsmouth VA, USA	Meeting the Contemporary Position and Navigation Needs of Precision Farming In Victoria Using The GPSnet™ CORS Network (41) J Denham Geospatial Information, RMIT University, Melbourne Vic, Australia	0900 - 0930
High Fidelity 3-D Urban Model-Based Signal Performance Simulation of the Current and Future GNSSs in Australia (84) G Liu Professor, Mathematical and Geospatial Sciences, RMIT University, Melbourne Vic, Australia	Reducing Cross-correlation Effects of Pulsed Direct-Sequence-Spread-Spectrum Positioning Signals by Blanking (37) M Kanli The University of New South Wales, Sydney, New South Wales, Australia	0930 - 1000
Testing and Evaluation of a GPS CORS Network for Real Time Centimetric Positioning – The Victoria GPSnet™ Case Study (9) C Gordini Doctor, Department of Geomatics-The University of Melbourne, Melbourne, Victoria, Australia	Carrier Phase and Pseudorange Based GPS/INS Integrated Navigation System for Land Vehicles (91) M Nishiyama Electrical & Electronic Engineering, Ritsumeikan University, Kusatsu Shiga, Japan	1000 - 1030
Morning Tea & Trade Exhibition – Tarcoola Ballroom, Level 4		1030 - 1100
Session 10C: Navigation Systems & Applications / Other	Session 10D: Signal Interference & Multipath	1100 - 1230
Identifying Surface Strike-Slip Pattern after the 2001 Bhuj Earthquake Using GPS (67) M Kulkarni Civil Engineering, Indian Institute of Technology Bombay, Mumbai Maharashtra, India	An application of Post-Correlation GPS Receiver Interference Detection and Characterization (30) A Tabatabaei Balaei School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	1100 - 1130
Processing GPS Data for Travel Surveys (11) C FitzGerald Institute of Transport & Logistics Studies, University of Sydney, Sydney NSW, Australia	Experimental Evaluation of a Dual Polarized Patch Antenna Array (42) M Trinkle Electrical/ Electronic Department, Adelaide University, Adelaide SA, Australia	1130 - 1200
Mitigation of Distance - Dependent Errors for GPS Network Positioning (15) S Lim School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	The Effectiveness of GPS Multipath Mitigation Techniques on BOC Signals (43) A Dempster Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	1200 - 1230
Lunch & Trade Exhibition – Tarcoola Ballroom, Level 4		1230 - 1330
Session 11C: Location Based Services	Session 11D: Signal Interference & Multipath	1330 - 1500
Positioning Case Studies Using RFID and GNSS: Indoor and Outdoor (85) G Retscher Institute of Geodesy and Geophysics, Vienna University of Technology, Vienna, Austria	Code-Carrier Phase Smoothing via the Least Squares Observation Equations Model (47) R Fraser Department of Natural Resources and Mines, Brisbane Qld, Australia	1330 - 1400
Wireless Signal Map Matching for NLOS Error Mitigation in Mobile Phone Positioning (51) B Li School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	An Analysis of the Temporal Correlation of the Ionospheric Bias Affecting GPS Carrier Phase (79) S Wyllie Geospatial Science, RMIT University, Melbourne Vic, Australia	1400 - 1430
Pseudolite-augmented Precise Positioning System for Vessel Berthing (55) S Hyun Park Maritime & Ocean Engineering Research Institute, Daejeon, Korea, South	Development and Validation of a Multipath Model in Semi-Urban, Aircraft, and Shipboard Environments (98) J Weiss University of Colorado, Boulder CO, USA	1430 - 1500
Afternoon Tea & Trade Exhibition – Tarcoola Ballroom, Level 4		1500 - 1530
Session 12C: Special Applications	Session 12D: GNSS Regulation / Education & Other	1530 - 1700
A-GPS for Firefighting (40) A Dempster School of Surveying & Spatial Information Systems, The University of New South Wales, Sydney NSW, Australia	The Australian GNSS Joint Undertaking (AGJU) Concept & Objectives (71) W Enderle Professor, Australian GNSS Joint Undertaking (AGJU), Queensland University of Technology (QUT), Brisbane Qld, Australia	1530 - 1600
GPS Deflection Monitoring of West Gate Bridge, Melbourne (53) N Raziq Department of Geomatics, The University of Melbourne, Melbourne Vic, Australia	Regulating GNSS - Present Strategy, Future Challenges (33) A Kerans Australian Communications Authority, Canberra ACT, Australia	1600 - 1630
An analysis of the position calculation accuracy for GPS status aiding of an A-GPS server (88) N Harper Andrew Network Solutions Asia-Pacific, Wollongong NSW, Australia	Paradigm Shift in GNSS Education for Asia Pacific Nations (96) A Hassan Doctor, Universiti Teknologi Malaysia Kuala Lumpur, Malaysia	1630 - 1700
IGNSS Awards & Closing Ceremony		1700 - 1705

Posters

Posters can be viewed during the symposium. Authors will be available for questions during the symposium. Times for poster questions will be advised during the symposium.

Improving of Cycle-slip Detection and Correction of Blewitt Method (1)

Z Zheng Doctor, Shandong University of Science and Technology, QingDao, China

Application of Fuzzy Logic Model for Designing a DGPS Reference Network in Iran (63)

A Ardalan Professor, Department of Surveying and Geomatics Eng., University of Tehran, Tehran, Iran

Planning, Navigation and Control of Water and Soil Sample Points Aiming the Geoenvironmental Diagnosis of Castelo River Watershed Using Geodesic GPS, Orbital Imagery and Geoprocessing (3)

R Castro Junior Professor, Universidade Federal do Espírito Santo, Vitória, Espírito Santo, Brazil

Evaluation of the Effects of the Observation Weight Matrix on the Ambiguity Resolution in LAMBDA Method (86)

S Hoseini University of Tehran, Tehran, Iran

Monitoring of Ground Surface Changes Following the End of Mining with Satellite GPS Technique (24)

S Cacon Doctor, Wroclaw University of Agriculture, Department of Geodesy and Photogrammetry, Wroclaw, Poland

Precise Point Positioning based on GR Models - Further Results in Single Frequency Applications (92)

S Fujita Electrical & Electronic Engineering, Ritsumeika University, Kusatsu Shiga, Japan

An Evaluation of High Output Rate Single Frequency GPS Receivers (34)

F Wu Doctor, RMIT University, Melbourne Vic, Australia

Detection of Abnormal Pseudorange and Carrier Phase Measurements in GPS Precise Point Positioning (93)

M Nishiyama Electrical & Electronic Engineering, Ritsumeikan University, Kusatsu Shiga, Japan

Registration Fees & Payment

To attend the Symposium, please complete the registration form and return it to the IGNSS Society. Each delegate must fill in a separate form. This form may be photocopied or downloaded from the IGNSS website. Please read the registration brochure carefully before completing the form. Forms will be accepted by post or fax.

Early bird registration closes at 5:00pm Wednesday 31 May 2006.

Members of the IGNSS Society and AIAA members are entitled to the discounted registration fee. (*Note registrations are for individuals only and cannot be shared.*)

Registration Type	Early bird By 31 May 2006	Standard After 31 May 2006
Full Registration - #Member	\$695	\$795
Full Registration - Non Member	\$795	\$895
Full Registration - Student	\$445	\$495
(This student rate is only offered to full time students. A copy of your full time student/ concession card must accompany your registration)		
Day Registration - Wednesday	\$345	\$445
Day Registration - Thursday	\$345	\$445
Day Registration - Friday	\$345	\$445

All delegates will be issued with a name badge on arrival at the Symposium. Delegates must wear their name badge at all times to attend the sessions.

All prices quoted in this brochure are in Australian dollars and are inclusive of GST (unless otherwise stated). Registrations will not be processed until payment is received. Payment can be made by the following methods:

- Credit card – Visa, MasterCard or Bankcard.
- Cheque
 - Australian delegates: personal or company cheques made payable to "IGNSS Society Inc".
 - International delegates: bank draft or international money order in Australian dollars drawn on an Australian bank and made payable to "IGNSS Society Inc".

Confirmation of Registration

On receipt of your registration and payment, a confirmation letter will be sent to you by e-mail unless otherwise indicated on the registration form. Please check your confirmation letter and advise of any changes in writing immediately, preferably by e-mail. A GST tax invoice for registration fees and social functions will be forwarded to you with your confirmation letter.

Cancellations and Refunds

Registration cancellations will not be accepted unless made in writing. Cancellations made prior to 17 June 2006 will be refunded less a \$125 administrative fee. No registration refunds will be made after this date. As an alternative to cancellation, your registration may be transferred to another person without incurring any penalty. The IGNSS Society must be advised of this transfer in writing.

Entitlements

Full delegate registration for members, non-members and students include:

- Attendance at CGSIC meeting Monday 17 July
- Attendance at all symposium sessions from Wednesday 19 July - Friday 21 July
- All symposium day catering
- Welcome reception
- Trade Cocktail Function
- Symposium satchel & handbook
- CD of proceedings (distributed after the symposium)
- Entry to trade exhibition
- #Delegate list

Day delegate registration include:

- Attendance to sessions for nominated day
- Symposium day catering for nominated day
- Symposium social function for nominated day (only for Wednesday & Thursday day delegates)
- Symposium satchel & handbook
- CD of proceedings (distributed after the symposium)
- Entry to trade exhibition for nominated day
- #Delegate list

#Due to new privacy laws, delegate lists include only name and organisation. If you do not wish to be included in this list, please tick the appropriate box on the registration form.



Please complete and send this form to IGNSS Society, PO Box 1237, Milton QLD 4064, AUSTRALIA or fax to +61 7 3371 0555. To qualify for early bird rates, full payment must be received by no later than the 31 May 2006.

Personal Details

Title _____ Surname _____ Given Name _____
 Organisation _____ Position _____
 Postal Address _____
 Suburb _____ State _____ Post Code _____ Country _____
 Phone () _____ Fax () _____
 Email _____ (confirmation will be sent to this email address)
 Preferred name on badge _____
 Dietary/Special Requirements _____

Please indicate by ticking the boxes below if you:

- do not wish to be included on the symposium delegate list. require a letter to apply for a Visa to enter Australia
- The delegate list will be given to all participants at IGNSS 2006.* require your confirmation letter to be posted to the address above instead of via email
- are a member of the IGNSS Society presenting author (indicate paper number): _____

CGSIC Meeting – Monday 17 July, 2006

Please indicate if you will be attending the CGSIC Meeting: R01 Complimentary

Pre-Symposium Workshops – Tuesday 18 July 2006

Workshops are not included in the symposium registration and are an additional cost.

Please indicate, which workshop/s you wish to attend:

- 09:00 – 12:00 **Workshop 1:** Design and Development of the European Satellite Navigation System Galileo
 Delegate (W1D) Non Delegate (W1N)
- 12:30 – 14:30 **Workshop 2:** Modelling and Real Time Simulation of GNSS Environmental Vulnerability Issues
 Delegate (W2D) Non Delegate (W2N)
- Workshop 3:** Alternatives to GNSS for Outdoor & Indoor Positioning
 Delegate (W3D) Non Delegate (W3N)
- 14:45 – 16:45 **Workshop 4:** GBAS/ GRAS for Global Use in Aviation
 Delegate (W4D) Non Delegate (W4N)
- Workshop 5:** Integration of GPS & INS - Principle, Implementation & Applications
 Delegate (W5D) Non Delegate (W5N)

Symposium Delegates:

2 hour workshops _____ @ \$195 per workshop **Total: \$ _____**
 3 hour workshop _____ @ \$295 per workshop **Total: \$ _____**

Non-Symposium Delegates:

2 hour workshops _____ @ \$295 per workshop **Total: \$ _____**
 3 hour workshop _____ @ \$395 per workshop **Total: \$ _____**
Workshop Total: \$ _____

Symposium Registration

Payment must be received by 5pm on 31 May 2006 to qualify for early bird rate.

(AIAA Members are entitled to register at the IGNSS Member rate).

	Early bird By 31 May 2006	Standard After 31 May 2006
Full Registration - # Member	R02 <input type="checkbox"/> \$695	R03 <input type="checkbox"/> \$795
Full Registration - Non Member	R04 <input type="checkbox"/> \$795	R05 <input type="checkbox"/> \$895
Full Registration – Student	R06 <input type="checkbox"/> \$445	R07 <input type="checkbox"/> \$495

(This student rate is only offered to full time students. A copy of your full time student/ concession card must accompany your registration)

Day Registration - Wednesday	R08 <input type="checkbox"/> \$345	R09 <input type="checkbox"/> \$445
Day Registration - Thursday	R10 <input type="checkbox"/> \$345	R11 <input type="checkbox"/> \$445
Day Registration - Friday	R12 <input type="checkbox"/> \$345	R13 <input type="checkbox"/> \$445

Registration Total: \$ _____

*Speakers who do not register by early bird will be excluded from the program. # Member of IGNSS Society

Surname: _____

Given Name: _____

Social Functions

Welcome Reception – Wednesday 19 July 2006 (Inclusive for fully registered delegates & Wednesday day delegates)

Please indicate if you will be attending Yes No

Extra Tickets _____ @ \$45.00 each

Guest Names _____

Trade Cocktail Function – Thursday 20 July 2006 (Inclusive for fully registered delegates & Thursday day delegates)

Please indicate if you will be attending Yes No

Extra Tickets _____ @ 45.00 each

Guest Names _____

Functions Total: \$ _____

Accommodation

Prices quoted are for a maximum of 2 people per room, per night.

Holiday Inn Surfers Paradise

- | | | |
|--------------------------|-------------------------------|----------|
| <input type="checkbox"/> | A01 Ocean View Room | \$140.00 |
| <input type="checkbox"/> | including one full breakfast | \$155.00 |
| <input type="checkbox"/> | including two full breakfasts | \$170.00 |
| <input type="checkbox"/> | additional person | \$45.00 |

Arrival Date ____/____/____ **Departure Date** ____/____/____ **No. of Days** _____Room type required – please indicate Single Twin Double

Sharing with: _____

Special requests: _____

Any changes to or cancellations of accommodation reservations made via this form must be notified to the IGNSS Society in writing and not directly to the accommodation venue.

Payment Summary

Pre-Symposium Workshops	\$ _____
Symposium Registration	\$ _____
Social Functions	\$ _____
IGNSS 2006 registration total	\$ _____
Accommodation total	\$ _____
Grand Total	\$ _____

 Cheque made payable to "IGNSS Society Inc" enclosed Credit card details below

Credit Card Authority – Registration Only

Debits to your credit card will appear on your statement as Sharnay Pty Ltd trading as Organisers Australia. By signing below, the cardholder authorises the registration total to be debited from the following credit card

 Bankcard **MasterCard** **Visa**

Card No. _____ Expiry Date _____ Verification No. _____

Cardholder Name _____ Signature _____

Credit Card Authority – Accommodation Only

The hotel will make debits to your credit card. By signing below, the cardholder authorises the hotel to debit the credit card for the following:

- | | | |
|---|--|--|
| <input type="checkbox"/> 1 night security deposit | <input type="checkbox"/> All accommodation | <input type="checkbox"/> All accommodation & breakfast |
| <input type="checkbox"/> All accommodation, breakfast & incidentals | <input type="checkbox"/> Other | |

 Amex **Diners** **Bankcard** **MasterCard** **Visa**

Card No. _____ Expiry Date _____ Verification No. _____

Cardholder Name _____ Signature _____

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Asia: +65-63482212

China: +86-10-88577575

Email: trimble_support@trimble.com

Social program

The social functions planned are inclusive for full symposium delegates. Delegates who do not wish to attend will not be given a discount on their registration fee as these functions are subsidised by the IGNS Society.

Welcome Reception

Wednesday 19 July 2006

5:15pm – 6:15pm

Holiday Inn Surfers Paradise, Tarcoola Ballroom, Level 4

Inclusive for full symposium delegates & Wednesday day delegates.

Additional tickets \$45.00 each

Trade Cocktail Function

Thursday 20 July 2006

5:15pm – 6:15pm

Holiday Inn Surfers Paradise, Tarcoola Ballroom, Level 4

Inclusive for full symposium delegates & Thursday day delegates.

Additional tickets \$45.00 each

Catch up with old colleagues and meet new ones as you relax with a drink and enjoy mouth-watering canapes. Watch the sunset from the North Terrace balcony and then party on afterwards at the many bars and restaurants in Surfers Paradise.

General Information

Registration Desk

Opening hours:

Tuesday 18 July 2006 8:30am to 5:00pm

Wednesday 19 July 2006 8:00am to 5:00pm

Thursday 20 July 2006 8:30am to 5:00pm

Friday 21 July 2006 8:30am to 5:00pm

The Location

The Gold Coast is one of the world's premier tourist destinations for one very good reason – there is so much to do. With protected waterways, rock pools for safe swimming and golden sandy beaches for long walks, action packed theme parks, wildlife sanctuaries, championship golf courses, fabulous shopping and rainforest hinterland, it really is the coast with the most.

The Venue

The Holiday Inn Surfers Paradise is perfectly located in the heart of Australia's most popular resort destination, surrounded by chic boutiques, al fresco dining, and lively entertainment and just 50 metres from the magnificent Surfers Paradise beach.

Privacy Statement

Your personal registration details will only be used for the purpose of managing this symposium. We will not disclose your personal details to any other party.

Only your name and organisation will appear on a list of attendees that will be available to all attendees, to assist with networking and communication at the symposium. Please indicate on the registration form if you do not want the information above included on the delegate list.

Special needs

Every effort is made to cater for people with special needs. Should you require any specific assistance, including dietary requirements or wheelchair access, please include this in the relevant section of the registration form.

Personal Insurance & Liability

Participants shall be regarded in every aspect as carrying their own risk for personal injury and loss or injury to property, including baggage, during the symposium. We strongly recommend that you take out a travel insurance policy at the time of booking your registration and travel. The organisers will be in no way responsible for any claims concerning insurance.

In the event of industrial disruptions or force majeure, the IGNS Society and organising committee accept no responsibility for losses incurred by delegates and/or partners.

The program is correct at the time of publication and may change. Please refer to the IGNS website www.ignss.org for any changes. The IGNS Society and organising committee accept no liability for any speakers' published material or presentations at the symposium.

Travel and Accommodation

Travel

Corporate Travel Management (CTM) has been appointed the official travel agency for IGNS 2006. CTM is a "one stop shop" airfare booking service into the Gold Coast – they can also arrange your travel insurance. CTM will advise the best fare availability and conditions of purchase at the time of making your booking. To ensure the best possible airfare, delegates are urged to book early by contacting CTM toll free on 1 800 630 866, via e-mail at groups@travelctm.com or via the website at <http://www.travelctm.com/enq/IGNSS2006.htm> and quote the symposium code "IGNSS2006".

Airport Transfers

Gold Coast Con-X-ion offers direct transfers from both the Brisbane and Gold Coast airports to the Holiday Inn Surfers Paradise. Please contact them on +61 7 5556 9888 or log onto www.con-x-ion.com to arrange your airport transfers.

Accommodation

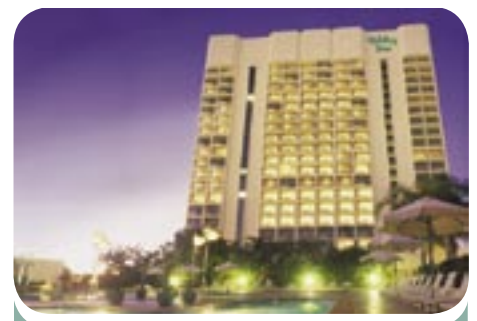
In order to secure a reservation, all accommodation bookings must be accompanied by a minimum deposit of one night's room rate. The deposit is non-refundable and will be forfeited if you do not arrive on the date for which you have booked. If payment is to be made by cheque, please make cheque payable to "IGNSS Society Inc". If payment is made by credit card, the details, including cardholder's signature, will be forwarded to your chosen accommodation venue as security for your booking. Delegates are responsible for any damage they inflict and must settle the balance of their account with the accommodation venue.

All rooms will be released from sale on 17 June 2006. The IGNS Society will accept accommodation bookings after 17 June 2006 but is unable to guarantee that accommodation will be available at the Holiday Inn Surfers Paradise or at the printed room rates.

Holiday Inn Surfers Paradise

The Holiday Inn Surfers Paradise creates an oasis of peace and tranquility amidst the chic bustle of Australia's most famous resort. With all rooms featuring private balconies with panoramic views of the Pacific Ocean access to the Gold Coast Hinterland, it will be hard not looking out in the morning at a perfect sunrise over the ocean or late in the afternoon as the sun sets behind the hinterland.

Every room is furnished with all the quality appointments you would expect. The hotel also features a health and beauty club, restaurants, café and bar. Maximum 3 persons only per room are permitted.



Ocean View (room only)

\$140.00 per room per night

Including one full breakfast

\$155.00 per room per night

Including two full breakfasts

\$170.00 per room per night

Additional person

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Program at a Glance

Monday 17 July 2006

0900 - 1700 **CGSIC Meeting**

Tuesday 18 July 2006

Pre-Symposium Workshops

0900 - 1200 Workshop 1:
Design and Development of the European Satellite Navigation System Galileo
Dr Guenter Hein Director, Institute of Geodesy & Navigation, University FAF Munich, Germany

1200 – 1230 Lunch

1230 – 1430 Workshop 2:
Modelling and Real Time Simulation of GNSS Environmental
Vulnerability Issues
Graeme Hooper Managing Director & **Joe Fleming**
Software Manager, GPSat Systems Australia, Vic, Australia

OR

Workshop 3:
Alternatives to GNSS for outdoor & indoor positioning
Dr Joel Barnes School Of Surveying & Spatial Information
Systems, The University of New South Wales, NSW, Australia

1430 – 1445 Afternoon Tea

1445 - 1645 Workshop 4:
GBAS/ GRAS for Global Use in Aviation
Keith McPherson Manager GNSS,
Airservices Australia, ACT, Australia

OR

Workshop 5:
Integration of GPS & INS - Principle, Implementation & Applications
Dr Jinling Wang & **Dr Yong Li** School of Surveying & Spatial
Information Systems, The University of New South Wales, NSW, Australia

Wednesday 19 July 2006

0900 - 0915 **Official Welcome** – Deputy Premier Anna Bligh (to be invited)

0915 - 1000 **The GNSS Global Perspective**
Keith McPherson

1000 – 1030 Morning tea and opening of trade exhibition

1030 - 1230 **The GNSS Global Perspective continued**
• Bruno Julien
• Guenter Hein
• Hans Peter Marchlewski

1230 - 1330 Lunch and trade exhibition

1330 - 1500 **The GNSS Global Perspective continued**
• Sergy Revnigiykh (invited)
• S Yoshitomi

1500 - 1530 Afternoon tea and exhibition

1530 - 1700 **The GNSS Australian Perspective**
• Rob Lorimer
• Representative of the Galileo Concessionaire (invited)

1715 - 1815 Welcome reception – Tarcoola Ballroom, Level 4

Thursday 20 July 2006

0900 – 1030 **The GNSS Australian Perspective**
• Rob Lorimer
• Werner Enderle
• Matt Higgins

1030 - 1100 Morning tea and trade exhibition

CONCURRENT SESSIONS

1100 - 1230	Space & Ground Augmentation	Integrated Systems	Aviation Applications	Positioning
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1230 - 1330 Lunch and trade exhibition

1330 – 1500	Space & Ground Augmentation	Integrated Systems	Aviation & Navigation Applications	Mapping
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1500 - 1530 Afternoon tea and trade exhibition

1530 – 1700	Space & Ground Augmentation	Integrated Systems	Aviation Applications	Surveying
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1715 – 1815 Trade Cocktail Function – Tarcoola Ballroom, Level 4

Friday 21 July 2006

0900 – 1030	Space & Ground Augmentation	Integrated Systems & Receiver Technology	Navigation Systems & Applications/ Other	Inertial Systems & Special Applications
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1030 - 1100 Morning tea and trade exhibition

1100 – 1230	Space & Ground Augmentation	Receiver Technology	Navigation Systems & Applications/ Other	Signal Interface & Multipath
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1230 – 1330 Lunch and trade exhibition

1330 – 1500	Space & Ground Augmentation/Locata	Receiver Technology	Location Based Services	Signal Interface & Multipath
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1500 – 1530 Afternoon tea and close of trade exhibition

1530 – 1700	Telematics & Timing	Geodesy	Special Applications	GNSS Regulation/ Education/ Other
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1705 Symposium close