



# *International Committee on Global Navigation Satellite Systems*

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## *Asia Pacific Economic Cooperation GNSS Technological Innovation Summit*

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*Office of Space and Advanced Technology  
Bureau of Oceans, Environment and Science  
U.S. Department of State*



# *International Committee on Global Navigation Satellite Systems (ICG)*

- Emerged from 3rd UN Conference on the Exploration and Peaceful Uses of Outer Space July 1999
  - Promote the use of GNSS and its integration into infrastructures, particularly in developing countries
  - Encourage compatibility and interoperability among global and regional systems
- **Members** include:
  - GNSS providers (U.S., EU, Russia, China, India, Japan)
  - Other Member States of the United Nations (UAE, Malaysia)





# *ICG Associate Members & Observers*

- **Associate Members** -- International and regional organizations and associations dealing with GNSS services and applications
  - Office for Outer Space Affairs of the United Nations (UN-OOSA)<sup>1</sup>
  - Civil GPS Service Interface Committee (CGSIC)<sup>1</sup>
  - International Association of Geodesy (IAG)<sup>1</sup>
  - International Cartographic Association (ICA)<sup>1</sup>
  - International GNSS Service (IGS, formerly International GPS Service)<sup>1</sup>
  - International Society for Photogrammetry and Remote Sensing
  - International Earth Rotation and Reference Systems Service (IERS)<sup>1</sup>
  - International Federation of Surveyors (FIG)<sup>1</sup>
  - European Position Determination System (EUPOS)<sup>1</sup>
  - International Scientific Council (ICSU)<sup>1</sup>
  
- **Observers**
  - Committee on Space Research (COSPAR)<sup>1</sup>
  - International Office for Weights and Measures (BIPM)<sup>1</sup>
  - International Association of Institutes of Navigation (IAIN)<sup>1</sup>
  - International Union of Radio Science (URSI)<sup>1</sup>
  - International Telecommunications Union (ITU)<sup>1</sup>



## *2<sup>nd</sup> International Committee on Global Navigation Satellite Systems (ICG)*

- ICG-2 held in September in Bangalore, India
- Established **Providers Forum** to address common issues
- Began implementation of the ICG Work Plan within established working groups:
  - A. Interoperability and compatibility
  - B. Enhancement of performance of GNSS services
  - C. Information dissemination, education, outreach & coordination
  - D. Interaction with monitoring & reference station network organizations
- U.S. will host the 3rd ICG in December 2008, Russia will host in 2009



## *WG-A – Compatibility & Interoperability*

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- **Sergey Revnivykh, Co-chair – Russia**
- **David Turner, Co-chair – United States**
- **Work Plan:**
  - **Establishment of Providers Forum**
  - **Surveys and workshops focused on compatibility and interoperability of global, regional, and ground-based differential systems**
  - **Guidelines for broadcast of natural disaster alarms using GNSS**
  - **Support of mechanisms to detect and mitigate sources of electromagnetic interference (outside U.S.)**



## ***WG- B Enhancement of Performance of GNSS Services***

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- **Dr. Sudah Ravindran, co-chair – India**
- **Seth Gutman, co-chair – United States**
- **Work Plan**
  - Develop a reference document on models and algorithms for ionospheric and tropospheric corrections
  - Examine the problem of multipath and related mitigation actions affecting both GNSS systems and user receivers, especially for mobile receivers
  - Examine the extension of GNSS service to indoor applications



## *WG- C Information Dissemination*

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- Sharafat Gadimova, co-chair – ICG Secretariat
- Barbara Adde, co-chair – United States
- Work Plan
  - Public awareness of GNSS
    - Informational Portal
    - Regional Informational Centers
  - Greater coordination of press releases and events
    - GPS World, *Inside GNSS*, *High Frontier Journal*
  - Increase educational opportunities
    - Universities Curriculum
    - OOSA sponsored workshop, seminars
    - Compile student roster with APEC for learning opportunities



# *WG- D Regional Reference Systems and Monitoring Network*

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- **Co-chairs**
  - Matt Higgins, International Federation of Surveyors (FIG)
  - John Dow, International GNSS Service (IGS)
  - Ruth Neilan – International Association of Geodesy (IAG)
- **Work Plan**
  - Expansion of GNSS reference station networks into regions with little or no meteorological or geodetic information
  - Improved open international sharing of GNSS-derived data



## *ICG Providers Forum*

- Six space segment providers listed previously are members
- Purpose:
  - Focused discussions on **compatibility and interoperability**, encouraging development of complimentary systems
  - Exchange of detailed information on systems and service provision plans
  - Exchange views on ICG work plan and activities
- Consensus reached at the first meeting on general definitions for compatibility and interoperability
  - Including spectral separation between each system's authorized service signals and other systems' signals

<http://www.unoosa.org/oosa/en/SAP/gnss/icg.html>



## *Recent ICG Activities*

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- Planning meeting held February 18-19, 2008 in Vienna
  - Efforts well underway for ICG-3, to be hosted by the U.S. at NASA JPL/Cal Tech in Pasadena, Dec 08
- **Providers Forum** held on February 18 prior to the ICG planning meeting
  - Updates on systems development provided
  - U.S. urged continued use of the information exchange template and presented a draft Terms of Reference for the Forum
  - Views exchanged on ICG work plan and activities



## *Other Activities*

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- International Symposium on Equatorial Aeronomy - ISEA 12, May 23, 2008
- Africa Array Workshop, Johannesburg, June 17-18, 2008
- United Nations/Colombia/United States workshop on GNSS Applications, Medellin, 23 - 27 June 2008
- GNSS Experts Meeting in conjunction with the COSPAR annual meeting, Montreal, July 15-16, 2008
- **ICG-3, Pasadena, December 8-12, 2008**



# ICG-3 Week December 8-12, 2008

## Top Level Draft Agenda

	Sunday 12/7	Day-1 Monday 12/8	Day-2 Tuesday 12/9	Day-3 Wednesday 12/10	Day-4 Thursday 12/11	Day-5 Friday 12/12
<b>9 AM</b>		1 <sup>st</sup> Plenary Meeting- Attend by all Official Opening Invited speaker -Providers: status and future plans; -Present issues to be discussed in WG and ICG	Science & Hi-Tech Applications What's new	Working Groups Meetings all day - sequential, 1.5 hours each	2 <sup>nd</sup> Plenary Meeting - WGs present issues and table draft recommendations. to ICG	3 <sup>rd</sup> Plenary Meeting  Closing statements, actions, next meeting  -Adjourn Meeting at 12 – 12:30
<b>10:30 Break</b>		<a href="#">Picture</a>				<a href="#">Final Picture</a>
<b>~12:30 or 1:00 Lunch</b>		Mars Movie	<b>Exhibit Area</b>			No Lunch
<b>2 PM</b>	Organizer Tag up Onsite registr'n 4-6 PM	<b>Parallel sessions:</b> A. 1 <sup>st</sup> Providers Forum  B. WGs co-chairs/ &/ or groups) meet and finalize plan for WG mtg on Day-3 ===== JPL Tours, ...	Adjourn ~3PM ===== Tour of JPL, Caltech Seismo/GPS lab, Boeing or Lockheed Martin satellite facility, ...	Working Groups continue	2 <sup>nd</sup> Providers Forum session – finalize any decisions  AD-hoc Meetings =====  Tours/ free time	Media / Press Event
<b>3:30 Break</b>						
<b>Exhibit</b>		<b>10-20 Exhibits</b>	<b>10-20 Exhibits</b>	<b>10-20 Exhibits Close exhibits</b>		
<b>5:30 ~ 6 PM Adjourn</b>						
<b>Evening 6 PM</b>		Reception		7 PM Group Dinner		



## *Summary*

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- International cooperation is a critical element of national space-based PNT policy
- U.S. is actively engaged in bi-lateral, regional, and multi-lateral cooperation on space-based navigation issues
- The **ICG** and associated **Providers Forum** are invaluable venues for promoting GNSS applications and **compatibility/interoperability** among current and future systems



## *Contact Information*

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