



AGENDA

TENTH MEETING of the International Committee on Global Navigation Satellite Systems

Boulder, Colorado, United States of America

1 – 6 November 2015

Saturday, 31 October 2015

United States Positioning, Navigation, and Timing (PNT) Advisory Board Meeting

Invitation to all: The United States Positioning, Navigation and Timing (PNT) Advisory Board will hold its 16th meeting in Boulder immediately prior to the tenth meeting of the ICG on 30 - 31 October 2015. The meeting is open for public participation and ICG members and participants are invited and encouraged to attend. There will be limited opportunity for GNSS Providers to present to the Board. For more information on the PNT Advisory Board and its Agenda, please visit <http://www.gps.gov/governance/advisory/>

Venue: UCAR Center Green Auditorium, 3080 Center Green Drive, Boulder, Colorado 80301

Sunday, 01 November 2015

Venue: UCAR Center Green Auditorium, 3080 Center Green Drive, Boulder, Colorado 80301

12:00 – 18:00 On-site Registration

13:00 – 16:00 First Session of the Providers' Forum

Co-Chairs: Kenneth HODGKINS, United States and Pieter DE SMET, European Commission

16:00 – 18:00 Meeting with the Working Groups Co-Chairs

02 – 06 November 2015

International Committee on Global Navigation Satellite Systems

PLENARY SESSIONS

Monday, 02 November 2015

Venue: UCAR Center Green Auditorium, 3080 Center Green Drive, Boulder, Colorado 80301

08:00 – 18:00 On-site Registration

08:45 – 12:30 First Plenary Session of ICG

Chair: Kenneth HODGKINS, United States of America

Attended by all. The primary purpose is for the GNSS system and augmentation providers to present the status and future plans for their systems, and an opportunity for the ICG members, associate members and observers to provide updates on recent developments in their organizations and associations with regard to GNSS services and applications. All presenters will identify issues for discussion in the ICG plenary sessions and/or its working groups meetings

08:45 – 09:35 Welcome/Opening Remarks

Michael THOMPSON, President, University Corporation for Atmospheric Research (UCAR)

Jay LINDELL, Aerospace and Defense Industry Champion, Colorado Office of Economic Development and International Trade

Jane ROHR, Major General, U.S. Air Force Space Command

Bob KOLASKY, Deputy Assistant Secretary, U.S. Department of Homeland Security

Simonetta DI PIPPO, Director, United Nations Office for Outer Space Affairs

09:35 Adoption of Agenda

09:40 – 12:30 Providers System and Service Updates

09:40 The Policy and Status Update Global Positioning System (GPS), Harold MARTIN, *National Coordination Office for Space Based Position, Navigation and Timing*; Shawn BRENNAN, *GPS Directorate, U.S. Air Force*; and Deborah LAWRENCE, *Federal Aviation Administration (FAA)*

10:00 Global Navigation Satellite System (GLONASS) Programme Update, Sergey KARUTIN, *Russian Federal Space Agency (Roscosmos), Russian Federation*

10:20 Status Update on the European Satellite Navigation System (GALILEO), Philippe JEAN, *European Commission*

10:40 Status Update on the BeiDou Navigation Satellite System (BDS), Chengqi RAN, *China Satellite Navigation Office (CSNO), China*

11:00 – 11:20 *Coffee Break*

11:20 Status Update on the Indian Regional Navigation Satellite System (IRNSS) and the GPS aided GEO-Augmented Navigation System (GAGAN), Kaushikkumar Suryakant PARIKH, *Indian Space Research Organization (ISRO), India*

11:40 Status Update on the Quasi-Zenith Satellite System (QZSS), Hiromichi MORIYAMA, *Office of National Space Policy, Cabinet Office, Japan*

12:00 – 13:30 *Group photo/Lunch*

13:30 United States Positioning, Navigation and Timing (PNT) Advisory Board Meeting Recap

Brad PARKINSON, *Co-Chair of the United States PNT Advisory Board*

13:40 – 15:40 Presentations by Members, Associate Members and Observers on Matters of Interest to ICG

- 13:40 High Integrity Navigation Overlay Services For Railway Applications, Alberto TUOZZI and Alessandro NERI, *Italy*
- 13:55 Update on Galileo System Deployment Status and Recovery of Satellites in Non-Nominal Orbits, Rafael LUCAS, *European Space Agency*
- 14:10 Activities carried out in 2015 in the framework of the workplan of the ICG, Sharafat GADIMOVA, *United Nations Office for Outer Space Affairs*
- 14:25 The IGS Real-Time Service: A Spur to Innovation, Chris RIZOS, *International Association of Geodesy*
- 14:40 EUREF activities, Markku POUTANEN, *Reference Frame Sub Commission for Europe*
- 14:55 Stephen R. HAMILTON, *Civil GPS Service Interface Committee*
- 15:10 Building Capacity in the use of GNSS, Sergio CAMACHO, *Regional Centre for Space Science and Technology Education for Latin America and the Caribbean*
- 15:25 An update on the GNSS activities, Jina MACEACHERN, *Canada*
- 15:40 – 16:00 *Coffee Break*

16:00 – 18:00 Panel of Experts – GNSS: Today and Preparing for the Future

Chair: Ruth NEILAN, International Association of Geodesy

Attended by all. The primary purpose is for GNSS Experts to offer their views on GNSS today and vision for the future. The audience will have an opportunity to ask the panel members questions.

Invited Panelists:

Brad PARKINSON, *Co-Chair of the U.S. PNT Advisory Board*

Gerhard BEUTLER, *Founding Chair of IGS*

Bill KUO, *Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC), UCAR*

Glenn GIBBONS, *Inside GNSS*

Grant HAUSLER, *GNSS and National Positioning Infrastructure in Australia*

Mikael LILJE, *International Federation of Surveyors and United Nations Global Geodetic Reference Frame, Global Geospatial Information Management*

Greg TURETSKY, *Intel and Industry Perspectives on Receiver Designs*

Stephanie WAN, *Co-Chair of Space Generation Advisory Council (SGAC) and Co-Founder of the Youth for GNSS (YGNSS) Project*

18:00 **Adjourn**

18:30 **Reception** at the *National Center for Atmospheric Research (NCAR) Mesa Laboratory*

Tuesday, 03 November 2015

08:00 – 14:00 **On-site Registration**

08:30 – 10:30 **Applications and Experts Session – Observing Earth Processes Using GNSS**

*Co-chairs: Penny AXELRAD, University of Colorado Boulder and
Linda ROWAN, University-governed Consortium (UNAVCO)*

***Attended by all.** The primary purpose is for participants or invited presenters to raise awareness of issues and/or opportunities in user applications and GNSS technology for consideration by the ICG and/or its working groups.*

Invited Speakers:

Development of BeiDou Navigation Satellite System (BDS): An Application Perspective, Jun SHEN, *International Cooperation Centre, China Satellite Navigation Centre, China*

GNSS Ionospheric Sounding for Space Weather, Thomas BERGER, *National Oceanic and Atmospheric Administration Space Weather Prediction Center, United States*

Review of GNSS as sources of opportunity for Earth Observation: Radio-Occultation and Reflectometry, Estel CARDELLACH GALI, *Institut De Ciencies de L Espai, Spain*

Using GNSS signals to measure soil moisture, vegetation water content, snow depth, water levels, permafrost, and volcanic plumes, Kristine LARSON, *University of Colorado Boulder, United States*

GNSS for monitoring regional water resources and cryospheric changes, Tonie VAN DAM, *University of Luxembourg, Luxembourg*

Update on the International Terrestrial Reference Frame and Handling Deformation Caused by Large Earthquakes, Zuheir ALTAMIMI, *Laboratoire de Recherche en Géodésie, France (to be presented by Tonie VAN DAM)*

GNSS Augmentation to the Tsunami Early Warning System, John LABRECQUE, *Global Geodetic Observing System, Geohazards Monitoring Focus Area*

10:30 – 10:50 *Coffee Break*

**Working Groups Meetings
(Parallel Sessions)**

10:50 – 12:30 **WG A – Compatibility and Interoperability**

Co-chairs: David TURNER, United States of America and Sergey REVNIVYKH, Russian Federation

(in parallel) WG C – Information dissemination and capacity building

Chair: Sharafat GADIMOVA, Office for Outer Space Affairs and Barbara ADDE, United States

12:30 – 13:30 *Lunch break*

13:30 – 15:00 WG A – Compatibility and Interoperability (continues)

(in parallel) WG C – Information dissemination and capacity building (continues)

15:00-15:20 *Coffee Break*

15:20 – 18:00 Technical Tours (*The University-governed Consortium (UNAVCO), the National Oceanic and Atmospheric Administration (NOAA) Space Weather Prediction Center, and the National Institute of Standards and Technology (NIST) Precision Measurement Laboratory*)

18:00 Reception at Avery Brewing Company

Wednesday, 04 November 2015

08:00 – 14:00 On-site Registration

**Working Groups Meetings (continues)
(Parallel Sessions)**

09:00 – 11:00 Joint Working Groups Meeting

11:00 – 11:20 *Coffee Break*

11:20 – 12:30 WG B – Enhancement of performance of GNSS services

Co-chairs: K S PARIKH, India and Stefan WALLNER, European Space Agency (ESA)

(in parallel) WG D – Reference Frames, Timing and Applications

Co-chairs: Ruth NEILAN, International GNSS Service (IGS), Chris RIZOS International Association of Geodesy (IAG) and Neil WESTON, Federation of Surveyors (FIG)

12:30 – 13:30 *Lunch*

13:30 – 18:00 WG B – Enhancement of performance of GNSS services (continues)

(in parallel) WG D – Reference Frames, Timing and Applications (continues)

15:40 – 16:00 *Coffee Break*

18:00 **Adjourn**

Thursday, 05 November 2015

09:00 – 11:00 (in parallel) Working Groups Meetings

Working groups to prepare conclusions and recommendations for the ICG consideration.

11:00 – 11:20 *Coffee Break*

11:20 – 15:50 Second Plenary Session of the ICG (Presentations by Working Groups)

Chair: Kenneth HODGKINS, United States of America

Attended by all. The primary purpose is for the Working Groups to present results of their meetings or any inter-sessional meetings held since the Ninth Meeting of the ICG. Presentations will include any draft recommendations to the ICG.

11:20 – 12:05 Presentation by WG A and Discussions

12:05 – 12:50 Presentation by WG B and Discussions

12:50 – 14:20 *Lunch break*

14:20 – 15:05 Presentation by WG C and Discussions

15:05 – 15:50 Presentation by WG D and Discussions

15:50 – 16:10 *Coffee Break*

16:10 – 18:00 Second Session of the Providers' Forum

Co-chairs: Kenneth HODGKINS, United States of America and Pieter DE SMET, European Union

Attended by only the Providers. The primary purpose is to discuss any draft recommendations to the ICG from the working groups and to develop response or suggest amendments to the draft recommendations.

(in parallel) Meeting of Associate Members, Observers and invited observers (as needed)

The purpose is to discuss issues of common concern that have emerged during earlier sessions.

18:00 **Adjourn**

18:30 **Banquet at the Stadium Club at the University of Colorado at Boulder**

Friday, 06 November 2015

09:00 – 13:00 **Third Plenary Session of the ICG**

Chair: Kenneth HODGKINS, United States of America

Attended by all. The primary purpose is to consider final recommendations as considered by the Providers' Forum. This session will also consider other ICG-related issues.

Consideration of proposed ICG recommendations (as needed)

Review and approval of meeting conclusions (joint statement, press release, etc.)

Other matters:

- **Russian Federation:** Announcement for the Eleventh Meeting of the ICG in 2016

- **Expression of Interest:** to host the ICG meetings in 2017 (Japan), 2018 (China) and 2019 (India)

Closing Statements

13:00 **Adjourn**