



***IGS Workshop 2012-ICG Working Group A***

# **BeiDou: Bring the World and China to Your Doorstep**

**China Satellite Navigation Office**

**2012.7.25 Olsztyn, Poland**



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- I. Development Schemes**
- II. Performance**
- III. Application Achievements**
- IV. International Work**
- V. China Satellite Navigation  
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- VI. Activities Related to ICG**



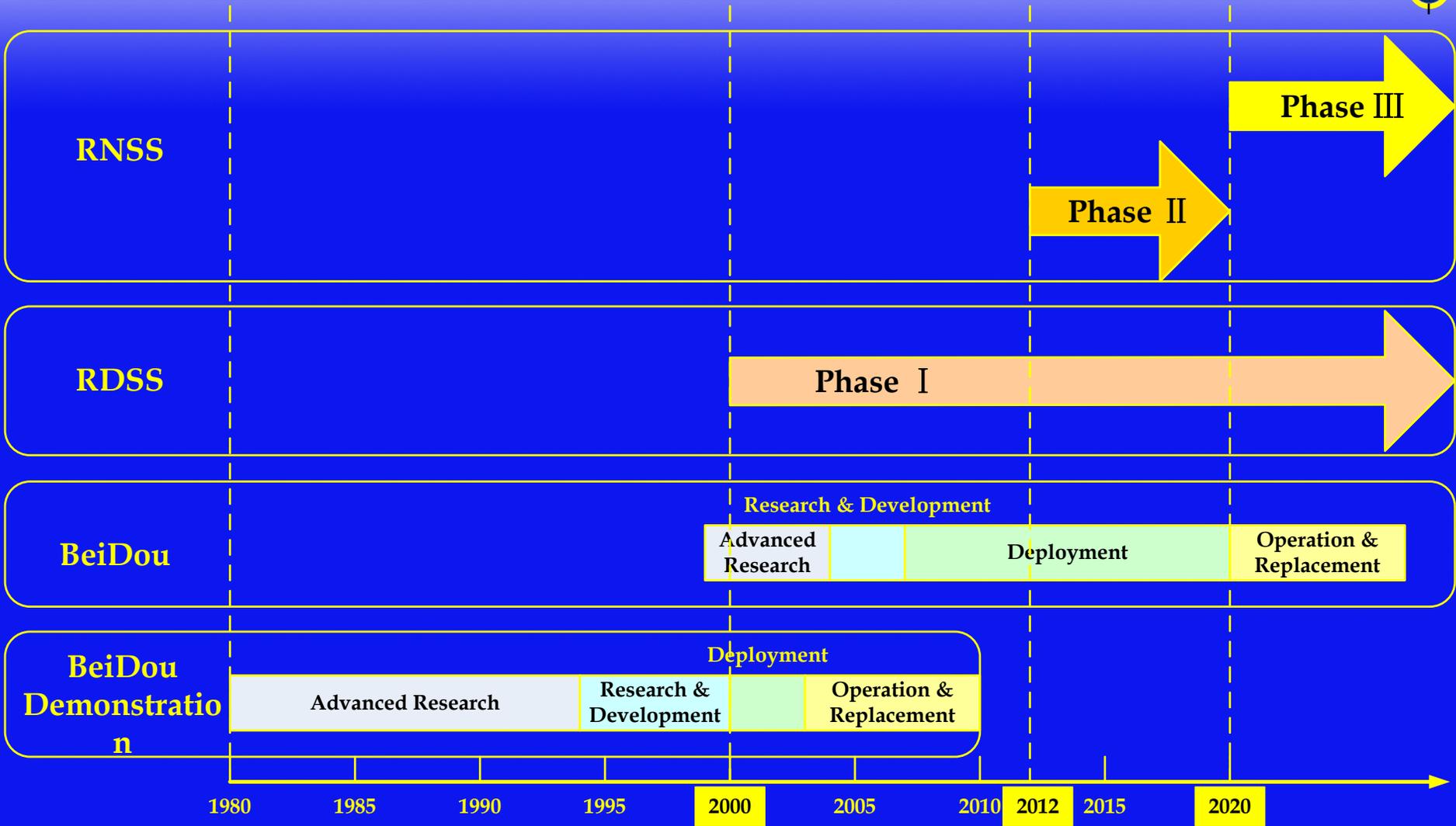
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# Development Plan



\*BeiDou-Demonstration —— BeiDou Navigation Demonstration System

RDSS —— Radio Determination Satellite System

BeiDou —— BeiDou Navigation Satellite System

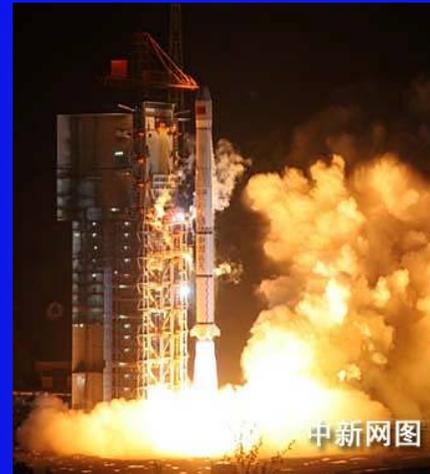
RNSS —— Radio Navigation Satellite System



# *BeiDou Demonstration System*



## ■ The first stage: BeiDou demonstration system





# *BeiDou Navigation Satellite System*



## ■ The second stage: Regional navigation system

- **14 satellites: 5 GEO, 5 IGSO, 4 MEO**
- **So far this year, three BeiDou satellites have been launched. The operational satellites in orbit are 11 now.**
- **Another three satellites will be launched**





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# Satellites Launches



## ■ Space constellation

Stage	BeiDou Demonstration System				BeiDou Navigation Satellites System												
	01	02	03	04	01	02	03	04	05	06	07	08	09	10	11	12	13
Num	01	02	03	04	01	02	03	04	05	06	07	08	09	10	11	12	13
Type	GEO	GEO	GEO	GEO	MEO	GEO	GEO	GEO	IGSO	GEO	IGSO	IGSO	IGSO	IGSO	GEO	MEO	MEO
Date	2000.10.13	2000.12.21	2003.05.25	2007.02.03	2007.04.14	2009.04.15	2010.01.17	2010.06.02	2010.08.01	2010.11.01	2010.12.18	2011.04.10	2011.07.27	2011.12.02	2012.02.25	2012.04.30	2012.04.30
Status	Deorbit	Deorbit	Operational	In maintenance	Flight test	In maintenance	Operational										

 Deorbit

 Operational

 Flight test

 In maintenance



# *Initial performances*



## ■ Performance of Initial Operational Service

### ➤ Service Coverage Area

From 84°E to 160°E; from -55° to 55°N

### ➤ Positioning Accuracy

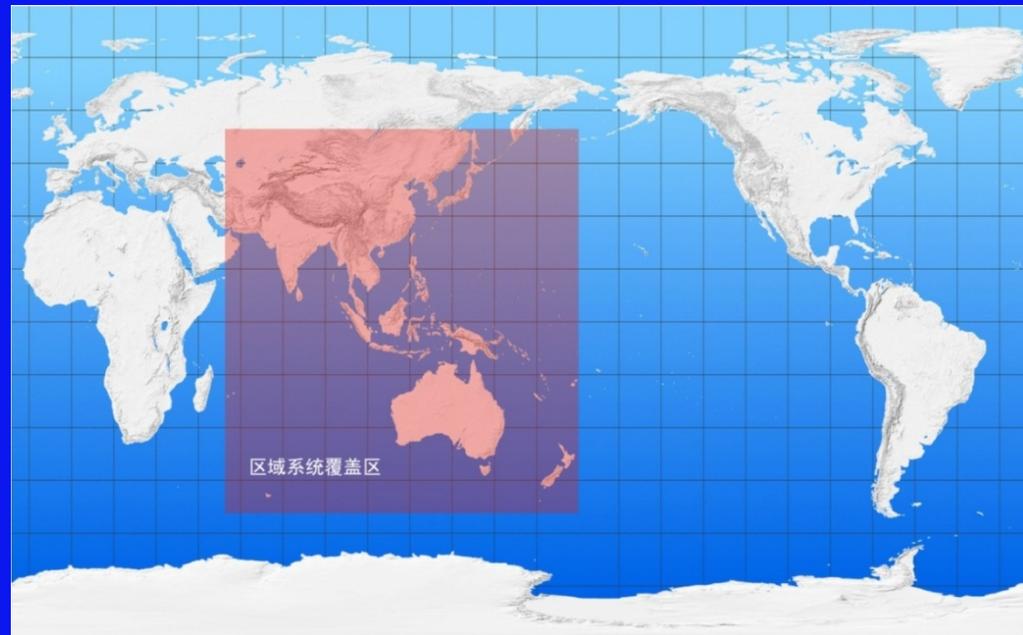
Horizontally 25m, Vertically 30 m

### ➤ Velocity Accuracy

0.4m/s

### ➤ Timing Accuracy

50 ns

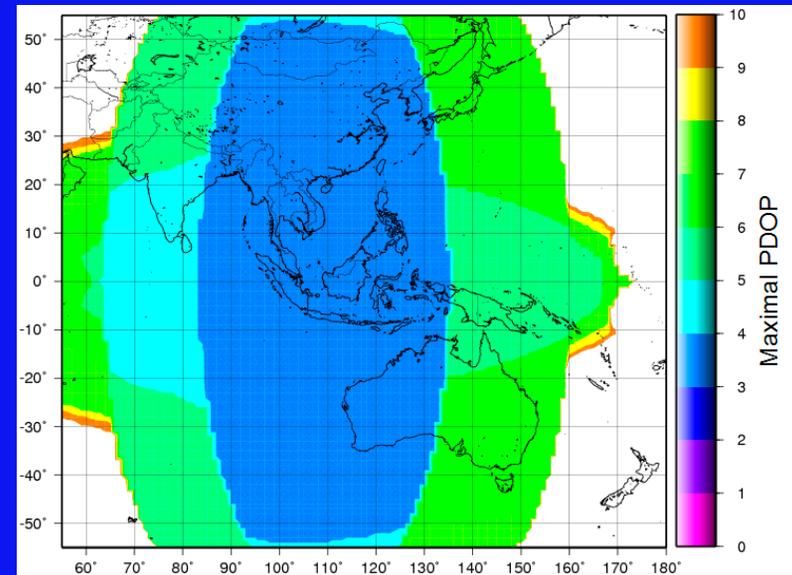
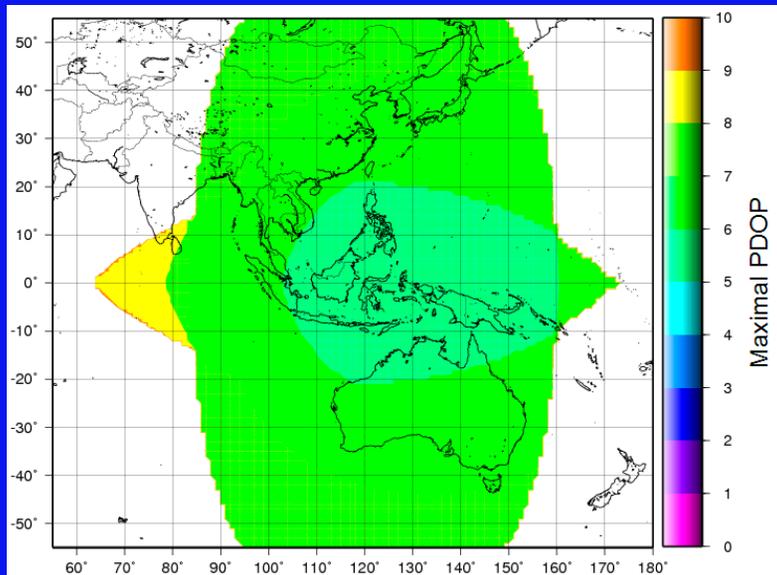




# Initial performances



- The system performance is stable. The user experience for the PNT service performance has been enhanced significantly.



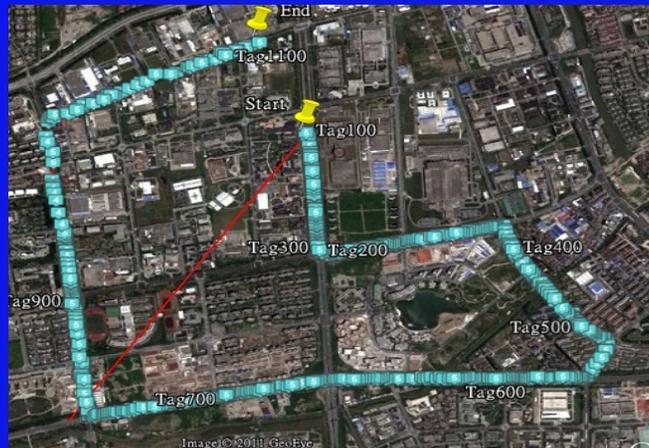


# Initial performances



## ■ System test

- User trial tests were conducted in the preliminary stage of Initial Operational Capability (IOC).





## *Some policies*

- **Initial Service of BeiDou System has been announced**
  - On Dec. 27 2011, the State Council Information Office, P.R.C. held a press conference to announce the initial service of BeiDou System.

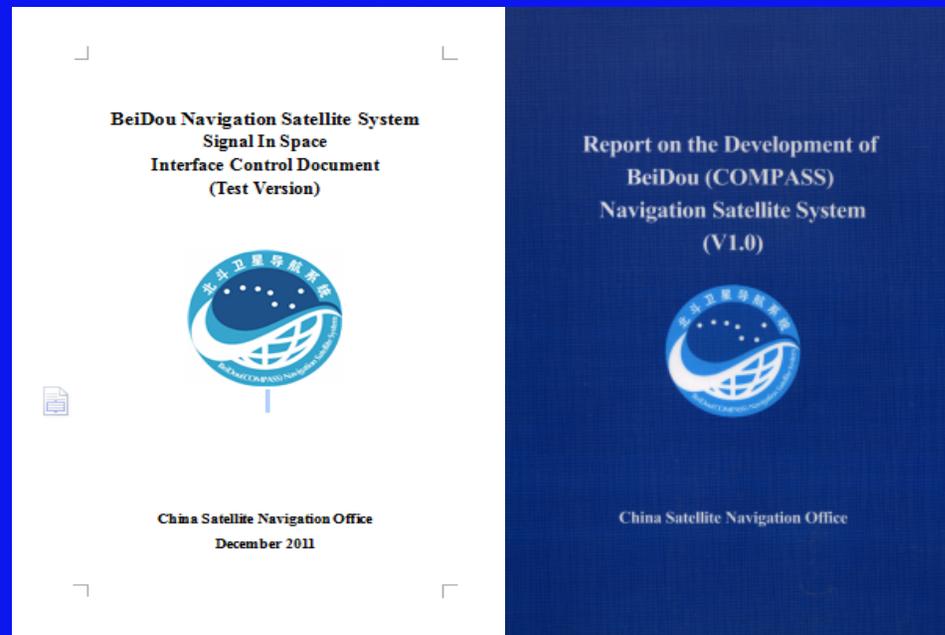




# *Some policies*

## ■ Published two files

- Development of BeiDou Navigation Satellite System (V1.0)
- Interface Control Document (ICD) of BeiDou Navigation Satellite system (test version)





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# Chips and terminals R&D

## ■ BeiDou/GPS dual-mode chip



## ■ Components of BeiDou/GPS dual-mode vehicle terminal

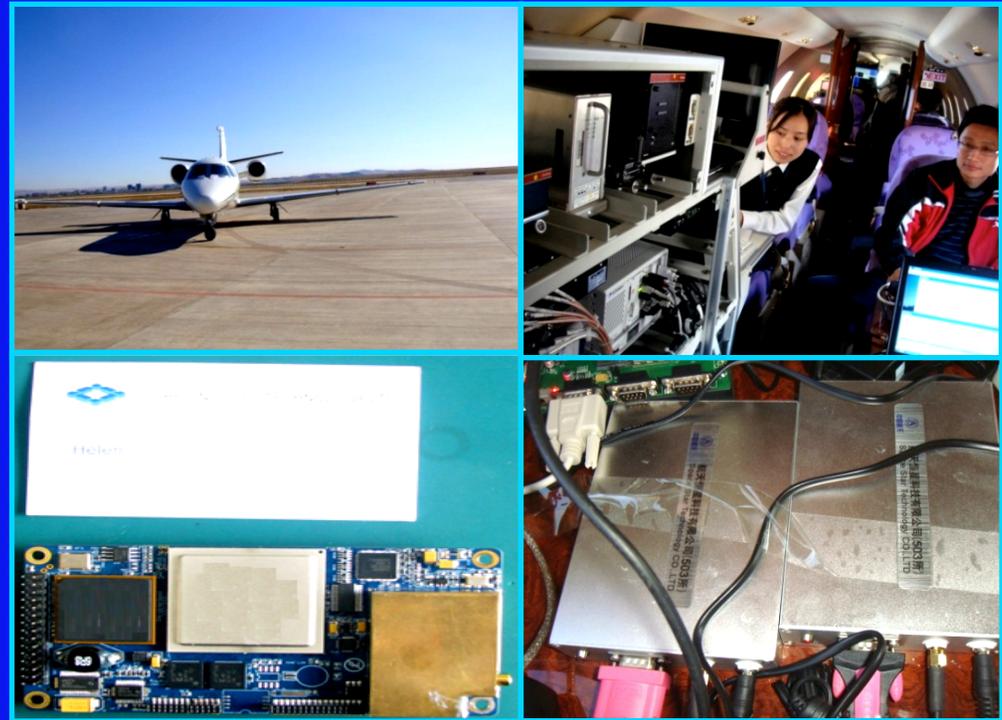




# Civil Aviation



- **Airborne test**
- **Focus on reliability and safety**
- **Promote civil aviation application standards**





# Transportation



## ■ Transportation monitoring & management demonstration system



- Collecting traffic information
- Preventing fatigue driving
- Monitoring dangerous goods
- Ensuring safety
- Improving service efficiency



# Meteorology



- **Atmosphere, ocean, space monitoring & early warning demonstration system**
  - **High altitude detecting balloon**
  - **Ionosphere and water vapor monitoring**
  - **Sea wind and waves**
  - **Meteorological disaster early warning and information dissemination**





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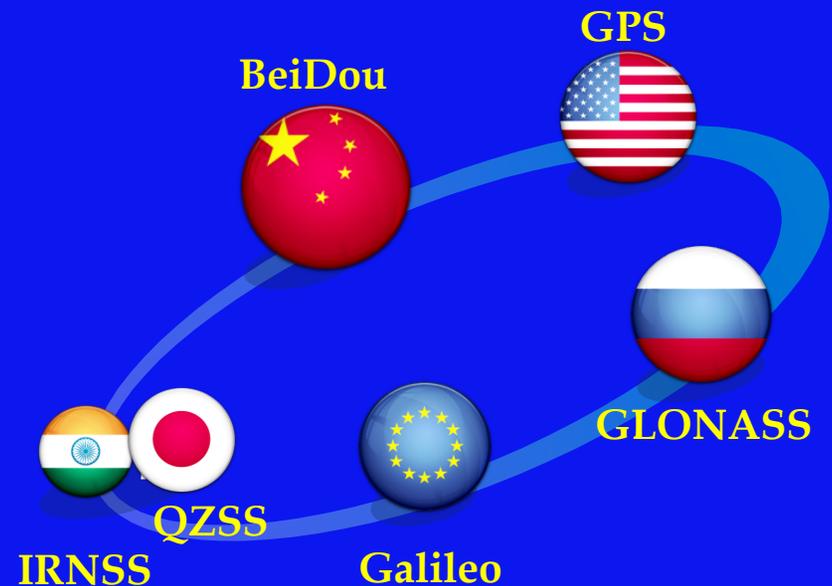
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# International Work

## ■ Openness and cooperation, mutual benefits and win-win results

- To carry out GNSS compatibility and interoperability and frequency coordination
- To participate in all activities of ICG
- To promote BeiDou to merge into international standards
- To promote BeiDou to merge into GNSS





# International Work

## ■ Some multilateral and bilateral coordination





# International Work





# International Work





# *International Work*



- **Promoting international initiatives**
  - **Proposing the initiative of iGMAS**
  - **Participating in Multi-GNSS experiment of IGS and the Multi-GNSS demonstration plan in Asia and Oceania**
  - **Initiating BeiDou/GNSS Application Demonstration and Experience Campaign (BADEC)**
  - **Supporting new frequency resource extension of satellite navigation**



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# China Satellite Navigation Conference

## ■ China Satellite Navigation Conference

- enhancing academic innovation to promote cooperation and exchanges in the field of satellite navigation.
- strengthening technological innovation to accelerate engineering construction of satellite navigation systems.
- intensifying theoretical innovation to facilitate theory progress of satellite navigation.
- reinforcing application innovation to boost scientific development of the satellite navigation industry.





# China Satellite Navigation Conference

- The 1st CSNC was held in Beijing from May 19 to 21, 2010, including special workshop, international technical exchange, science etc. The technical exhibition of the 1st CSNC was also hosted
- Participants of CSNC-2010 account for over **1100**.





# China Satellite Navigation Conference

- The second CSNC was held in Shanghai from May 18 to 20, 2011.
- Participants of the CSNC-2011 account for over **1660**, and 582 technical papers were published in the conference proceeding.





# China Satellite Navigation Conference

- 3rd CSNC was held in Guangzhou from May 16 to 19, 2012. Registered representatives are about **2000**
- Theme of the 3rd CSNC is “BeiDou going to application”, aiming at perfecting system capacity, evaluating system, renewing application model, discussing application technology and developing industrial links.





# China Satellite Navigation Conference

- The first CSNC-ION Joint Panel was held in Guangzhou on May 15th, 2012.
- GNSS Providers were invited to present the update of the system and service provision
- Invited Presentations
- English Session was included in every report session

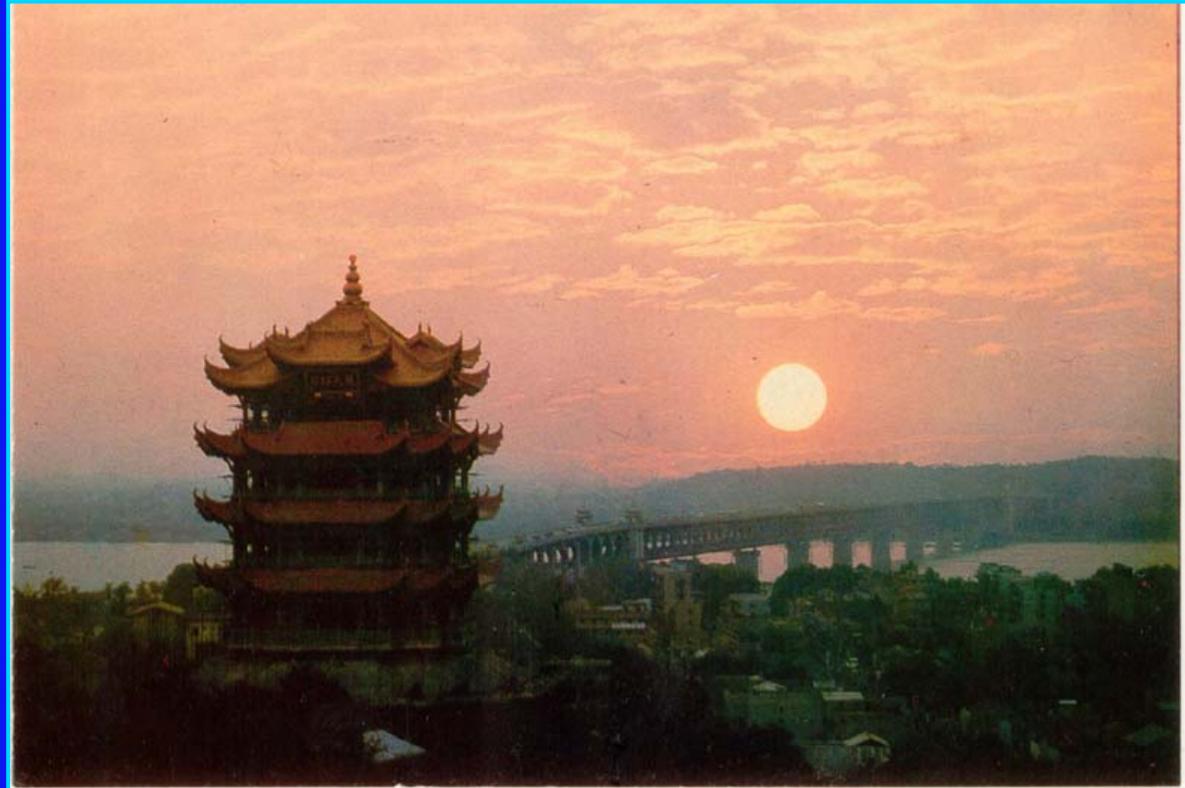




# China Satellite Navigation Conference

## ■ The 4th CSNC

- Wuhan, Hubei Province, China
- May 15-17, 2013





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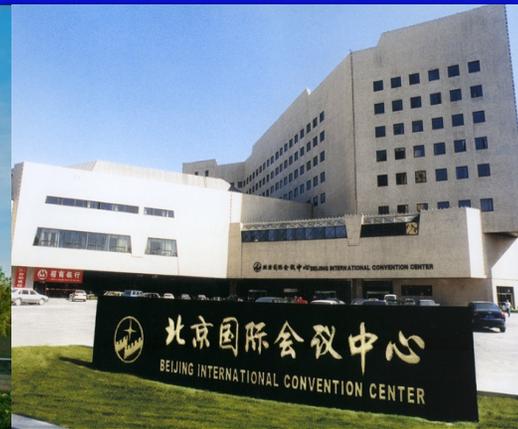
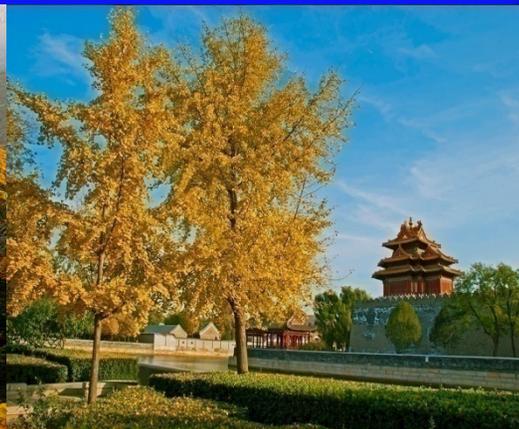
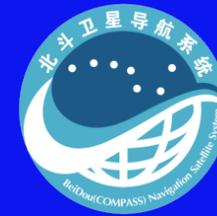
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# Activities Related to ICG



- **The 7th Meeting of ICG will be held in Beijing from Nov 4 to 9, 2012.**





# Agenda



	4 Nov. Sun	5 Nov. Mon	6 Nov. Tue	7 Nov. Wed	8 Nov. Thu	9 Nov. Fri	
<b>MORNING</b>		Registration	Application and/or Expert Forum				
		Opening Ceremony & 1st Plenary Session	2nd session of Providers' Forum	Meeting of WG A	Meeting of WG C	2nd Plenary Session	3rd Plenary Session
<b>AFTERNOON</b>	Registration	Application and/or Expert Forum	Technical Tour	Meeting of WG B	Meeting of WG D	3rd session of Providers' Forum	Meeting of Members, Associate Members and Observers
	Meeting with the WGs Co-Chairs & 1st session of Providers' Forum						
<b>EVENING</b>		Welcome Dinner		Welcome Reception			



# Technical Tour



■ **Time: Nov. 6th, PM, lasts for 4 hrs. Tourism routes are as follows:**

➤ **China Academy of Space Technology (CAST):** Visit the exhibition center and learn about comprehensive capabilities of satellites manufacturing in China.

➤ **China Academy of Aerospace Electronics Technology:** Learn about the operation status of BeiDou system, overall structure of iGMAS, and performance of its monitoring stations and equipment.

➤ **Summer Palace:** Visit the royal landscape and digest different culture.

## Group 1:



China Academy of Aerospace Electronics Technology



China Academy Of Space Technology



Summer Palace

## Group 2:



China Academy Of Space Technology



China Academy of Aerospace Electronics Technology

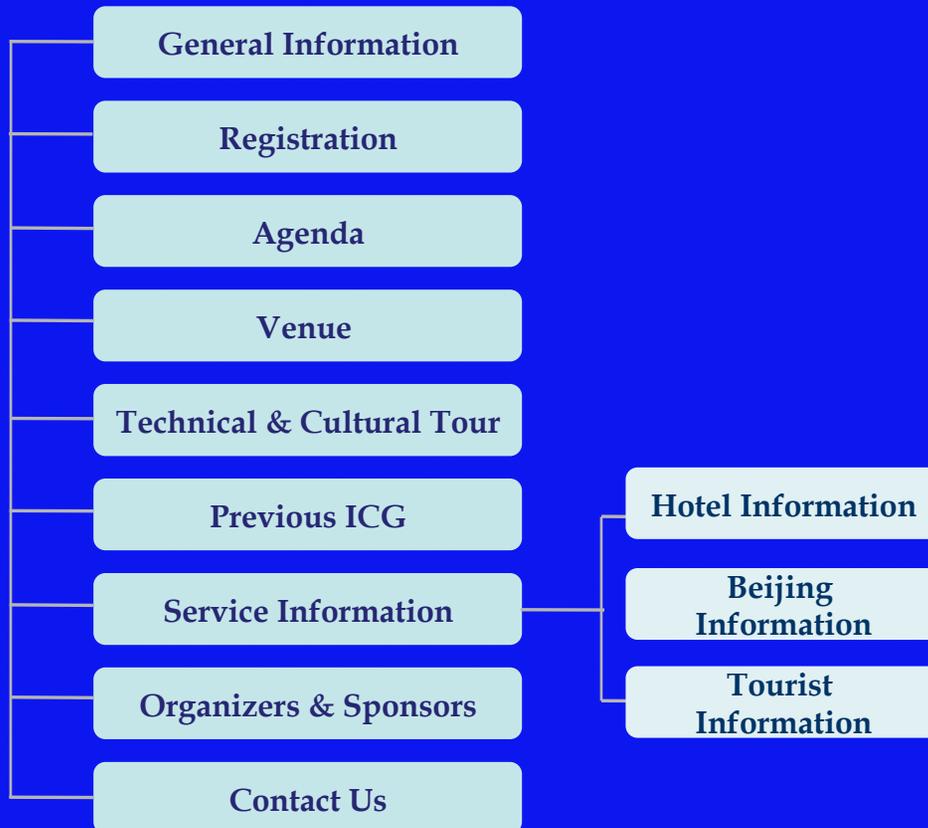


Summer Palace



# Website

- The website of ICG-7 ([www.icg2012.cn](http://www.icg2012.cn)) has been officially launched on May 15th, including following sessions:



General Information

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**General Information**

**Seventh Meeting of the International Committee on Global Navigation Satellite Systems (ICG) hosted by the Government of People's Republic of China Beijing, 5th November (Mon.) - 9th November (Fri.), 2012**

On behalf of the Government of People's Republic of China for the Seventh Meeting of the International Committee on GNSS (ICG-7), we have the pleasure to invite you and warmly welcome you to Beijing, China this coming November. The ICG-7 will be held in Beijing, China, from 5th to 9th November, 2012.

The International Committee on Global Navigation Satellite Systems is established on a voluntary basis as an informal body to promote cooperation, as appropriate, on matters of mutual interest related to civilian satellite-based positioning, navigation, timing and value-added services, as well as the compatibility and interoperability of global navigation satellite systems, while increasing their use to support sustainable development, particularly in developing countries.

Participants are system providers, international governmental organizations and international non-governmental organizations. This ICG-7 meeting will include an agenda to permit time for the plenary session discussions, Providers' Forum discussions and Working Groups meetings. The meeting will take place at the Beijing International Convention Center (BICC) in Beijing, which is located on the North Fourth Ring road, 20 kilometers from the Beijing International Capital Airport (BICA). It has served almost 1,000 different international and domestic conventions, exhibitions and meetings each year since its establishment.

**We look forward to seeing you in Beijing!**

RAN Chengqi  
CHAIR, ICG-7  
Director General  
China Satellite Navigation Office (CSNO)

FOR ANY FURTHER INFORMATION ON ICG PLEASE REFER TO THE ICG PORTAL AT: <http://www.icgsecretariat.org>

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- **Welcome to Beijing for ICG-7, Nov 4-9, 2012**
- **Welcome to Wuhan for CSNC 2013, May 15-17, 2013**



# Thank You for Your Attention!

**ICG-7 ([www.icg2012.cn](http://www.icg2012.cn))**