



中国科学院遥感与数字地球研究所
Institute of Remote Sensing and Digital Earth ,CAS

Introduction to RADI,CAS

LIU Jie

Director of International Cooperation Office

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About RADI

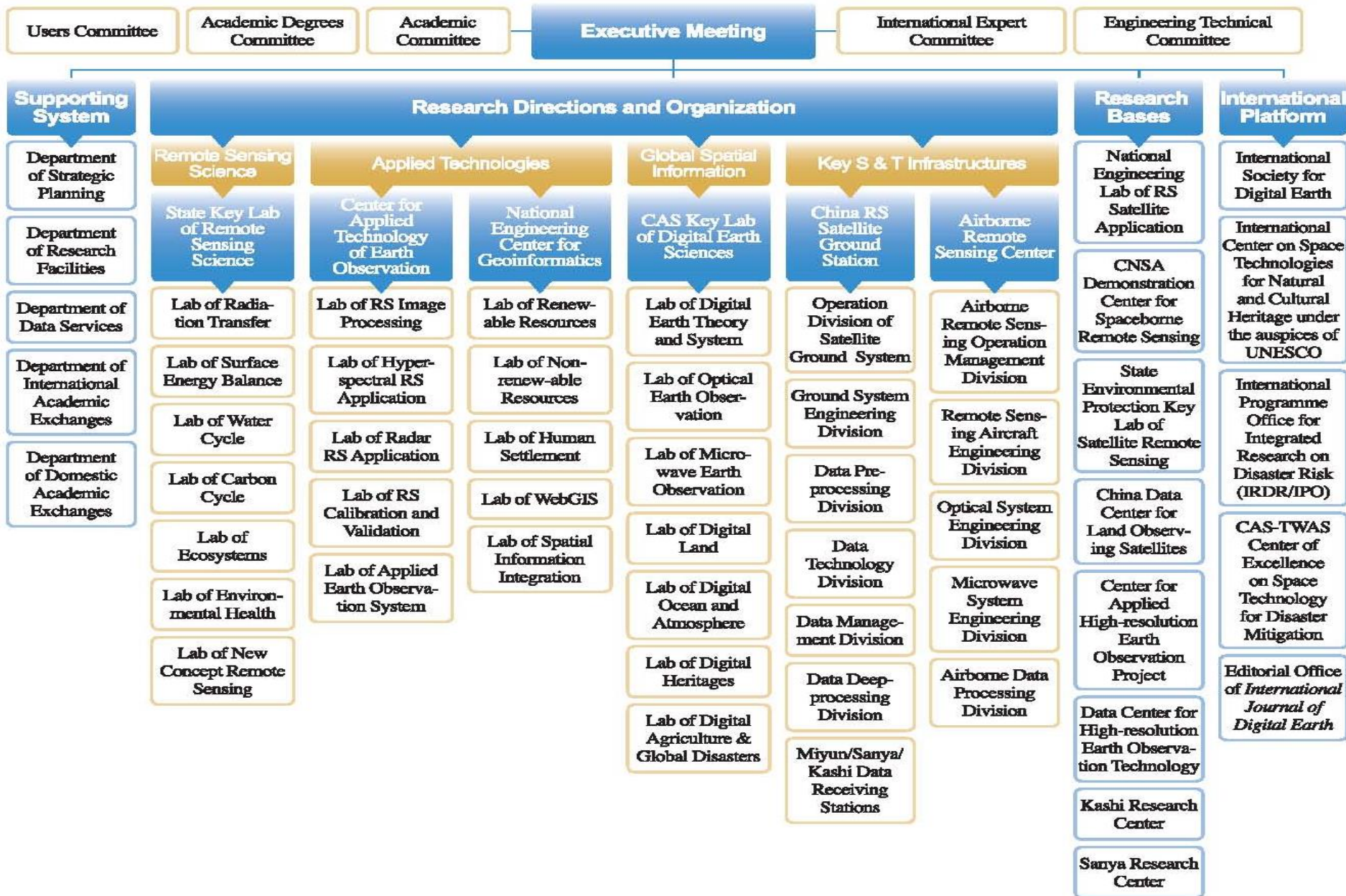


The **RADI** is an independent research institute affiliated to the Chinese Academy of Sciences for remote sensing and digital Earth.

Mission

- Reception, processing, archiving and dissemination of remotely sensed data.
- Research and development on supporting new earth observation system, improving remote sensing data processing and analytical methodologies, and promoting multidisciplinary applications based on earth observation technology.
- Theoretical and technological research into key issues concerning Geo-spatial Information science and Digital Earth Platform. They are involved together in solving some environmental problems at the global, regional and national scales.

Organization



Staff



6 research departments, **36** research units

1200 employees and students



303 senior scientists & technicians , **102** full professor

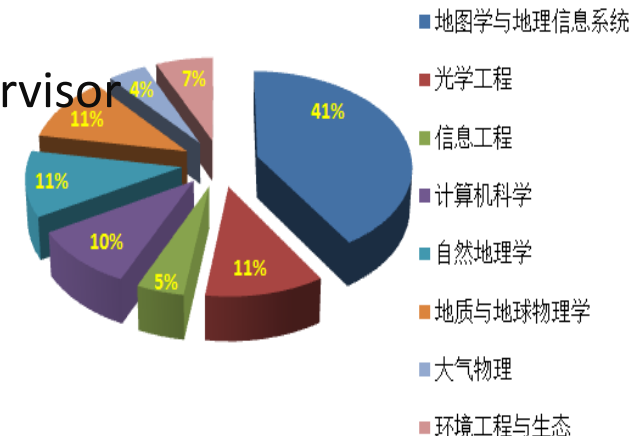
37 - average age and Ph.D. **43.98%**



3 CAS Member, **4** awardees of Thousand Talents Program

90 graduate supervisors, including **45** doctoral supervisor

4 International organizations



Campus





RADI's Four Core Competitive Competences

1. Spaceborne–airborne–ground remote sensing data acquiring and processing capacity.



Foreign satellites	Optical satellites	The US (USGS) : <i>LANDSAT-5, LANDSAT-7</i>
		France (SPOT Image) : <i>SPOT-1, SPOT-2, SPOT-4, SPOT-5</i>
		India (ISRO) : <i>RESOURCESAT-1 (IRS-P6)</i>
		Thailand (GISTDA) : THEOS
Radar satellites	European Space Agency(ESA): <i>ERS-1, ERS-2, ENVISAT</i>	
	Canada (MDA) :RADARSAT-1、RADARSAT-2	
China's satellites	Optical satellites	China-Brazil Earth Resource Satellites: <i>CBERS-01, CBERS-02, CBERS-02B</i>
		Environment disaster reduction satellites: HJ-1A、HJ-1B
		Resource satellites: ZY-02C、ZY-3
		SJ-9 satellites: SJ-9A、SJ-9B
		High-resolution satellite: GF-1
Radar satellites	Environment disaster reduction satellites: HJ-1C	

中國遙感衛星地面站

China Remote Sensing Satellite Ground Station a member of the Landsat Ground Station Operations Working Group, boasts one of the world's highest capacities for receiving, processing, and distributing satellite data.

With **over 3.3 million** scenes of satellite data filed since 1986, it is regarded as the **largest** Earth observation satellite data archive in China.

SatSee Technology

Low-cost “virtual ground station” for disaster mitigation

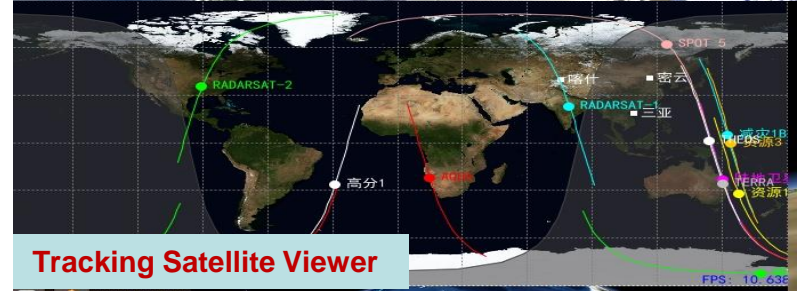
- 2Mbits **internet connection**
- **two computers** and a large **monitor or TV screen**
- Distributing **real time quick-look imagery** of high resolution satellite



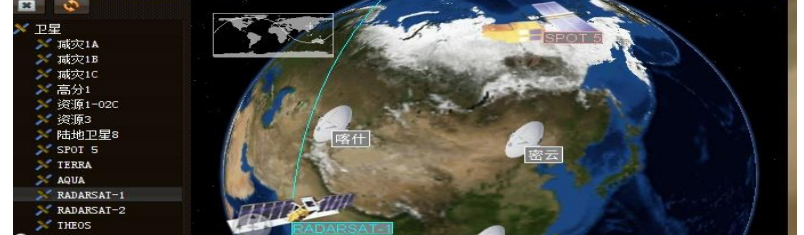
RADI's three stations receive data from satellites **covering 70% of Asia.**

SatSee System

real time quick-look imagery



Tracking Satellite Viewer



Installed in **Kirghizstan**
Mongolia, Cambodia, etc

1. Spaceborne-airborne-ground remote sensing data acquiring and processing capacity



◆ Two Remote Sensing Aircrafts

- Round-the-clock flying capability;
- Equipped with various airborne remote sensors, and can be used to test newly-developed advanced sensors;
- Provides high-resolution satellite data.

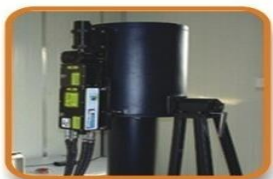
Cessna Citation S/II



Max Altitude	13,000 m
Max Range	3,300 km
Max Speed	746 km/h

◆ Two new Remote Sensing Aircrafts

- Equipped with 10 state-of-the-art remote sensors: visible, infrared, and microwave remote sensors and a high-performance data processing system.



Airborne atmospheric laser radar



Digital CCD camera



Airborne whiskbroom imaging spectrometer (0.45 μ m-12.5 μ m)



Airborne 3-D light detection and ranging



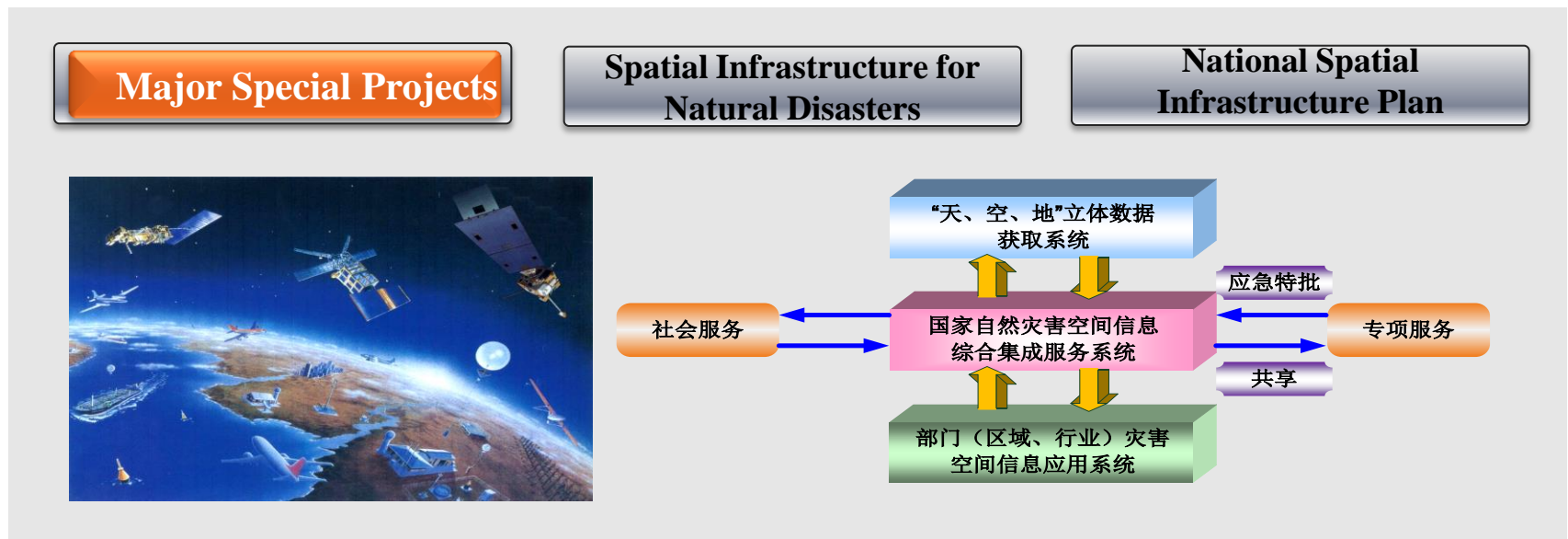
Airborne X-band interferometry SAR



Airborne pushbroom imaging spectrometer (0.45 μ m-2.5 μ m)

2. Remote sensing science and spatial information research capacity

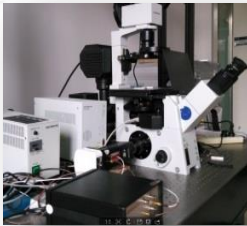
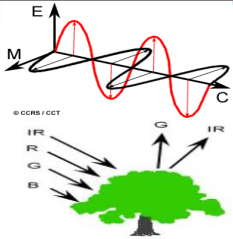
- Building All-band remote sensing mechanism simulation system, providing remote sensing theory and key technologies for Earth system key factors;
- Erecting an advanced space remote sensing payload verification system, testing the new sensors for a variety of satellites, including satellite for water cycle observation, satellite-borne Lidar, China-Brazil Earth Resources Satellite and hyperspectral satellites.
- Building up a Earth observation system simulation platform, providing planning support national major special projects.



Four core competitive competences

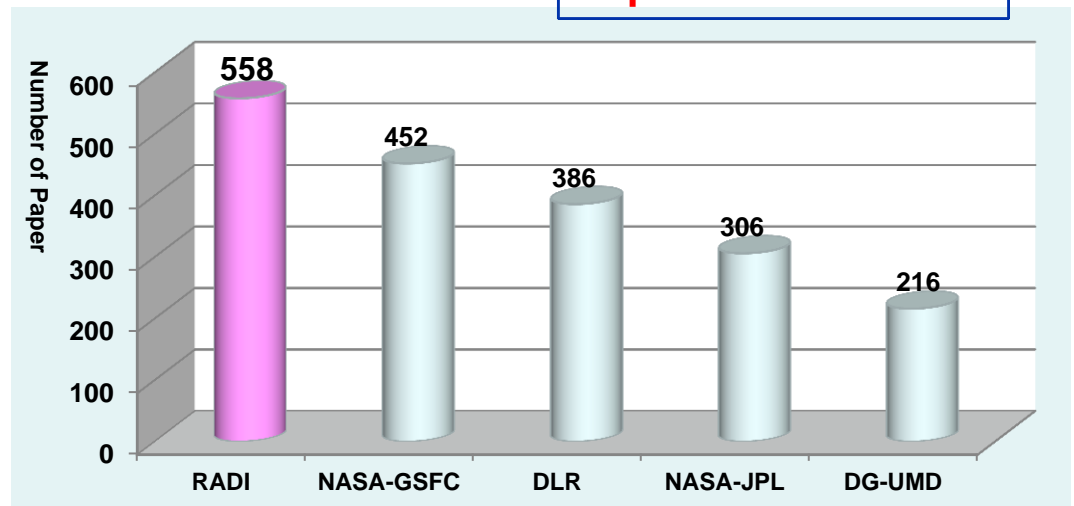
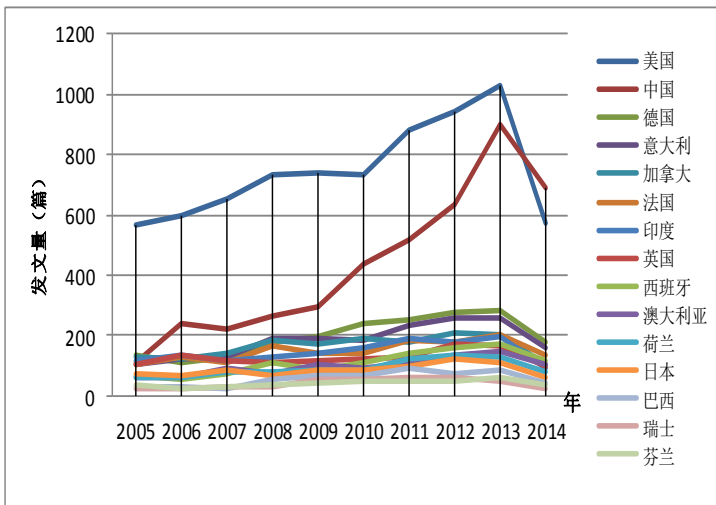
2. Remote sensing science and spatial information research capacity

Spaceborne-airborne-ground Earth observation system for high quality research



1st place: SCI-cited Papers in the Field of RS (2010-2014)

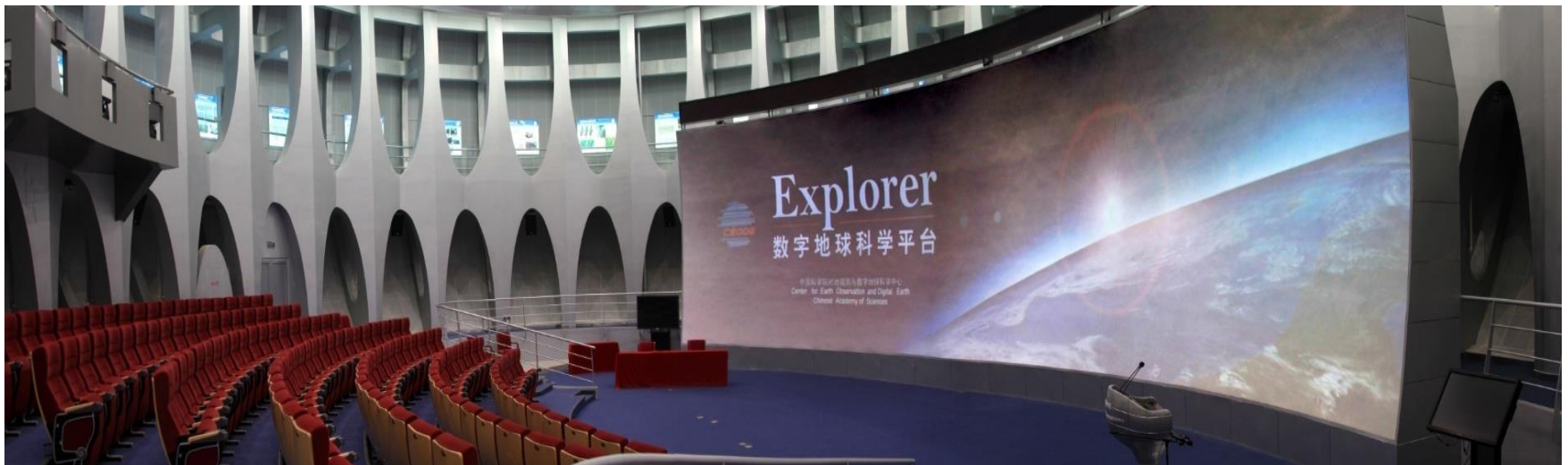
Top 5 in the world



3. Digital Earth science platform and global environmental resources information analytical ability

Professional digital earth theory and application research laboratory— **CAS Key Laboratory of Digital Earth Science**

- Developing the first Digital Earth Science Platform and establishing global resource-environmental spatial information system on the basis of the platform and the concept of “new generation Digital Earth” ;
- Developing more than 30 spatial information products of global resource-environment, being adopted by many national information release platforms.



Digital Earth Applications



Global Climate Change



Digital City



Food and Water Insecurity



Natural Disaster



Energy Resources



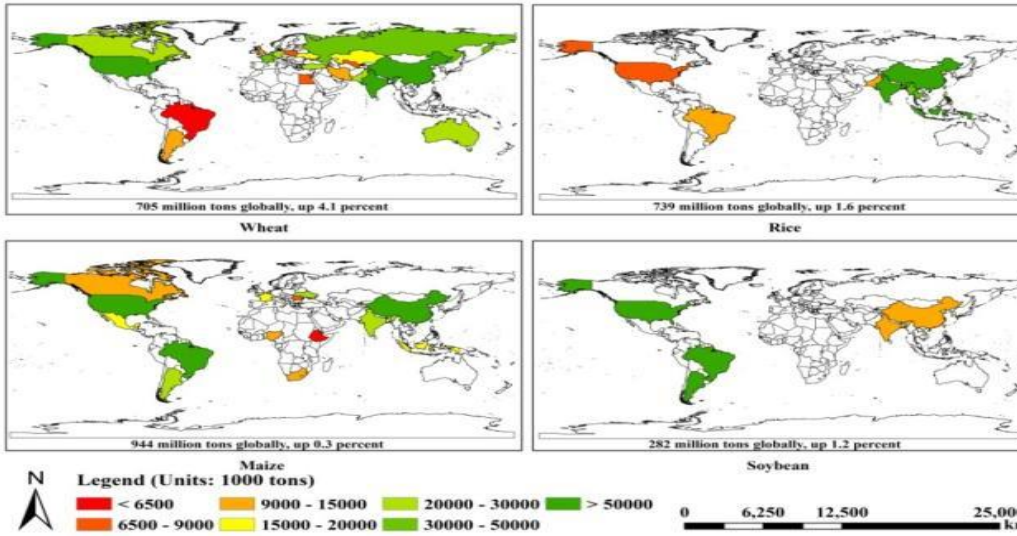
■ 30 categories of products, including land, ocean, atmosphere, urban construction;

■ Time-space scale: long-time series in global and regional scales.

CropWatch System

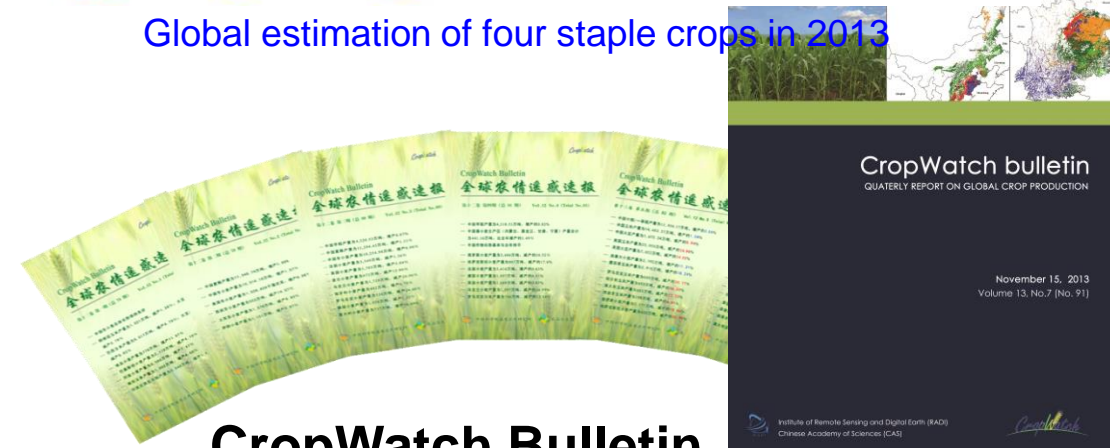


Conducting global agricultural monitoring by developing monitoring index system with multi-scale and multiple time-space resolution to support decision-making.



- multi-scale: global, inter-continental, major producing countries, province/state
- Full coverage: 31 major crop producing countries in the world
- It has been used by more than 30 users across the country, with worldwide attention

Global estimation of four staple crops in 2013



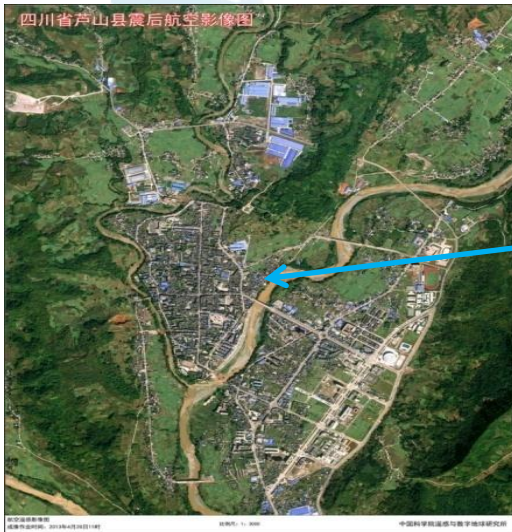
CropWatch Bulletin

<http://www.cropwatch.com.cn>

www.radi.cas.cn

Disasters monitoring and damage assessment

Soon after the Lushan earthquake, RADl was the **FIRST** to obtain remote sensing images of the disaster area and rapidly provided the authorities with relevant remote sensing data and disaster analysis.



Aerial remote sensing images produced by RADl were used at a State Council meeting chaired by Premier LI Keqiang on earthquake disaster mitigation on April 22, 2013.

In April 2013, Vice Premier Liu Yandong praised RADl for its rapid offering of high-resolution images for Lushan earthquake disaster reduction.



International Cooperation

International Cooperation



Global network/connections: partners in over 20 countries

International Organizations



Government, Institutions & Universities



Companies



● International organization hosted by RADI



- * International Center on Space Technology for Natural and Cultural Heritage *under the auspice of UNESCO* (HIST)
- * International Program Office of Integrated Research on Disaster Risk (IRDR IPO)
- * CAS-TWAS Center of Excellence on Space Technology for Disaster Mitigation (SDIM)
- * International Society for Digital Earth (ISDE)
- * International Journal of Digital Earth (IJDE)



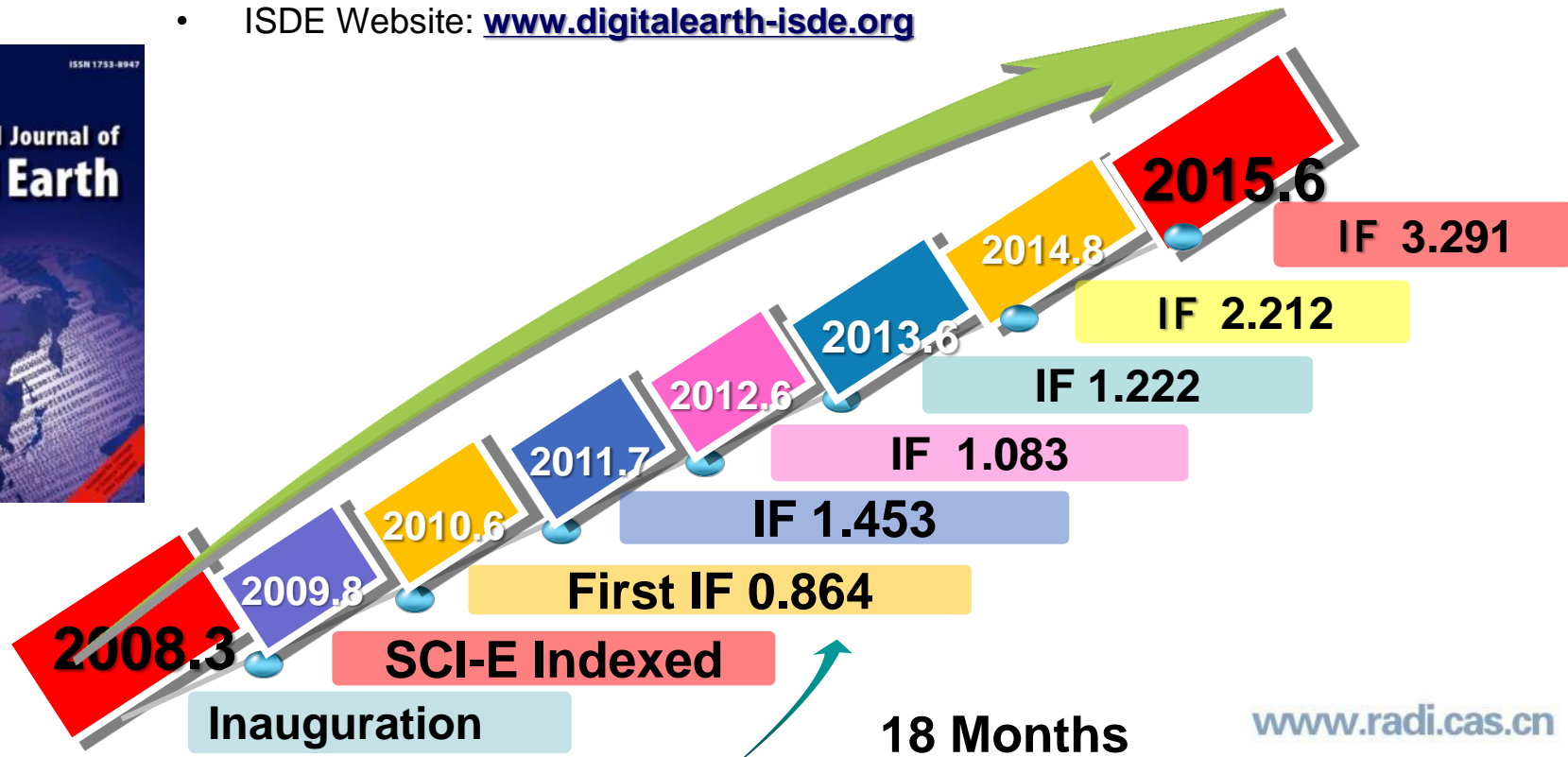
United Nations
Educational, Scientific and
Cultural Organization



Digital Earth Society and Journal



- The **International Society for Digital Earth (ISDE)** founded in May, 2006, China
- The mission of the society is to provide a framework for understanding evolving societies and newly emergent technologies and to revise the **Digital Earth Vision** in light of current developments.
- ISDE Website: www.digitalearth-isde.org



18 Months

International Programme Office for Integrated Research on Disaster Risk

Being hosted by RADl (approved in November, 2009). *First International Office of a large science program ever established in Asia.*

IRDR CHINA established in 2010, one of the national committees of IRDR

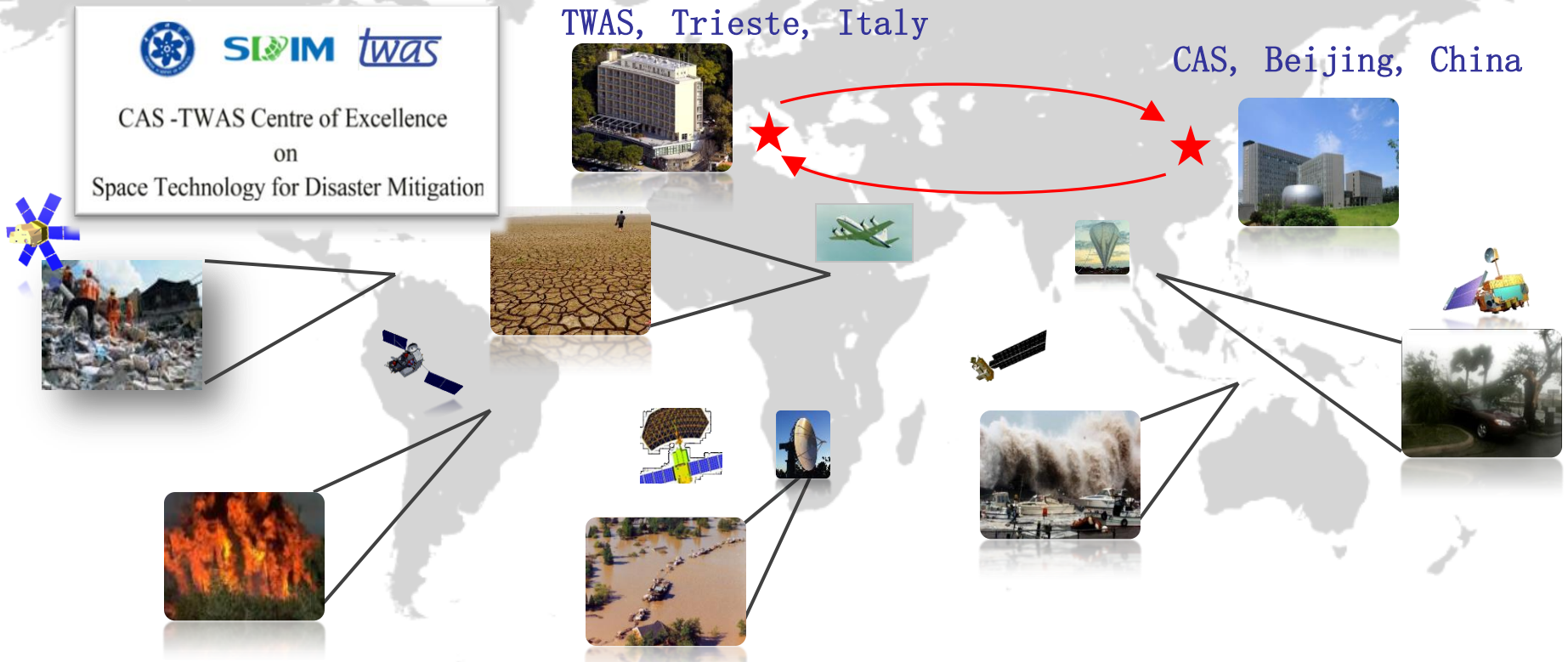


Addressing the challenge of natural and human-induced environmental hazards

An *integrated approach* to research on disaster risk through: an *international, multidisciplinary* (natural, health, engineering and social sciences, including socio-economic analysis) *collaborative* research programme.

CAS-TWAS Centre of Excellence on Space Technology for Disaster Mitigation (SDIM)

SDIM is committed to the studies of some key technologies of disaster reduction by using remote sensing, and focus on cooperation and capacity building for the developing countries.



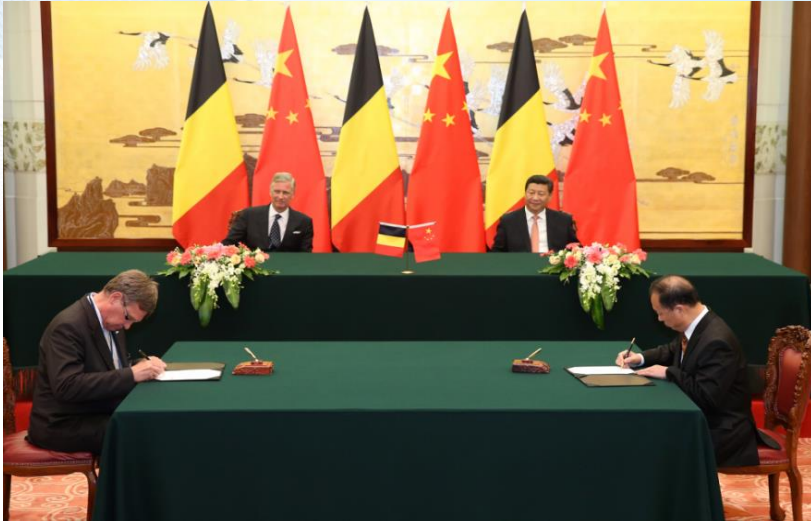
Joint Research Program

Education

Training Workshop

Conference and Seminar

International Collaborative Activities



RADI-VITO MoU signed on June 23, at the witness of Chinese President Xi Jinping and the King Philippe of Belgium at the Great Hall of the People, to collaborate closely and structurally to jointly **implement the concept report of the CropWatch science satellite constellation mission**, which aims to monitor the vegetation, agriculture and water at a global scale.



RADI-JRC collaborative research arrangement on June 29, at the witness of Chinese Premier Li Keqiang, Presidents of the European Council and the European Commission. **The agreement was listed in the 17th China-EU Summit joint statement as one of the major outcomes. Six major fields of cooperation:** human settlements analysis, digital earth science platform, land and soil degradation, air quality, land cover mapping, and agricultural monitoring.



RADI-NASA Join hands in Glacier Change and Associated Hazards using Earth Observations



Three Workshops:

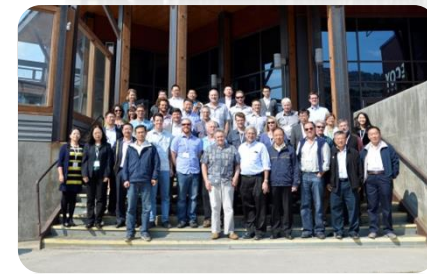
- CAS-NASA Workshops in Nepal, USA and China.

Two Main Themes: Glacier change and associated Hazards

- Pool the advantages of the two sides in EO and glacier and snow cover studies;
- Develop decision support tools for the sustainable development of the region;
- Promote the establishment of a mechanism underlying the long-term Sino-US cooperation on global change over HMA.



Group photo in Nepal



4. Summary of Key Information

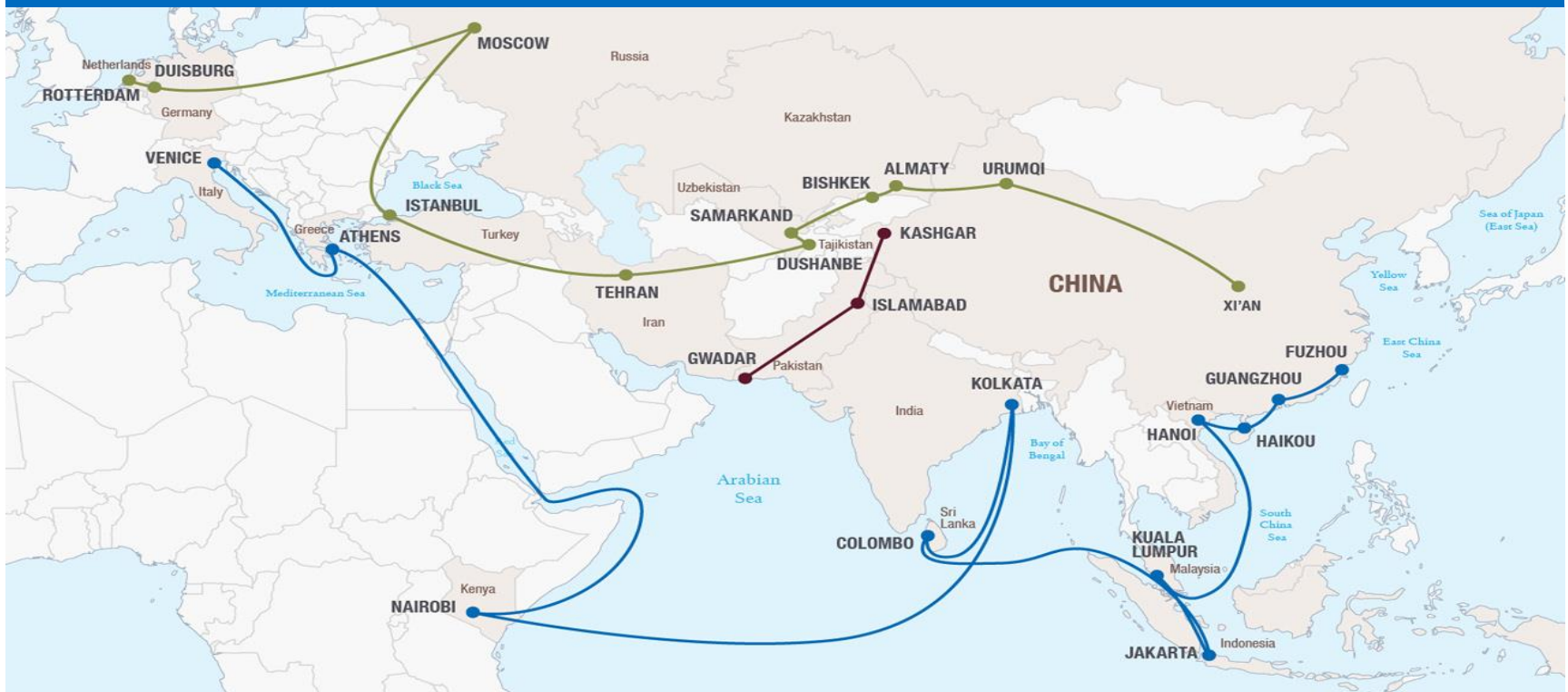
Expected program budget for first year of new awards	~ \$3.5M per year
Number of new awards pending adequate proposals of merit	~12
Maximum duration of awards	3 years



ASA Administrator Charles F. Boden and the USA delegation visit RADI

Belt and Road (BAR) Initiative

- In 2013, the initiative of jointly building the Silk Road Economic Belt and the 21st Century Maritime Silk Road (hereafter referred to as the Belt and Road) was initiated by Chinese President Xi, which have attracted close attention from all over the world.
- In 2015, China focused on making all around progress in the "Belt and Road" framework.



— SILK ROAD ECONOMIC BELT — MARITIME SILK ROAD — CHINA-PAKISTAN ECONOMIC CORRIDOR

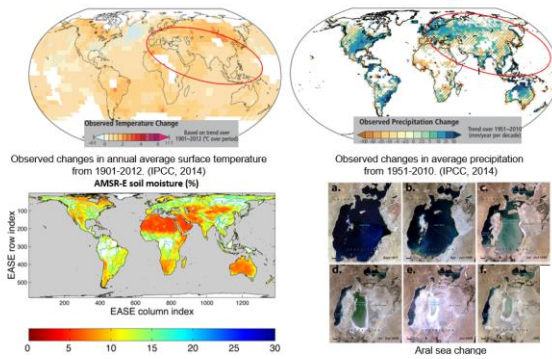
Source: Xinhua

Credits: James McBride, Julia Ro

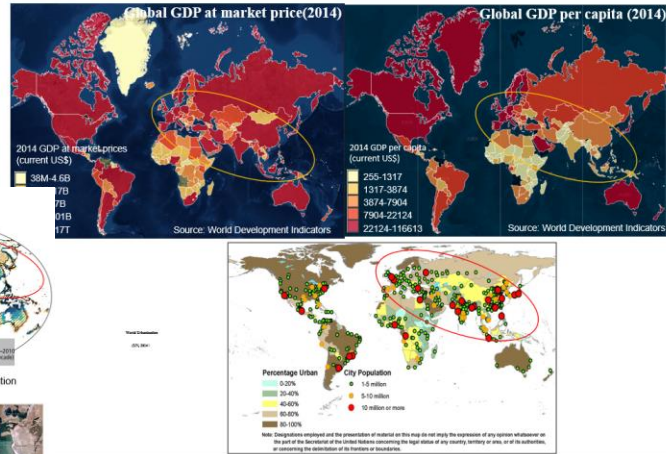
COUNCIL on
FOREIGN
RELATIONS

Common Challenges of Countries along BAR

Global Environmental Change

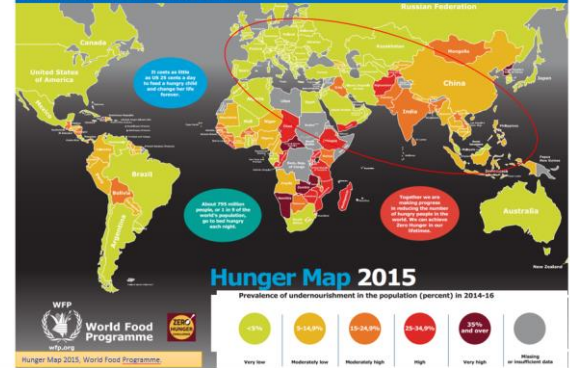


Unbalanced Economic and Urban Development



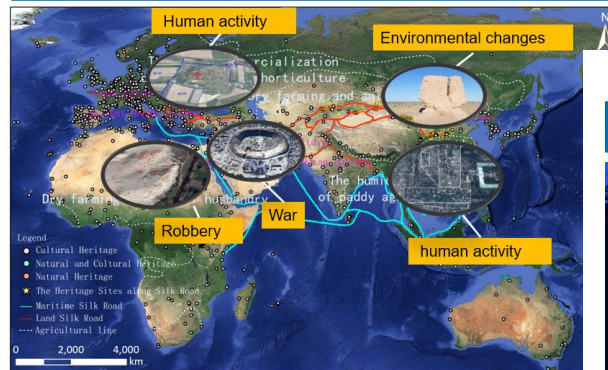
Food Security

One in nine people are undernourished in the world. Global change poses severe and distinct threats to food security in the countries along the Silk Road. The 60% of population produced 50% food.



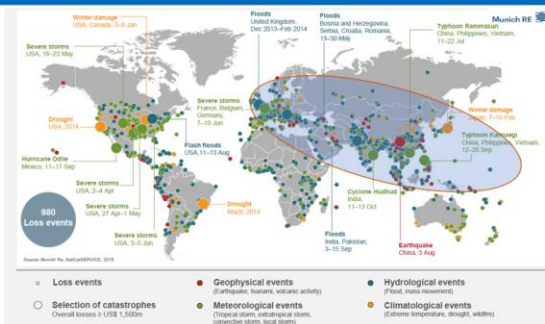
Cultural Heritage Protection

Cultural heritage protection along the Belt and Road is not optimistic, as mainly impacted or damaged by the environment change, weathering and pets, human activities and over-tourism, wars and illegal excavation.



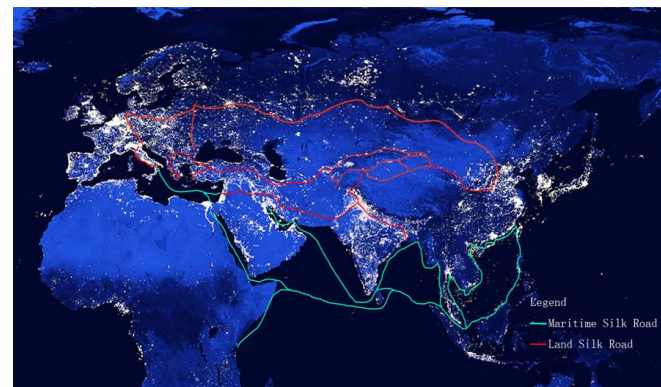
Severe Natural Hazards

High occurrences of hazards along the Belt and Road

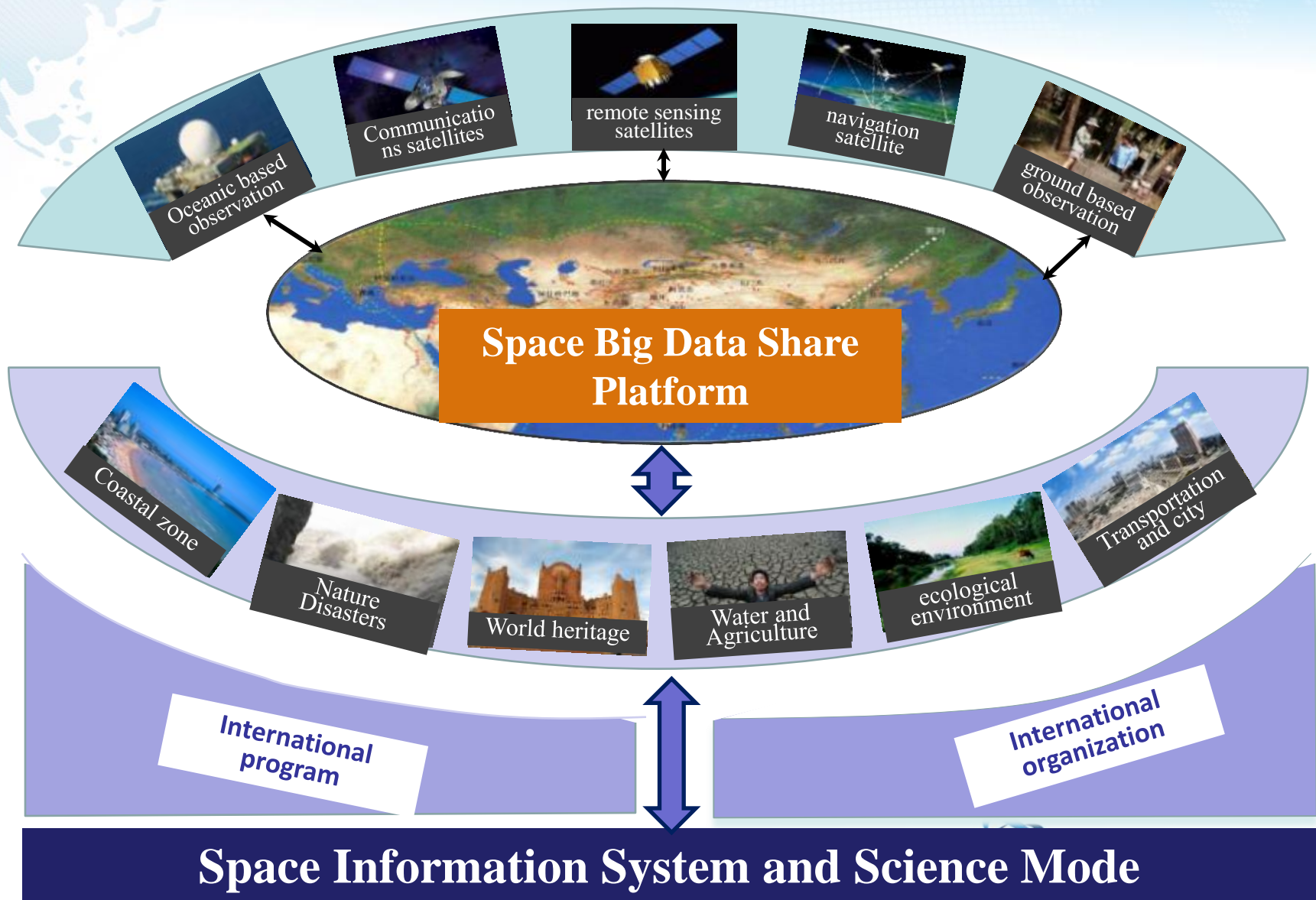


Unbalanced Development

This night satellite image shows that most countries along the Silk Road are in a "depression zone" between two economically developed regions.

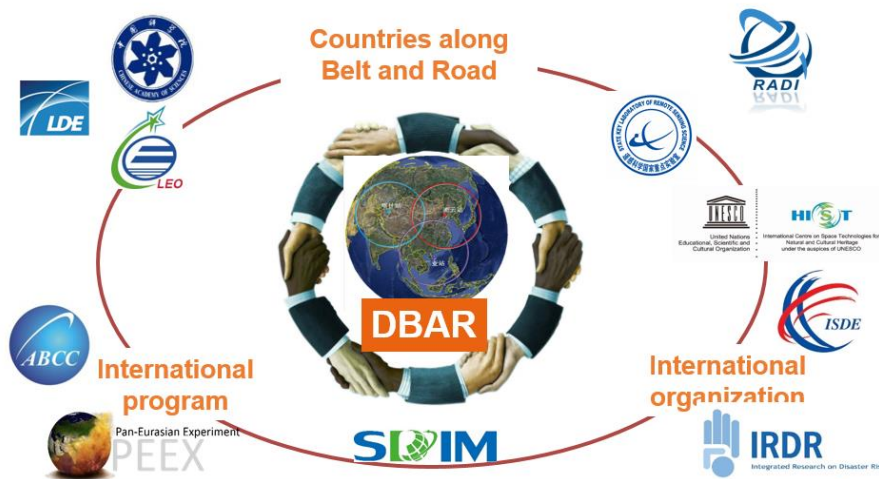


Digital Belt and Road (DBAR)



Vision of DBAR Initiative

DBAR: Hand in Hand Program

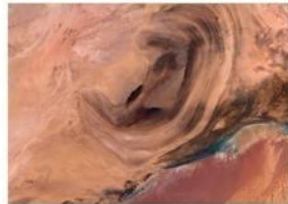


Let countries along BAR
benefit from DBAR

- Earlier, deeper and broader understand the belt and road to address common challenges as climate change, water resource, eco-environmental and food supply, in an integrative way.
- Build up scientific community for exchanging and sharing earth observation development and solution along the BAR countries, including capacity building.
- Strength and enhance Earth observation data infrastructure.
- Jointly promote Data sharing.



Thanks!



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