

# China's Remote Sensing from a Global View

— An Interview with CAS Member Prof. GUO Huadong

“While implementing the high-resolution Earth observation program, China will further launch new resource satellites for environmental, meteorological, and oceanic observations; meanwhile it will also launch a number of geoscience satellites and small satellites for different purposes,” CAS Member Prof. GUO Huadong, Chair of the 35<sup>th</sup> International Symposium on Remote Sensing of Environment (ISRSE35) and also head of the CAS Institute of Remote Sensing and Digital Earth (RADI), the host of the Symposium, shared with BCAS readership the latest progress and future roadmap of China's remote sensing in an interview with reporter SONG Jianlan. He also outlined China's contributions to international efforts to address global environmental change.



**Prof. GUO Huadong**

Director-General of the Chinese Academy of Sciences (CAS) Institute of Remote Sensing and Digital Earth (RADI), Member of CAS and the Academy of Sciences for the Developing World (TWAS). He presently serves as President of the International Council for Science (ICSU) Committee on Data for Science and Technology (CODATA), Secretary-General of the International Society for Digital Earth (ISDE), and Editor-in-Chief of the International Journal of Digital Earth (IJDE) published by Taylor & Francis. He has over thirty years of experience in remote sensing, specializing in radar for Earth observation and remote sensing applications, and involving research on digital Earth since the end of the last century. GUO has been Principle Investigator for over twenty major national projects or programs in China, and Principle Investigator for seven international radar remote sensing projects. He also serves as Director of the International Center on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO. He has published more than three-hundred papers and fifteen books, and is the principal awardee of thirteen national and CAS prizes, one being “National Outstanding Expert”, awarded by the State Council of China.

**BCAS:** *As you mentioned at the closing ceremony of the 35<sup>th</sup> International Symposium of Remote Sensing for Environment (ISRSE35), China just launched a new satellite for remote sensing on April 26. Would you give us a brief account of China's roadmap for developing Earth observation satellites?*

**GUO:** Yes, the satellite, called “GF-1”, launched on April 26 and is the first of a series of satellites for China's high-resolution system for Earth observation. It is also China's first LEO remote sensing satellite with a designed and evaluated life of more than five years. It is capable of obtaining panchromatic

images with spatial resolution of 2 meters, multispectral images at a resolution of 8 meters with an observational breadth of 60 kilometers, and multispectral images with a spatial resolution of 16 meters with an observational breadth of 800 kilometers. In the next seven years, the GF series of Earth observation satellites will be successively sent to space. While implementing the high-resolution Earth observation program, China will launch new resource satellites for environmental, meteorological, and oceanic observations; meanwhile it will also launch a number of geoscience satellites and small satellites for different purposes.



**BCAS:** *To what extent have these remote sensing satellites integrated into the global Earth observation system? Is data from these satellites available for the global community by any means?*

**GUO:** These satellites will be part of the global Earth observation system to a very large extent. So far we have had some of the satellite data shared by the international community, such as data from the resource satellites, environmental satellites, and meteorological satellites.

**BCAS:** *As we know, RADl has been running a data sharing program for Earth observations. Currently to what extent is data from China's satellites available for the international community? Is there any plan for further sharing of such observations with international users?*

**GUO:** Yes. RADl launched the medium-resolution satellite data sharing plan for Earth observations in 2011. In the next step, it will establish the China Landsat Data Center together with other domestic organizations. One of the Center's tasks is to share China's remote sensing satellite data with international users.

**BCAS:** *In your keynote speech at the ISRSE35, you mentioned an ABCC program titled "Remote Sensing for Global Change", which is an initiative of the Earth observation comparative research program on environmental change joining researchers from Australia, Brazil, Canada and China. What kind a role is China playing in the program? How will the data and end products from this program help us understand and address regional impacts of global environmental change at the Asia-Pacific level?*

**GUO:** China plays a vital role in the ABCC program, which was initiated by RADl and echoed by Australia, Brazil, and Canada. Scientists of China and the three countries are now effectively conducting a joint study, which has been accepted as part of the GEOSS program.

The key objective of the ABCC program is to produce data and information that is meaningful to global change research. Through this program, each participating country equally shares Earth observation data, which is vital for global change research for their own countries as well as the Asia-Pacific region.

**BCAS:** *"Future Earth" is an initiative promoted by ICSU to address the issue of global environmental change and global sustainability in the coming decades. How is China contributing to this joint enterprise?*

**GUO:** We human beings have only one Earth. China, as an essential part of this planet, is inseparable from the



CAS Member GUO Huadong chairing the 35<sup>th</sup> International Symposium on Remote Sensing of Environment. (Photo by courtesy of RADl)

Future Earth initiative. It contributes to the research of Future Earth in an all-round way, including the sharing and analysis of global Earth observation data.

**BCAS:** *Would you give us an overview of China's participation in global programs in the field of remote sensing for environmental change? How will China enhance its future participation in similar joint efforts?*

**GUO:** This year China is fully involved in four major global programs in the field of remote sensing for environmental change. It has also played an important role in remote sensing for global change. For example, it has participated in and undertaken some of the remote sensing projects for global change in the GEOSS program. China will have more cooperation with the international community in remote sensing for global change.

**BCAS:** *RADl made immediate responses to the Lushan Earthquake, which occurred just two days before the advent of the ISRSE35, and quickly obtained necessary data and end products for decision making and shared them with the public. At this very special point, are you satisfied with the performance of China's system of remote sensing for earthquake disaster mitigation, including its ability to respond to emergencies? What has secured its success in the latest efforts to mitigate the earthquake disaster? How will China or RADl improve this system in the future?*

**GUO:** In the wake of the Wenchuan, Yushu, and Lushan earthquakes, remote sensing technology played an effective role in seismic disaster monitoring and disaster assessment, and made great contributions to the country. The technical capability and the working mechanism, however, still need some improvement. Accordingly, we will further optimize the system of remote sensing for disaster emergency response and, especially, improve



Prof. GUO at the Panel Discussion on "Remote Sensing and Global Environmental Change" of the ISRSE35 with chair of the session Dr. Mario Hernandez (left) from the International Society for Digital Earth, and Ms. Barbara J. Ryan (right) from the Intergovernmental Group on Earth Observations (GEO). At this special brainstorming session panelists were invited to talk about global issues in the field of remote sensing and global environmental change. (Photo by SONG J)

our capability in new remote sensing technology, rapid disaster data acquisition and data transmission, among other aspects.

**BCAS:** *How do you view the special role of remote sensing in humanity's understanding and addressing the issue of sustainable development against the background of global environmental change?*

**GUO:** The issue of sustainable development against the background of global environmental change requires different theories and technologies. Remote sensing technology features macro, rapid, and accurate observation. This brings particularly great potential for applications in the study of global change and sustainable development, and sometimes makes remote sensing the best way to understand natural phenomena.

**BCAS:** *Would you introduce the implications and importance of the establishment of the Institute of Remote Sensing and Digital Earth (RADI), merging two former CAS institutions, the Center for Earth Observation and Digital Earth (CEODE) and the Institute of Remote Sensing Applications (IRSA)? How will the new entity serve new demands for disciplinary development and human welfare? What role will it play in promoting Earth observation and remote sensing in China and the world at large?*

**GUO:** After the integration of CEODE and IRSA, the new entity RADI has a dynamic scientific and technical

team of 1,200 members, including 700 researchers and 500 graduate students. RADI has become China's largest research institution in this field and more importantly, it has formed an orderly research system from the basic research on remote sensing and digital Earth to the R&D and application of technologies. It boasts four core competencies and competitive advantages: space-land integrated Earth observation, remote sensing research, global information analysis, and all-round international cooperation, and will play an important role in promoting the application and academic developments of remote sensing in China and the world.

**BCAS:** *As the Chair of the 35<sup>th</sup> International Symposium of Remote Sensing for Environment, to what extent do you think such a non-governmental forum will help with pooling resources from different nations and disciplines to deal with issues concerning global change?*

**GUO:** The most important role of such an international platform is academic exchanges. Scientists from more than 50 countries and regions are brought together to discuss issues on Earth observation and global environmental change, giving a key impetus to this field. Through exchanges, professionals and scholars of different countries and different specialties can learn about new data source channels and discover new scientific issues. This is very useful for the study and evaluation of global change, which is a common concern of mankind.