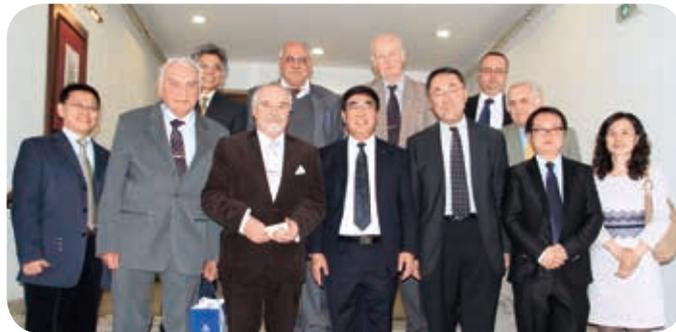




International Knowledge Centre  
for Engineering Sciences and Technology  
under the Auspices of UNESCO  
联合国教科文组织国际工程科技知识中心

# *Newsletter*

June 2015 No. 2



International Knowledge Centre for Engineering Sciences  
and Technology under the Auspices of UNESCO



**International Knowledge Centre  
for Engineering Sciences and Technology  
under the Auspices of UNESCO  
联合国教科文组织国际工程科技知识中心**

The International Knowledge Centre for Engineering Sciences and Technology (shortened as “IKCEST” ) is a category 2 centre under the auspices of the United Nations Educational, Scientific and Cultural Organization (shortened as “UNESCO” ). IKCEST was established on June 2, 2014. The Chinese Academy of Engineering is responsible for the operation and management of the IKCEST.

Under the auspices of UNESCO, IKCEST is a comprehensive and international knowledge centre devoted to the engineering sciences, technology and applied technology. IKCEST aims at connecting engineering sciences and technology institutions globally, assembling various digital resources relating to engineering sciences and technology, building up a public data service platform and corresponding service environment, and coordinating the building of various professional knowledge systems, thus providing knowledge-based services at a global scale in the form of consultancies, scientific research and education for policy-makers and engineering science and technology professionals in the world, with particular reference to the developing countries.

The specific tasks and functions of IKCEST are as follows: to establish an international engineering and technology resources hub; to establish a public data service platform, and to develop the technology for mining and analyzing knowledge from big data; to cooperatively build professional knowledge service systems, and to build capacity in developing countries; to foster interdisciplinary engineering talents with big data processing ability; and to assist UNESCO to fulfill its aims and support its action plans.

# CONTENTS

**Sponsored by:**

International Knowledge  
Centre for Engineering  
Sciences and Technology  
under the Auspices of  
UNESCO( IKCEST )

**Editor-in-chief:**

Yi Jian

**Managing Editor:**

Liu Chang

**Editors:**

Ma Yingchen Wang Guan  
Liu Hongyang Chen Yan  
Jin Yan Cao Jianfei  
Fu Zhijie

**Address:**

No.2 Bingjiaokou Hutong,  
Xicheng District, Beijing  
100088, P. R. China

**Tel:**

+86-10-59300230

**Fax:**

+86-10-59300230

## IKCEST News

- 04 IKCEST attended inaugural and first meeting of the Union of UNESCO Category 2 Centres in China
- 06 Programme specialists from UNESCO Beijing Office inspected IKCEST
- 08 IKCEST delegation visited Engineering Academy of the Czech Republic and attended UNECE meeting
  - 1) Delegation visited Engineering Academy of the Czech Republic
  - 2) Delegation attended the 6th Session of UNECE Expert Group on Resource Classification
- 12 IKCEST attended Regional Workshop of UNESCO Natural Sciences Related Centres and Chairs in Asia and the Pacific
- 17 China-Ukraine Workshop on Resources Classification: Status, Mapping and Application held in Beijing
- 19 First preparatory meeting for IKCEST International Symposium 2015 held in Beijing
- 20 IKCEST popularized science knowledge among young people

## CKCEST News

- 21 First working meeting of CKCEST in 2015 held in Hangzhou
- 21 Project management office completed inspection of sub-centre construction progress in 2014
- 22 Trial version of CKCEST knowledge service platform officially went online
- 22 Seminar on sub-centre development plan and metadata standards held in Beijing
- 23 Seminar on management of CKCEST assets and intellectual properties held in Beijing

## Top News for Big Data Era

- 24 Gartner: 5 reasons for a modern data centre strategy
- 24 Guiyang International Big Data Expo 2015 & Global Big Data Era Guiyang summit held in Guiyang
- 25 5 key big data trends to watch for in 2015
- 25 State council requires a greater role of big data in serving and supervising market players
- 25 China's big data market still in preliminary stage

## Terms on Big Data

- 26 Deep search
- 26 Unified search



## » IKCEST News

### IKCEST attended inaugural and first meeting of the Union of UNESCO Category 2 Centres in China

On April 1 2015, the Chinese National Commission for UNESCO (“the National Commission”) convened the inaugural and first meeting of the Union of UNESCO Category 2 Centres in China (“the Union”) at Beijing Minzu Hotel, which was attended by representatives from nine UNESCO Category 2 Centres and one applying centre in China.

The meeting’s main agenda included 1) voting for the first rotating centre and rotating chairperson of the Union; 2) deliberating on and adopting the Union’s Articles of Association; and 3) communication and discussion on subsequent work.

Shen Rong, Director of the Department of Science and Culture of the Chinese National Commission for UNESCO, introduced the background of the meeting. As China’s national strength gradually increases, there has been a rapid increase in the number of UNESCO Category 2 centres in China. In fact, China already has the largest number (nine) of UNESCO Category 2 centres in the world. Chinese President Xi Jinping paid a visit to UNESCO in last March, and Hao Ping, Chinese Vice Minister of Education, was appointed Chairman of UNESCO’s 37th General Conference.

These developments reflect the substantial improvement of China’s status in UNESCO. In this backdrop, there is an unprecedented opportunity of cooperation between China and UNESCO. The Union of UNESCO Category 2 Centres in China will provide a platform of communication for UNESCO Category 2 centres in China, facilitate interaction and collaboration among the centres, and increase the visibility and influence of China in the activities of UNESCO. The Chinese National Commission for UNESCO will provide full support for the Union.

Under the proposal of Du Yue, Secretary General of the National Commission for UNESCO, the meeting voted the International Centre on Space Technologies for Natural and Cultural Heritage (HIST) as the first rotating centre of the Union, HIST Director Guo Huadong as the Chairperson of the Union, and HIST Executive Deputy Director and Secretary General Hong Tianhua as the Secretary General of the Union. In his inaugural speech, Hong Tianhua expressed his thanks for the trust of the National Commission and other Category 2 centres in HIST and in himself as well as his commitment to providing quality services for members of the Union.

He stated that the UNESCO Category 2 centres in China are among the earliest and have the largest number, widest coverage and fastest growth and should join forces to drive educational, scientific and cultural causes and give full scope to their role as think tanks for the Chinese government to take part in the activities of UNESCO.

Du Yue pointed out that a number of recent events such as the establishment of the Asian Infrastructure Investment Bank and the convening of the Boao Forum for Asia have shown the rapid development of China, and that the establishment of the Union should help to reflect the role of China in the international community, institutionalize the management of UNESCO Category 2 centres in China, and create synergy through sharing of experience and information to drive the cooperation between China and UNESCO.

Representatives attending the meeting introduced missions of their respective centres, their major work, achievements as well as challenges, and shared views on how to innovate in development models, exert the role of think tanks, and strengthen cooperation with enterprises and interaction among Category 2 centres.

Through the nomination by the first rotating centre, the second rotating centre of the Union will be the World Heritage Institute of Training and Research for the Asia and the Pacific Region.

At the meeting, representatives of the International Knowledge Centre for Engineering Sciences and Technology (IKCEST) introduced the centre's major work, recent progress and work plan, and exchanged views with other representatives and officials of the National Commission on related matters.



IKCEST attended inaugural and first meeting of the Union of UNESCO Category 2 Centres in China



## Programme specialists from UNESCO Beijing Office inspected IKCEST

On the afternoon of April 17 2015, programme specialists from UNESCO Beijing office inspected IKCEST at its headquarters in the Chinese Academy of Engineering (CAE) in Beijing. At the meeting, Hans Dencker Thulstrup, Programme Specialist for Natural Sciences with the UNESCO Beijing Office and other officials were debriefed on the major progress of IKCEST and its work plan in 2015.

The meeting was attended by IKCEST Director-elect and CAE Member Zhong Zhihua, Deputy Director-elect Yi Jian, Gao Xiang, Pan Gang and Liu Chang at the IKCEST secretariat, Cao Xuejun, leader of the public platform development team, and other related personnel.

At the meeting, IKCEST played a video on its overview, and debriefed visiting specialists on the major progress of IKCEST after inauguration and its work plan in 2015, especially the progress in resource development, data aggregation, platform construction, and sub-system development, in addition to making an online demonstration of the system platform. After the debriefing, the two sides had discussions on related matters.

Hans expressed his excitement with the fruitful activities of IKCEST, including some overseas visits he himself recommended and facilitated. He expressed his appreciation and support of IKCEST's joint training program with the International Centre on Space Technologies for Natural and Cultural

Heritage (HIST) and the International Research Centre on Karst (IRCK). After learning that IKCEST will send representatives to the Regional Workshop of UNESCO Natural Sciences related Centres and Chairs in Asia and the Pacific to be held in Malaysia in May, he said he believed the workshop would promote mutual understanding of the centres and chairs and facilitate future cooperation. During the meeting, IKCEST and Hans discussed the opportunities and challenges facing IKCEST. Hans said that he would give his full assistance and support for the future activities of IKCEST.

Hans also made a suggestion that the international symposium and the international training program to be held in the fourth quarter of 2015 be arranged more compactly to increase the involvement and time efficiency of invited foreign experts to those activities.

At last, IKCEST Deputy Director-elect Yi Jian expressed thanks to the delegation headed by Hans for their visit and said that IKCEST would act on his suggestion to arrange the related activities more compactly so that foreign guests taking part in the training workshop could also attend the international symposium. Yi Jian also expressed thanks on behalf of IKCEST to UNESCO Beijing Office for the great support it has given to IKCEST and expected to maintain smooth communication with, and get further support from, UNESCO Beijing Office.



Programme specialists from UNESCO Beijing office inspected IKCEST



## IKCEST delegation visited Engineering Academy of the Czech Republic and attended UNECE meeting

In order to better facilitate the construction of the UNESCO Category 2 centre – the International Knowledge Centre for Engineering Sciences and Technology (“IKCEST”), strengthen the centre’s international reputation and influence and, specifically, get informed about the latest trends and developments in the energy field and explore possibilities of in-depth international cooperation on energy revolution consulting projects by leveraging the energy sub-centre of China Knowledge Centre for Engineering Sciences and Technology (CKCEST), CAE Member Xie Kechang led a delegation of IKCEST to the Czech Republic and Switzerland for academic exchange and discussion from April 26 to May 3, 2015.

### (I) Delegation Visited Engineering Academy of the Czech Republic

In the morning of 27 April 2015, the Chinese delegation visited the Engineering Academy of the Czech Republic (EACR) with the company of Feng Xuan, Counsellor for Science and Technology of the Chinese Embassy in the Czech Republic and his secretary Gu Min. EACR President Prof. Ing. Miroslav first extended a warm welcome to the delegation and had a detailed introduction to relevant aspects of EACR.

Later, the two sides held a seminar, attended by EACR President Prof. Ing. Miroslav, Vice President Prof. petr ZUNA, Secretary-General Prof. Ing. Milos, and a total ten academicians specializing in power

generation, nuclear power and energy. At the seminar, the two sides introduced their respective country’s energy production and consumption situation, national policy and strategy, and had in-depth discussion on such topics as climate change, environmental issue and economic issue as related to energy production and consumption.

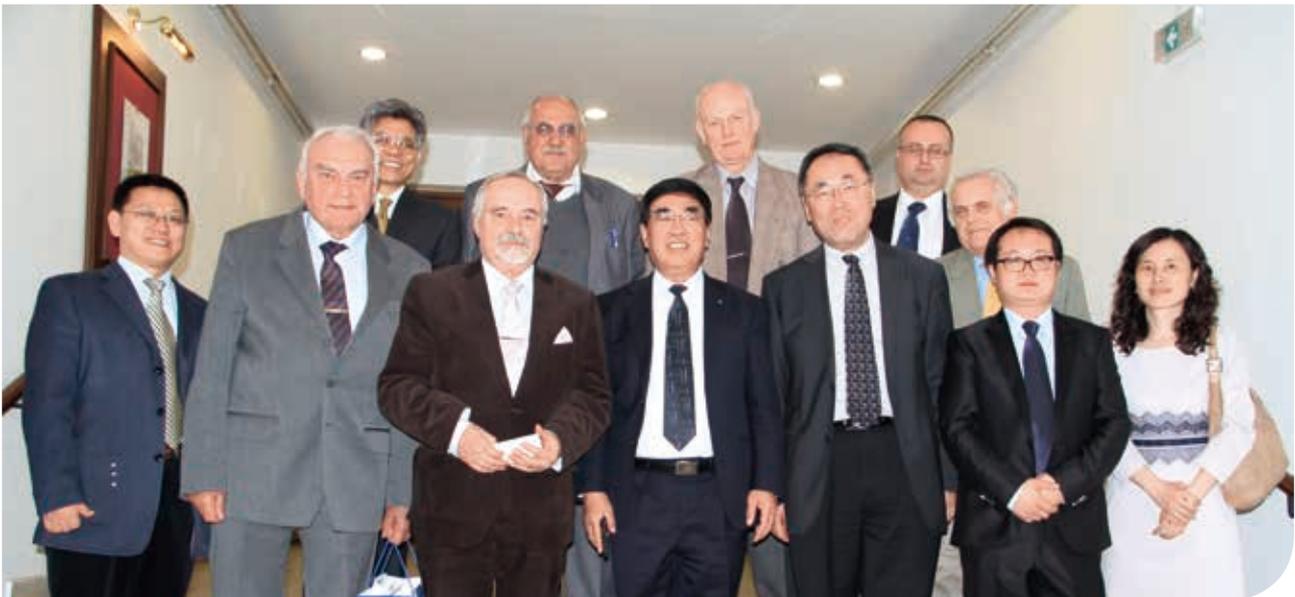
During the meeting, EACR President Prof. Ing. Miroslav said by way of introduction that the Czech Republic’s energy mix is made up of approximately 39% coal, 17% natural gas, 19% oil, 16% nuclear power, and 3% electricity export, with 50% being generated based on domestic resources.

CAE Member Xie Kechang also introduced China’s energy situation. Since its reform and opening up, China’s GDP increased 27.8 times from the level in 1990 to RMB 51.95 trillion, and it was driven by the production and consumption of a large amount of energy. In 2012, China consumed 3.62 billion tonnes of standard coal equivalent and produced 3.32 billion tonnes of standard coal equivalent, both ranking first in the world. China’s energy mix is dominated by fossil energy, especially coal (76.5%), due to China’s fossil energy resource structure which is rich in coal and short on oil and natural gas. In 2013, China’s consumption of non-fossil energy reached 9.8% of its total energy consumption, up from 8% in 2012, with the percentage of clean fossil energy consumption exceeding 5%.

CAE Member Xie Kechang also had an

introduction to IKCEST, saying that the centre focuses on aggregation of energy-related resources and development of knowledge applications based on them and is committed to serving national and international energy organizations and promoting the sharing and efficient utilization of resources globally. EACR academicians and experts attending the meeting showed a strong interest in and affirmation of the centre's mission and believed that the centre will make a huge contribution to the development of engineering sciences and technology.

Since 2000 when EACR and CAE signed a cooperation agreement, R&D and engineering personnel of the two countries has had fruitful exchange and cooperation in many fields including new material, engineering education and biotechnology. During the visit, EACR expressed interest in cooperating with CAE and IKCEST in the energy field. Besides, EACR experts also shared insights and suggestions for reference by the delegation in such aspects as improving energy efficiency along the entire industry chain, increasing



Delegation Visited Engineering Academy of the Czech Republic



the role of nuclear power in power generation, increasing the share of natural gas consumption, reducing coal consumption, developing intelligent grid, increasing the use of renewable energy, developing poly-generation and waste-to-energy, enhancing small-area heating systems, and integrating energy efficiency markets.

## **(II) Delegation Attended the 6th Session of UNECE Expert Group on Resource Classification in Geneva, Switzerland**

From 29 April to 1 May 2015, the IKCEST delegation attended at invitation the 6th Session of UNECE Expert Group on Resource Classification in Geneva, Switzerland, where CAE Member Xie Kechang made a keynote report entitled “IKCEST’s Idea and Vision of Knowledge Resources Convergence”.

The United Nations has always stressed the importance of sustainable development and the use of natural energy resources and actively promoted international and regional interaction and cooperation on classification of fossil energy and mineral reserves and resources. This UNECE expert group meeting was organized by the Committee on Sustainable Energy and the Expert Group on Resource Classification (EGRC) under the United Nations Economic Commission for Europe (UNECE) and attended by 102 authoritative technical experts from 32 countries (Russia, the United States, Canada, China, England, India, Brazil, Norway, Australia, Mexico, South Africa, etc.) in five continents, one UN organisation (International Atomic Energy Agency - IAEA), two intergovernmental organisations (CCOP and IEA), eight non-governmental organisations (AAPG, CRIRSCO, SPE, SPEE, WPC, EAGE, EFG, and

UK Coal Industry Alliance) and more than 30 other organizations or oil companies (SEC, AEC, ENI, Statoil, Shell, Total, Ross Petroleum, Addax Petroleum, D&M, IHS Global, RPS, TKI, etc.).

The meeting mainly discussed progress and experience of the energy resource classification system research, the latest disclosure requirements and trends of reporting of fossil energy and mineral reserves and resources, and progress of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources (UNFC). The Sustainable Energy Committee under UNECE has organized two revisions to UNFC and the latest UNFC-2009 has been put into trial implementation and test. The final documents of the General Rules and Application Guide will soon be released to solicit opinions of various parties.

The introduction to IKCEST was met with wide interest from many energy organizations, especially those from third world countries. Some experts from third world countries got into contact with the IKCEST delegation through various channels to explore cooperation with CAE on IKCEST in addition to expressing their support and appreciation of IKCEST’s mission. One representative from Ukraine expressed the hope of holding an academician seminar with IKCEST in China.

By attending the meeting, IKCEST accomplished the goals of preliminarily introducing itself to the world and laying a foundation for future communication and cooperation with other international and national organizations. Meanwhile, CAE will transplant the concepts and experience of developing CKCEST to the development of IKCEST and complete the tasks assigned by UNESCO in accordance with its requirements, making active efforts to contribute to the development of international engineering sciences and

technology, especially in third world countries in Asia, Africa and Latin America, including performing the responsibilities and duties of IKCEST as a UNESCO Category 2 centre in such aspects as personnel training, S&T education, sharing of resources,

and knowledge service. CAE will actively support IKCEST and promote the development engineering sciences and technology of UNESCO member states, especially developing countries, within the framework of UNESCO.



Delegation Attended the 6th Session of UNECE Expert Group on Resource Classification in Geneva, Switzerland



## IKCEST attended Regional Workshop of UNESCO Natural Sciences Related Centres and Chairs in Asia and the Pacific

The Regional Workshop of UNESCO Natural Sciences Related Centres and Chairs in Asia and the Pacific was held in Kuala Lumpur in Malaysia from May 26 to 27, 2015 with the aim of promoting interaction and knowledge exchange between UNESCO Category 2 centres and chairs in Asia and the Pacific.

The workshop was jointly organized by UNESCO Regional Science Bureau for Asia and the Pacific (UNESCO Office in Jakarta), Malaysia Funds-in-Trust (MFIT), the International Science, Technology and Innovation Centre for South-South Cooperation under the Auspices of UNESCO (ISTIC) and Universiti Teknologi Malaysia (UTM).

The workshop was attended by 120 representatives from Category 2 Centres and Chairs in Asia-Pacific as well as Africa, the Malaysian National Commission for UNESCO, UNESCO Office in Jakarta, and relevant Malaysian research institutes and universities.

The International Knowledge Centre for Engineering Sciences and Technology (IKCEST) sent its representative to the meeting who, speaking as one of the representatives of Category 2 centres, introduced the mission and current status of IKCEST and gained greater understanding and support for the centre. Through the meeting, IKCEST gained understanding of other Category 2 centres and chairs, opened up a platform of communication

and exchange with them, and preliminarily reached intentions of cooperation. The speaker also introduced the upcoming international symposium and international training workshop, laying some foundation for those events. Looking forward, IKCEST will contribute to the implementation of the Post-2015 Development Agenda.

### Background of the workshop

The current year 2015 is a critical moment globally for the transition into the Post-2015 Development Agenda as new framework for global development efforts. With the mandate to promote international cooperation in education, natural sciences, culture, communication and information, UNESCO's contribution to the Post-2015 Development Agenda is essential. UNESCO is mobilizing all its strength for building the sustainable, inclusive, knowledge societies needed for century ahead.

The draft of the Sustainable Development Goals (SDG) 'outcome document' includes 17 goals and 169 targets, where the universality of Science and its critical role for poverty eradication and sustainable development has been highlighted. Moreover, network will be critical in the implementation if the Post-2015 Development Agenda. The programmes of UNESCO in Natural Sciences have been able to expand their cooperation beyond the network

of the traditional intermediaries – what may be called the “UNESCO Natural Sciences family”: National Commissions, UNESCO Chairs, Category 2 Institutes and Centres, clubs and associations, National Committees of intergovernmental programmes and specialized networks, such as the Associated Schools Project Network.

Within this variety of partners, Category 2 Centres and Chairs play an important role as they expand the capacities and effectiveness to carry out activities, promote the outreach, impact and visibility at all levels, broaden the support base and mobilize resources, and create synergies among all communities of UNESCO.

In Asia and Pacific region, the Category 2 Centres and Chairs have the capacities to provide a tangible contribution towards the realization of not only Natural Sciences’ objectives and priorities as stated in the UNESCO Medium Term Strategy but also towards the implementation of the SDGs in the Post-2015 Development Agenda framework. The Category 2 Centres and Chairs can contribute by expanding and strengthening the UNESCO’s global and regional outreach, and providing a collective impact, given that the competencies, scope of expertise as well as training opportunities that they offer.

Their dissemination is also an added value to strengthen North-South, South-South and triangular cooperation. In that regards, Category 2 Centres and Chairs from Africa will also contribute to the workshop.

Therefore through the workshop, the Natural Sciences related Category 2 Centres and Chairs in Asia and the Pacific Region are expected to share knowledge and experience in order to broaden perspectives as well as to scope strategic areas for

cooperation.

This workshop is organized in order to promote interaction and knowledge exchange for strengthening South-South cooperation between UNESCO Natural Sciences related Category 2 Centres and Chairs in the Asia-Pacific Region. A strong and efficient Natural Sciences network in the region and globally will be critical to support the implementation of the Post-2015 Development Agenda in the upcoming years.

### **Programmes of the workshop**

The opening ceremony on May 26 was attended, among others, by Dato Ir. Lee Yee Cheong, Chairman, ISTIC Governing Board, Prof. Mohamed H. A. Hassan, Chairman, Council of the United Nations University (UNU), Prof. Dr. Ahmad Fauzi Ismail, Deputy Vice Chancellor (research and innovation) Universiti Teknologi Malaysia, Mr. Shahbaz Khan, OIC UNESCO Office Jakarta, and Mr. Mohad Khairul Adib bin Abdul Rahman, Secretary General of the Malaysian National Commission for UNESCO, who made welcome and opening remarks.

Mr. Shahbaz Khan, OIC UNESCO Office Jakarta, presented the “UNESCO Natural Sciences Regional Support Strategy 2014-2021” report (main contents including: Vision and Mission; Science for Peace and Sustainability: Post-2015 Development Challenges and Opportunities in the Region; The Role of Science, Technology and Innovation; STI Strategic Focus Areas; the Role of the Regional Science Bureau; Strategic Directions: Link with UNESCO’s Mid-Term Strategy; Regional Initiatives; Partnership: Forging Partnerships and Networks; Mobilizing the Wider UNESCO Sciences Family; Enabling Regional Science Support Strategy:



Planning, Monitoring and Evaluation; Resources; Ensuring Programme Effectiveness, Impact and Visibility). Malaysian government's higher education advisor Prof. Dato' Ir. Dr. Mohd Saleh Jaafar presented "Malaysia Higher Education Blueprint". ISTIC Governing Board Chairman Dato Ir. Lee Yee Cheong presented "Post-2015 development agenda and STI". The three reports provided a general background of the workshop.

After that, nine representatives of UNESCO Category 2 centres in Asia-Pacific as well as Africa made speeches by turn, introducing their respective centres' basic information, main activities and achievements. The nine representatives were Dato Samsudin from ISTIC; Jie Liu from International Centre on Space Technologies for Natural and Cultural Heritage (HIST), China; Labbaf, the International Center on Qanats & Historic Hydraulic Structures (ICQHS), Iran; Dr Yaya, Regional Centre for Integrated River Basin Management (RC-IRBM), Nigeria; Harjono, Asia Pacific Centre for Ecohydrology (APCE), Indonesia; Dr. Chang Liu, IKCEST, China; Dr. Khakbaz, Isfahan Regional Center for Technology Incubators and Science Park Development (IRIS), Iran; Lekoomet, KWI, Kenya; and Dr Rooseli, Regional Humid Tropics Hydrology and Water Resources Centre for South-East Asia and the Pacific (HTC Kuala Lumpur), Malaysia, respectively.

Then six representatives of UNESCO chairs in Asia-Pacific and Africa made speeches by turn, introducing their main activities. They were Dr Pachauri, India; Dr Matsumoto, Japan; Prof. Sarrafzadeh, Iran; Dr Kesavan, India; Dr Kantoush, Sudan; and Dr Fayzullaev, Uzbekistan, respectively.

The speeches by the 15 representatives of natural sciences related UNESCO Category 2

centres and chairs were followed by interaction among the representatives and then the Q&A session which further strengthened mutual understanding among the centres and chairs and opened up channels for future cooperation.

On the second day, the attendees were divided into three groups to discuss three topics before the outcomes of discussion were submitted to the meeting. The three topics were as follows: Develop a Strategic Plan for UNESCO Natural Sciences Related Centres and Chairs in Asia and The Pacific; Scoping UNESCO Natural Sciences Centers and Chairs in Malaysia; and Delivering Together.

The three groups had heated discussions on their respective topics and submitted their outcomes to the meeting, and they also communicated and discussed with other groups. The discussions generated many constructive ideas on how to strengthen cooperation among UNESCO natural sciences related centres and chairs in Asia and the Pacific to support the implementation of the Post-2015 Development Agenda. Members of the UNESCO Natural Sciences family reached a preliminary consensus on a number of issues including website linkage, collaborative research, joint actions and personnel exchange.

Shahbaz Khan, OIC UNESCO Office Jakarta, made the concluding speech "Plan of Action and Follow-up". And then Ms. Flavia Schlegel, UNESCO Assistant Director General for Natural Sciences, made closing remarks. She expressed her pleasure of attending the meeting and gladness at finding that there are so many women engaged in the natural science work, noting that UNESCO has a particular concern for gender equality and equal rights for women and that it is of great significance to create platforms and conditions for women to

engage in scientific research. She expressed thanks and congratulations for the specific and tangible contributions made by the many UNESCO Category 2 centres and chairs and affirmed the inclusion of some Category 2 centres and chairs in Africa in the meeting, deeming it to be of great “strategic significance”. “Without you, the headquarters would count for nothing, and the same would also be true for you without the headquarters”, said Ms. Schlefel, underscoring the close and mutually interdependent relationship between the UNESCO headquarters and the many UNESCO Category 2 centres and chairs around the world. Ms. Schlefel encouraged all attendees to contribute to the implementation of the Post-2015 Development Agenda and the accomplishment of its goals. She called for greater cooperation among UNESCO natural sciences related Category 2 centres and chairs in Asia and the Pacific to increase collective and joint impact. She said that the workshop was convened at the perfect time and that the closer ties and cooperation it helped forge among the regional Category 2 centres, chairs and national commissions for UNESCO will provide a strong support for the accomplishment of the Post-2015 Development Agenda. She hoped that the workshop will shed light on other regions and that the UNESCO Category 2 centres and chairs in Asia and the Pacific will provide a paradigm of regional cooperation for their counterparts in other regions. Ms. Schlefel concluded by saying that she would give full support for the subsequent actions by the Category 2 centres and chairs in Asia and the

Pacific (members of the UNESCO Natural Sciences family).

### **IKCEST at the workshop**

At the meeting, representative of IKCEST introduced the centre’s mission, goals and current status and expressed the wish to cooperate with other Category 2 centres and chairs.

In her presentation, Liu first explained the three backgrounds and reasons behind the establishment of the centre. She also outlined the five major tasks to be completed by IKCEST. Liu then introduced the Chinese Academy of Engineering (CAE), the highest honorary and advisory academic institution in engineering sciences and technology in China, which is responsible for the management and operation of IKCEST. And she briefed on the main activities the centre has completed after the signing and unveiling ceremony.

Finally, she introduced several major activities that the centre will soon commence, including an international symposium on big data scheduled for November 2015, and an international training workshop on big data scheduled for December. She invited other Category 2 centres to send representatives to participate in relevant activities and expressed IKCEST’s wish to strengthen cooperation with other centres and chairs.

Her information was met with great enthusiasm and affirmation from other attending representatives. Representatives of a number of Category 2 centres proactively contacted IKCEST to express their interest in future cooperation with the centre.



IKCEST attended Regional Workshop of UNESCO Natural Sciences Related Centres and Chairs in Asia and the Pacific

## China-Ukraine Workshop on Resources Classification: Status, Mapping and Application held in Beijing

China-Ukraine Workshop on Resources Classification: Status, Mapping and Application was held in Beijing from June 1 to 3, 2015. The workshop was jointly organized by the International Knowledge Centre for Engineering Sciences and Technology (IKCEST), under the auspices of UNESCO, the Resources and Reserves Evaluation Center under the Ministry of Land Resources, State Commission of Ukraine on Mineral Resources and CNPC Research Institute of Petroleum Exploration and Development.

On June 1, Prof. Chen Ling of Zhejiang University, also a member of IKCEST's research team, gave a lecture titled "The era of big data" to the participants of the workshop. Prof. Chen briefed the audience on the big data's latest development, technology trend and prospect of application and engaged in intensive

discussions based on practical application of big data in corporate management and data classification.

The workshop was held on June 2-3 at the CNPC Research Institute of Petroleum Exploration and Development's conference room. Zhang Dawei, Director of the Resources and Reserves Evaluation Center, and Georgii Rudko, Chairman of State Commission of Ukraine on Mineral Resources, attended and addressed the meeting. A total of 12 speakers from China and Ukraine made reports about the two countries' management of mineral resource reserves, classification of mineral resources and petroleum, shale gas exploration and the study of international classification system. The audience, based on their respective professions and interested areas, exchanged ideas with the speakers



China-Ukraine Workshop on Resources Classification: Status, Mapping and Application held in Beijing

and discussed the two countries' similarities and differences in the related areas. Tian Yajun, technical director of IKCEST energy sub-system and a senior engineer at the National Institute of Clean-and-Low-Carbon Energy (NICE) of China, delivered a report entitled Construction Principle and Service Outlook of Professional Knowledge Service System on Energy (taking coal resource classification as an example). After the report, he made in-depth exchanges with the

audience and received positive feedback.

The successful conclusion of the workshop strengthened reciprocal cooperation between China and Ukraine and complemented the respective advantages in the field of mineral resources. It also elevated IKCEST's international influence, expanded its communications with external organizations and laid a solid foundation for future exchange and cooperation with domestic and foreign institutions.



China-Ukraine Workshop on Resources Classification: Status, Mapping and Application held in Beijing

## First preparatory meeting for IKCEST International Symposium 2015 held in Beijing

The first preparatory meeting for the 2015 International Knowledge Centre for Engineering Sciences and Technology (IKCEST) Symposium was held in Beijing Conference Centre on the evening of June 9, 2015.

Chaired by Prof. Chen Zuoning, Vice President of the Chinese Academy of Engineering (CAE), the meeting was attended by CAE Members Pan Yunhe, Li Guojie and Wu Jiangxing, and Yi Jian, Director of CKCEST's project management office, Xu Jin, Deputy Director-General of the Department of International Cooperation, CAE, as well as staff from relevant departments of the CAE and IKCEST secretariat.

On behalf of IKCEST Secretariat, Mr. Yi Jian introduced the preliminary proposal for the symposium and made a detailed account of its theme, topics and audience list. Participants

of the meeting engaged in extensive and exhaustive discussions and reached the following consensuses:

1. The conference is initially named as IKCEST International Symposium 2015 and is scheduled to be held on November 18. The first session of the first Governing Board of IKCEST and the first session of the first Advisory Committee of IKCEST are planned to be held on the afternoon of November 17.

2. The symposium is themed on "Digital Knowledge for Science and Engineering", and the two sub-themes will be "Digital Knowledge for Science" and "Digital Knowledge for Engineering" respectively.

3. Prof. Raj Reddy recommended five expatriate experts as foreign members of the symposium's program committee. Vice President



First preparatory meeting for IKCEST International Symposium 2015 held in Beijing



Chen Zuoning and the three CAE members analyzed the five experts' research areas and unanimously concluded that they are qualified to join the program committee, since their expertise is related to the practical application of digital knowledge and matches the theme of the symposium. Chinese members of the program committee were also determined.

4. The symposium will invite some foreign members of the program committee to make

keynote speeches on the practical applications of digital knowledge. CAE Members and experts from sub-systems of IKCEST would also be invited as speakers. Each speaker will have 25 minutes for his or her speech. Panel discussions will follow.

5. Participants of the meeting plan to invite Prof. Zhou Ji, President of the CAE, to make opening speech and Vice President Chen Zuoning to address the closing session.

## IKCEST popularized science knowledge among young people

In order to accommodate the Campaign on "Teenagers Go into the Chinese Academy of Engineering (CAE)" launched by the CAE, the International Knowledge Centre for Engineering Sciences and Technology (IKCEST) was open to youngsters on April 3, 10, 17 and 24, May 15, 22 and 29, June 1, 19 and 26 respectively, in order to introduce the concepts of building the centre and popularize related science knowledge.



"Teenagers Go into the Chinese Academy of Engineering" campaign — visiting IKCEST Headquarter

## » CKCEST News

The China Knowledge Centre for Engineering Sciences and Technology (CKCEST) is a significant part of and vital support for the International Knowledge Centre for Engineering Sciences and Technology (IKCEST).

### First working meeting of CKCEST in 2015 held in Hangzhou

On April 1 and 2, 2015, the first working meeting of CKCEST in 2015 was held in Hangzhou, Zhejiang Province, which was chaired by CAE Vice President Chen Zuoning and attended by CAE Honorary Chairman Xu Kuangdi, former CAE Executive Vice President Pan Yunhe, Zhejiang University President Wu Zhaohui, and representatives of CKCEST project management office and CKCEST's technology team, platform development team, resources team and some sub-centres.

After hearing the report on the progress of the CKCEST, CAE Honorary Chairman Xu Kuangdi spoke highly of its achievements and hoped that it would make further progress. At the meeting, academician Pan Yunhe and Vice President Chen Zuoning gave specific instructions on CKCEST's subsequent work.

### Project management office completed inspection of sub-centre construction progress in 2014

From April 20 to May 8, the Project Management Office of CKCEST conducted an inspection on the progress of five sub-centres on environment, geology, information technology, innovative design and learned journals, respectively, which were newly launched in 2014. The sub-centres reported their construction progress and plans in 2015.



## Trial version of CKCEST knowledge service platform officially went online

On June 8, 2015, the trial version of CKCEST Knowledge Service Platform was put online and made available to all CAE Members during the first round of review of new CAE Member nominees.

At the CAE Member nominee review meeting, CAE Member Pan Yunhe introduced the development of CKCEST, including the centre's background, purpose, technology framework and scope of contents. After three years' development, CKCEST's knowledge service platform has aggregated 750 million data entries including specialized books, journal papers and conference papers, more than 700 data sets in engineering sciences and technology, more than 17 million encyclopedic entries, and more than 10 million entries of academic and expert related information, in addition to 26 specially developed knowledge applications. The knowledge service systems of seven sub-centres which were put online this time will provide users with extensive services including data discovery, expert discovery and collaborative working platform. The project team created access accounts with the highest permission level for all CAE Members, and related service telephone numbers and email addresses were also announced in order to provide CAE Members and R&D personnel in engineering sciences and technology with online and offline services. Prof. Pan Yunhe said that as the system was just put into trial use, it certainly had various imperfections and inadequacies. He asked all CAE Members using the platform to share their valuable opinions and suggestions so that the platform can be improved constantly.

## Seminar on sub-centre development plan and metadata standards held in Beijing

On June 19, a seminar on sub-centre development plan and metadata standards organized by the CKCEST Project Management Office was held at the Agriculture Information Institute under the Chinese Academy of Agricultural Sciences. The meeting was attended by, among others, CaiZhiyong from China National Chemical Information Centre, Mao Yiming from China Iron & Steel Research Institute Group, Li Chunmeng from China Metallurgical Information and Standardization Institute, Wang Juanle from the Institute of Geographic Sciences and Natural Resources Research under the Chinese Academy of Sciences and Jiao Yi from the Electronic Technology Information Research Institute under the Ministry of Industry and Information Technology.

At the meeting, Zhao Ruixue, director of the Agriculture Information Institute, Dr Kou Yuantao and Dr Xian Guojian delivered reports and had full discussions with other experts at the meeting on the subject matters of their reports. Attendees also shared opinions and suggestions on revision of the sub-centre development framework.

## Seminar on management of CKCEST assets and intellectual properties held in Beijing

On June 23, the Project Management Office and its Resource team held a seminar on the Administrative Measures of CKCEST for Assets and Archives and the Administrative Measures of CKCEST for Intellectual Property Rights at the China National Chemical Information Centre. The Project Management Office is actively preparing the formulation of relevant rules including the Administrative Measures of CKCEST for Assets, the Administrative Measures of CKCEST for Archives and the Administrative Measures of CKCEST for Intellectual Property Rights, in accordance with CKCEST's overall implementation plan, in order to implement the centre's management system and increase the standardization, professionalism and coordination of the centre's asset, archive and intellectual property management.



## »» Top News for Big Data Era

### Gartner: 5 reasons for a modern data centre strategy

Gartner recently highlighted five reasons why a modern data centre strategy is needed for the digital world: 1) to make the data centre behave more like a factory and a laboratory; 2) to manage the pressure on the data centre to become agile and innovative; 3) to manage different types of risk; 4) to make the data centre part of a broader hybrid topology; and 5) to embrace new technologies in a different way.

Source: ZDNet China

### Guiyang International Big Data Expo 2015 & Global Big Data Era Guiyang summit held in Guiyang

From May 26 to 29, 2015, the Guiyang International Big Data Expo 2015 & Global Big Data Era Guiyang Summit was held under the theme of “Revolution, Opportunity and Challenge in the Big Data Era” in Guiyang, Guizhou Province, which provided a comprehensive picture of big data technologies, applications and development trends through various activities including exhibition, summit forum and innovation competition.

Source: People's Daily Online

### 5 key big data trends to watch for in 2015

John Schroeder, CEO and co-founder of Hadoop distribution specialist MapR, recently forecasted that five major advances would drive Big Data in 2015. These include: 1) data agility emerges as a top focus; 2) organizations move from data lakes to processing data platforms; 3) self-service big data goes mainstream; 4) Hadoop vendor consolidation: new business models evolve; and 5) enterprise architects separate the big hype from big data.

Source: eNet

### State council requires a greater role of big data in serving and supervising market players

Recently the General Office of the State Council issued the Several Opinions on Utilizing Big Data to Strengthen Service for and Supervision on Market Players, requiring giving full scope to modern information technologies including big data and cloud computing in building the social credit system, government transparency and data openness to improve government service, promote fair market competition, release vigor of market players, and further improve the development environment.

Source: Xinhuanet

### China's big data market still in preliminary stage

According to the recently released China Big Data Development Report (2015), China's big data market reached RMB 8.4 billion in 2014 and is expected to increase by 38% to RMB 11.6 billion in 2015. Compared to China's RMB 15 trillion worth information technology market in 2014, the big data is a very tiny market and still in its preliminary stage of development.

Source: China Network of Information Industry (CNII)



# »» Terms on Big Data

## Deep search

Deep search: refers to a search technology which not only crawls and indexes Internet resources but also expands the breadth and depth of search by aggregating Internet resources, professional data sources and digital libraries and leveraging emerging technologies such as mass collaboration and crowdsourcing, knowledge network and data mining and in-depth understanding of user intents informed by semantic analysis, and presents search results visually and multi-dimensionally as knowledge. As pointed out by CAE Member Pan Yunhe at a working meeting of CKCEST, deep search is different from conventional search engines in that, first of all, it supports unified retrieval of multiple data sources and data structures (structured and unstructured), and secondly, its search results are not merely data or information, but also include various types of knowledge, including the relationships between different attributes (between concepts and concepts, concepts and people, and concepts and organizations, etc.).

## Unified search

Unified search: refers to the integrated search technology which enables the users to search information across multiple data sources and search engines through a unified search interface. CKCEST's near-term goal is to achieve cross-database search of heterogeneous data resources in different fields, and unified search is a key technology to achieve cross-database search. Support of unified search is one of the basic requirements for all CKCEST knowledge service sub-systems. In implementing this function, CKCEST sub-centres may refer to the Reference Specification of Meta-Search Service (Version 2.0).





**International Knowledge Centre for Engineering Sciences  
and Technology under the Auspices of UNESCO**

Address: No.2 Bingjiaokou Hutong, Xicheng District, Beijing 100088, P. R. China

Tel: +86-10-59300230

Fax: +86-10-59300230

E-mail: [information@ikcest.org](mailto:information@ikcest.org)

Website: [www.ikcest.org](http://www.ikcest.org)