



# INTERNATIONAL UNION OF GEOLOGICAL SCIENCES

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# 2017 REPORT

*Fostering a global voice for the geosciences*

In association with ICSU and UNESCO  
120+ adhering organizations  
50+ affiliated organizations



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Acknowledgement

## THE UNION'S AIMS

The International Union of Geological Sciences (IUGS) was founded in 1961 with the mission to unite the global geological community in promoting development of the earth sciences.

The Union is the largest member organizations (about 1 million earth scientists) of the International Council for Science (ICSU) and one of the world's largest scientific organizations.

### Origins

In 2012, IUGS redefined its missions according to a new Strategic Plan:

- Produce authoritative scientific standards
- Contribute to earth science education and public understanding of geosciences
- Represent the geological sciences in forums and decision-makers
- Encourage and support new original ideas in basic and applied geological research
- Foster collaboration between developed and developing countries in earth science research, capacity building, and applications
- Encourage more interdisciplinary involvement within the broad spectrum of the geosciences.

### 2012 Strategic Plan

For the period 2017, the Union had the following aims:

- Encourage and substantiate the participation of the Adhering organizations and National Committees in promoting Geosciences
- Develop initiatives, (i.e. Resourcing Future Generations, Forensic Geology) of wide societal and applied interest
- Renew and establish closer links to UNESCO, ICSU, and Geo-Unions, as well as develop new initiatives together with these organizations
- Improve visibility of IUGS through publications and presence at scientific forums.

### Present Strategic Plan

## GOVERNING THE UNION

### The Council

Meets every four years at the International Geological Congress

Representatives appointed by the Adhering Organizations from the active IUGS member countries/regions

Inactive or non-member countries/regions may send observers (without voting rights) to Council meetings

### Executive Committee (2016-2020)

#### Bureau

Day-to-day decisions and responsibilities

Secretary General



Prof. Dr. Stanley FINNEY

President



Prof. Dr. Qiuming CHENG

Treasurer



Prof. Hiroshi KITAZATO

Past President



Prof. Dr. Roland OBERHÄNSLI

Vice Presidents



Dr. Kristine ASCH



Prof. William CAVAZZA

Councilors (2014-2018)



Amel BARICH



Prof. Stephen JOHNSTON

Councilors (2016-2020)



Prof. Ben MAPANI



Edmund NICKLESS

## Prof. Dr. Qiuming CHENG



### PRESIDENT (2016-2020)

As I prepared this annual report, I realized it happened to be the 10th anniversary of the Wenchuan Earthquake, a horrible tragedy measuring a magnitude of 8 which killed over 70 thousand people and left several million people homeless. The commemorative activities from the earthquake should serve as a reminder to the whole world that it is indeed very urgent to further advance geoscience in order to enhance our understanding of our planet. Making headway in our ability to develop new technology for our protection is paramount. That being said, I would like to take this opportunity to congratulate the organizations and geoscientists whose efforts have led to major progress in various fields of geosciences. I would also like to mention a few examples as reported by the journal Nature in 2017: the IUGS - Resourcing Future Generations initiative group presented an interdisciplinary perspective on how best to ensure ecologically viable continuity of global mineral supply over the coming decades; Experimental geologists are joining efforts to understand what it takes to form habitable planets; Recognition of the divergent fates of primitive hydrosphere water and new knowledge about the early hydrological cycles on Earth and Mars; Geological evidence confirmed the theory of chaotic earth orbital variations which enables a more precise and accurate geological timescale to be produced; Numerical models of global thermochemical convection associated with magmatic processes developed to study the geodynamic regime of early Earth; New data from borehole drilling revealed that highly anomalous fluid pressure and temperature gradients at active plate-bounding faults control mineralization and the distribution of earthquakes. These scientific advancements indicate that geoscience

is entering a new era for real-time earth system innovation with the modern space, earth and ocean observation and exploration networks, lab analytical and experimental facilities, as well as big data computing and mathematical simulation.

Following the priorities set for 2017, President Cheng's emphases in the past year was in promoting IUGS in both science and membership point of views. He encourages international collaboration on studying converging plate boundary dynamics and their effects on natural resources, environment, hazards and human resilience. President Cheng attended numerous conferences and activities to convince nations and organizations to join IUGS with the hopes of sharing new knowledge and developing cutting-edge technology to tackle global issues as well as problems facing their countries under the global tectonic framework. Brief highlights are given below:

- Bureau meeting held in Paris Feb 15;
- The 71th EC meeting held in UNSECO Headquarter Paris Feb. 15 to 18;
- Forum for 21th Century Strategic Plan for Tectonics in Xian, China April 17-18;
- EGU in Vienna April 23-28.
- Bureau meeting held in Long Beach, USA June 4-8;
- International Geoscience and Geoparks Programme (IGGP) council meeting at the UNESCO headquarter in Paris Feb 20-22;
- China - ASEAN Mining Cooperation Forum in Nanning, China August 23-26;

- Meeting with leaders from Geological Survey of Canada (GSC) and China Geological Survey (CGS) in Beijing September 19;

- China Mining Congress and Expo in Tianjin, China September 23-25;

- 32nd ICSU General Assembly in Taipei October 22-23;

- Bureau meeting held in Seattle at GSA, USA October 24-25;

- The Sixth Chinese National Conference on Sedimentology in Nanjing, China October 28-29;

- Visiting the Indian venue for the 36th IGC Nov. 20-24.

#### Communication and Interaction with IUGS Constituent Groups and Improve Visibility of IUGS

The 71st EC meeting was successfully held at UNESCO headquarters in Paris Feb. 15 -18 with support from UNESCO, the French National Committee to IUGS, French Geological Society, and the Commission for the Geological Map of the World (CGMW). In-depth discussions among the 50 participants were devoted to not only ongoing IUGS activities, but also, to promote new initiatives aimed at enhancing IUGS' global visibility and influence in the coming years.

Various opportunities were taken to interact with adhering members of IUGS and other constituent groups and to increase the visibility of IUGS. For example, the Journal Episodes, published quarterly, issues articles, forums, IGCP reports and news from IUGS's constituent groups, E-Bulletins distributed to all constituent groups monthly to provide updates IUGS, booth exhibitions set up in large conferences including AGU, EGU, CGU, GSA, China Mining Forum etc. In addition, a bureau meeting was held at the Geological Society of America (GSA) Annual conference in Seattle, which provided an excellent opportunity for interactions between representatives of adhering members from US, Germany, UK, Canada and China. Many valuable suggestions on improving communications between IUGS

and its Adhering Organizations were discussed. President Cheng also delivered a presentation at the GSA council meeting. Throughout the year, President Cheng had personal exchanges with leaders of National Committees to IUGS including China, US, UK, Germany, France, Japan, Russian, India, Canada, Turkey and many others. Their suggestions and comments regarding strengthening participation and engagement between all members of IUGS are greatly appreciated.

#### Collaboration with ICSU, UNESCO, IGC, RFG2018 and Other Organizations

**ICSU:** IUGS actively participates in the process of merging ICSU and ISSC. President Cheng and former President Professor Roland Oberhaensli attended the ICSU Extraordinary General Assembly in Oslo on October 24, 2016, where and when the merging process was initialized. President Cheng and Vice President Professor William Cavazza, participated in the 32nd ICSU GA in Taipei October 23 – 24, 2017. The final decision was reached in favor of merging the two into a new International Science Council (ISC). GeoUnions expressed their collective comments regarding this merge. Election of new councilors for ISC will be conducted in July 2018 in Paris.

**UNESCO:** In 2017, 20 IGCP projects were funded by UNESCO and IUGS which involved 135 leaders from 110 different countries. About half of all participants of the projects are either young researchers or those from developing nations. The Program currently covers five themes: Earth Resources; Global Change; Geohazards; Hydrogeology; and Geodynamic. At the IGCP council meeting, President Cheng encouraged raising funds to increase support to the IGCP. He also suggested to seek further support to establish a large scale IGCP, super IGCP, focusing on a major scientific problem of transdisciplinary nature covering several or all five themes aforementioned. President Cheng also suggested the possibility to set up other series of global networks such as Geoheritage, Geomuseum, Geolab and Centers of Excellence in addition to the current Global GEOPARK.

**IUGS-IUGG:** IUGS and IUGG explored opportunities to jointly support and facilitate collaboration on transdisciplinary research such as “The Ocean Realm”. Beside future congresses, other form of joint sessions on the common topic are encouraged to be offered in existing conferences within each Union’s congresses IUGS (2020/2024) and IUGG (2019/2023) and at EGU and AGU as suggested by IUGS Vice President Kristine Asch, who has communicated with IUGG on this initiative.

**IGCs:** The 36th IGC has released its first circular which includes more than 40 themes and 50 field trips and short course, etc. The IUGS Bureau members visited the venue for the 36th IGC on Nov. 20-24 and exchanged with the LOC and leaders of Ministry of Mines, Ministry of Earth Sciences, Indian National Science Academy (INSA), Geological Survey of India (GSI), and Indian National Committee to IUGS. Both sides had fruitful discussions regarding the 36th IGC and further collaboration between IUGS and India. Calls are now open to proposals regarding the 36th IGC.

**RFG2018:** The conference information and promotional materials were widely spread via the IUGS journal, website, E-Bulletins and booth exhibitions at various conferences. A MOU was signed between IUGS and LOC of RFG2018. President Cheng has introduced RFG2018 on various occasions and specific efforts were taken to bring leaders from geological surveys to the sessions under the theme of the Changing Role of Geological Surveys. President Cheng, Secretary General Stanley Finny and Vice President Kristine Asch are all invited to give talks. In his talk entitled “How will Big Data technologies change Earth science research?”, President Cheng will be elaborating on the proposal of big data and geo-intelligence for converging plate boundary dynamics and effects on resources, environment and hazards.

#### **Promoting Geosciences and Develop New Initiative of Wide Societal and Applied Interest**

Regarding new scientific initiatives, several potential areas have been considered by Presi-

dent Cheng. Such areas may include big data discoveries for resourcing future generations especially for supporting Africa’s sustainable resources economy, big science on converging plate boundaries dynamics and effects on resources, environment and hazards, as well as other nontraditional and postindustrial geosciences such as earth critical zones, urban subspace utilization, and clean energy. A proposal on “the most recent orogenic activities of the two Young Orogens-Alpine-Himalayan Orogenic Belt (Tethys) and Circum-Pacific Belt” was presented by President Cheng at several international and regional scientific meetings. In his opinion, a comprehensive study covering the entire Tethys, especially the Himalayas should be of interest to geoscientists, especially those in over 60 nations along the region who can identify the earth science issues their nations are facing in societal development. The leaders of ministries and geological surveys communicated with President Cheng at China Mining Forum and China – ASEAN Mining Forum including Malaysia, Thailand, Vietnam, Philippines, Indonesia, Singapore, Brunei, Laos, Myanmar, Cambodia, Argentina, Canada, India, Mexico, Morocco, Nigeria, Peru, Niger, Mongolia, Iran and Sudan showed their interests. Further efforts are needed to materialize these proposals.

To conclude this report, I would like to thank everyone for their suggestions and for the support from all IUGS constituent groups and those individuals during the past year. I would also like to give my sincere gratitude to the EC for efficient communication and collaboration. I must thank the Secretariat staff for their cooperation. As the President, while I am always pleased to write congratulatory messages celebrating the achievements and progresses made in science, I also feel very sad when sending condolences for losing our great geoscientists.

I wish you all the best. Looking forward to working with everyone in 2018 and beyond!

## **Prof. Dr. Stanley C. FINNEY**



## **SECRETARY GENERAL (2016-2020)**

The Secretary General led the organization and developed the agendas for the 71st IUGS Executive Meeting in Paris in February 2017, an IUGS Bureau Meeting in Long Beach, California in July 2017, and an IUGS Bureau Meeting at the Annual Meeting of the Geological Society of America in October 2017, where the IUGS President and Secretary General gave presentations to meetings of the GSA Council and the Joint GSA-AGI affiliated organizations. In addition to normal business matters (e.g., budget allocations to constituent groups and affiliated organizations), outcomes and decisions of these meetings included: 1. Approval of a new Publications Committee with Brian Marker as chair and with terms of members ending in 2018. 2. Appointment of Secretary General Stan Finney as the IUGS EC representative to the Publications Committee. 3. Oversight of the transfer of Episodes from India to Korea. 3. Appointment of Past President Roland Oberhansli as IUGS EC representative to the UNESCO Global Geopark program. 4. Appointment of Ad-hoc Review committees to review the Commission on Stratigraphy and the Commission on Tectonics and Structural Geology. 5. Appointment of Chris King, Chair of the Commission on Geoscience Education, as the IUGS representative to the ICSU funded project “Trans-disciplinary Research Oriented Pedagogy for Improving Climate Studies and Understanding” of the International Union of Biological Sciences. 6. Approval of Officers of IUGS Commissions,

Task Groups, Initiatives, and Joint Programs for 2016-2020. 7. Appointment of Vice President Kristine Asch as IUGS EC representative to the International Lithosphere Program. 8. Appointment of William Cavazza as IUGS EC representative to Finance Committee with the task of recruiting and submitting to the EC a slate of candidates for the committee. 9. Agreed that the 2018 IUGS EC meeting will be held in Potsdam, Germany. 10. Appointment of Giuseppe Di Capua as webmaster following upon many years of dedicated service by Peter Bobrowsky. 11. Agreement to redesign the template of annual reports in order to encourage opinions from Adhering Members on matters of concern to IUGS. In addition, planning began for the 72nd IUGS Executive Committee Meeting to be held in Potsdam, Germany in late January 2018.

In November 2017, the Secretary General traveled to India with the rest of the IUGS Bureau to meet with the Local Organizing Committee of the 36th International Geological Congress. President Qiuming Cheng, Treasurer Hiroshi Katazato, and I were warmly welcomed to New Delhi. We inspected the site of the Congress, were introduced to all members of the very large organizing committee, and were received by the Secretary of the Ministry of Mines, the Secretary of the Ministry of Earth Sciences, and the President of the Indian National Science Academy. We were impressed with the progress that has been made in orga-

nizing the Congress and with the enthusiasm of the many members of the organizing committee.

The Secretary General represented the IUGS Executive Committee at a meeting of the IUGS Publications Committee in March 2017 and together with the IUGS President, the Secretary General represented IUGS at IGCP meeting in Paris in February 2017. And, the Secretary General attended the dedication ceremony for the GSSP for the Chattian Stage (Oligocene) in Italy in May 2017.

The Secretary General completed numerous items on List of Actions arising from EC and Bureau Meetings. The Secretary General organized votes 1) for ratification of officers of IUGS constituent groups 2016-2020 by the IUGS EC and by the IUGS-IGC Council, 2) for ratification of six Global Heritage Stone Resource (GHSR) Proposals from the IUGS Commission on Geoheritage (Subcommission on Heritage Stone Resources); and 3) for approval by the IUGS EC of members of Ad-hoc Review Committees for TecTask and ICS. Before the vote on the Global Heritage Stone Resource Proposals the Secretary General advised the Secretary General of the Subcommission on Heritage Stone Resources on refining the protocol for developing, approving, and ratifying GHSR proposals, and for determining the documentation to be submitted with each proposal. The Secretary General prepared the 2016 IUGS Annual Report. The Secretary General gathered photos and citations of 2016 IUGS Award Recipients and arranged for their publication in the E-Bulletin. The Secretary General secured biographies and photos of the officers of the

President, Secretary General, and Treasurer for publication in the September 2017 issue of Episodes. The biographies and photos of the two Vice Presidents have also been secured and submitted to Episodes for publication the March 2018 issue.

A major effort of the Secretary General was compilation by country of leaders and voting members of all IUGS constituent groups, including IGCP projects. These compilations have been provided to leaders of national committees to IUGS for all countries at subscription level 4 and above, and they will be sent to all other member countries. The purpose is to demonstrate to the national committee of each adhering member the residents who are leaders and voting members of IUGS constituent groups and thus the residents whose participation is supported by the IUGS subscription fee paid by each country

The extensive correspondence maintained by the Secretary General included organizations interested in affiliation with IUGS and a letter of Support for recognition by UNESCO of 2021 as the International Year of Caves and Karst, as requested by from George Veni, Executive Director, National Cave and Karst Research Institute

**Prof. Dr. Hiroshi  
KITAZATO**



**TREASURER  
(2016-2020)**

**General Financial Situation of IUGS**

During the period from 01/01/2017 to 31/12/2017, IUGS was in a healthy financial position. The revenue and expenditure were USD 494,755.49 and USD 401,008.60 respectively, thus contributing a net income of USD 93,746.89. The IUGS has revived and been stable financially after the negative net income in 2014. This is a consequence of the receipt of more dues combined with cuts in unnecessary expenditure.

The table below reflects more detailed information of the financial situation during the recent four years.

	(USD)		
	revenue	expenditure	net income
2017	494,755.49	401,008.60	93,746.89
2016	597,039.88	499,247.90	97,791.98
2015	519,655.44	424,780.01	94,875.43
2014	416,140.38	433,809.48	-17,669.10

**Description of income**

In comparison with the previous year, total revenue decreased by USD 102,284.39. Membership receipts decreased USD 19,063.98 because several countries did not pay membership fees for 2017, in particular countries from the near-east to middle-east. It is noteworthy that several countries, like Sri Lanka and Mongolia changed their status from “Inactive” to “Active” IUGS members.

The table below reflects detailed information of the income situation in 2016 and 2017.

Income		(USD)	
		2017	2016
<b>Membership Fees</b>		<b>400,640.69</b>	<b>419,704.67</b>
	Previous years	29,601.78	58,973.95
	Current year	371,038.91	360,730.72
<b>Contribution from UNESCO</b>		<b>46,868.16</b>	<b>56,929.00</b>
	Final payment for last year	5,000.00	6,967.00
	1st payment for current year	33,930.75	49,962.00
	2nd payment for current year	7,937.41	
<b>Other Income</b>		<b>47,246.64</b>	<b>120,406.21</b>
<b>Total Income</b>		<b>494,755.49</b>	<b>597,039.88</b>

#### Status of Countries by Fees Category - 2017

Category	Active	Inactive	Total	Number of Countries paid for	
				2017	2016
1	24	44	68	11	4
2	14	3	17	10	3
3	14	2	16	11	1
4	6	2	8	6	-
5	-	-	-	-	-
6	2	-	2	2	-
7	4	-	4	3	1
8	5	-	5	5	-
<b>Total</b>	<b>69</b>	<b>51</b>	<b>120</b>	<b>48</b>	<b>9</b>

#### Description of Expenditure

Almost all projects in the allocation table have been paid except IGCP 657.

The table below reflects more detailed information of expenditure situation in 2016 and 2017.

Expenditure	(USD)	
	2017	2016
IGCP	102,000.00	119,000.00
Joint Programmes	20,340.00	20,310.00
IUGS Commissions	77,000.00	64,000.00
IUGS Task Groups	13,500.00	17,000.00
Initiatives	33,000.00	35,000.00
Committees	5,768.42	14,603.15
Affiliated Organizations	34,000.00	34,500.00
Contributions	13,557.50	12,147.65
Episodes	28,314.00	30,000.00
Contingency	0.00	6,300.00
Secretariat expenses	15,000.00	8,430.00
Russian Reserve expense	6,885.13	1,670.00
IGC Special expense	0.00	86,744.20
Other expenses	51,643.55	49,542.90
<b>Total Expenditure</b>	<b>401,008.60</b>	<b>499,247.90</b>

**Prof. Dr. HE Qingcheng,  
Director of the IUGS Secretariat**



**PERMANENT  
SECRETARIAT**

The IUGS Secretariat is hosted within the premises of the Chinese Academy of Geological Sciences (CAGS) under the China Geological Survey, the Ministry of Natural Resources of China. Since the relocation of the Secretariat to Beijing in December 2012, the Chinese government has been providing tremendous and stable financial and logistical support for the smooth operation of the Secretariat.

Under the guidance of the IUGS Bureau and Executive Committee, the Secretariat has maintained professional and efficient operation in line with its duties, and played an active role of communication and coordination in the scientific activities and daily administration of IUGS.

In 2017, the Secretariat assisted in the organization of several regular administrative meetings, including the 71st EC Meeting (Paris, France on February 15-18, 2017) and three Bureau Meetings (Paris, France on February 14, 2017; Long Beach, United States on June 6-7, 2017; Seattle, United States on October 23-25, 2017).

In order to increase the visibility and influence of IUGS in the international geoscience community, the Secretariat arranged and manned IUGS booth exhibitions at several major international events, including China Mining 2017 in Tianjin

China (Sept. 23-25, 2017), GSA 2017 Annual Meeting in Seattle, United States (Oct. 23-25, 2017) and AGU 2017 Fall Meeting in New Orleans, United States (Dec. 11-15, 2017). At the above events, the Secretariat staff displayed and distributed the IUGS flyers, brochures and other promotional items.

Major work of the Secretariat in 2017 also includes: updating the Contact Database and strengthening links with IUGS bodies; improving the IUGS Information Management System; designing, printing and dispatching the hard-copies of the 2016 IUGS Annual Report; assisting in membership maintenance; distributing E-Bulletins monthly to over 17,000 persons; producing and distributing New Year's E-Cards for Bureau Members and the Secretariat; designing and producing several IUGS promotional items, including pens, notebooks, U-disks and bags.

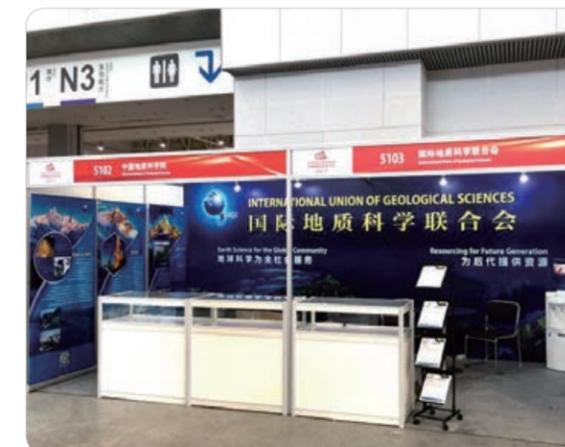
Under the leadership of the Secretariat Director Dr. He Qingcheng, all the Secretariat staff members will continue full devotion to the Secretariat duties with concerted efforts to actively support the work of the IUGS Bureau and Executive Committee and the broad-ranging scientific activities of IUGS.



IUGS-CGMW Booth at the 2017 AGU Fall Meeting in New Orleans, USA



IUGS booth at the 2017 GSA Annual Meeting



IUGS booth at the China Mining 2017 in Tianjin, China

## 2017 HIGHLIGHTS

### FEBRUARY 2017

The IUGS Executive Committee (EC) held its 71st Meeting on February 15th-17th, 2017 in UNESCO Fontenoy Building & Maison de la Géologie SGF-BRGM-CCGM, Paris, France. The meeting was sponsored by French National Committee for IUGS, Division of Ecological & Earth Sciences, UNESCO and CCGM-CGMW. This was the first EC meeting held since the election of the new IUGS EC at the IUGS-IGC Council Meeting held during the 35th International Geological Congress (IGC). Cheng Qiuming (CQ), IUGS President, sincerely thanked the UNESCO colleagues and the French IUGS National Committee for their great support for the convening of the 71st IUGS EC Meeting at the UNESCO headquarters in Paris and recalled the friendly and fruitful cooperation between IUGS and UNESCO in the field of geosciences and called for closer cooperation ties in the future.

Patrick McKeever, Chief of Earth Sciences and Geohazard Risk Reduction at UNESCO and IGCP Executive Secretary, briefly recalled the history of the International Geological Correla-

tion Programme (IGCP) and the important role it played in facilitating international collaboration among geoscientists across the globe since its initiation in the 1970s. He concluded that the earth sciences team at UNESCO would like to enhance cooperation with IUGS in the future and stood ready to render help if needed. Sylvain Charbonnier, President of the French Geological Society and Chairman of the French National Committee for IUGS, welcomed all the participants in the 71st IUGS EC Meeting and briefly introduced the history and scientific activities of the French Geological Society.

The first meeting of the new IGGP council was held at the UNESCO headquarter in Paris on Feb 22. President Cheng attended the meeting and met the new council members of IGGP and UNESCO staff members. Professor Guy Narbonne from Queen's University in Canada was elected as the chair of the IGGP council. At the IGGP open session, there were various suggestions from the participants regarding improvement of the Geopark and IGCP program.

### MARCH 2017

The publication of Episodes has moved from India to Korea. The new editor is Professor Daeyko Cheong (dkcheong@kangwon.ac.kr) and managing editor is Dr Bokyun Ko (episodes.me@gmail.com). All new submissions of papers and enquiries about papers already submitted but not yet published should go to Dr Bokyun copied to Professor Daeyko.

On 16th March the Open Geospatial Consortium (OGC) Technical Committee officially approved GeoSciML as a data transfer standard. This recognition comes as a culmination of work done by the GeoSciML working group members over the past 14 years under the auspices of the IUGS Commission for the Management and Application of Geoscience Information (CGI).

GeoSciML is an XML-based data transfer standard for the exchange of digital geoscientific information for the representation of features found on geological maps and other geoscience data such as drilling, sampling, and analytical data.

The GeoSciML technical working group aims to promote the exchange and use of geoscience by providing a single, open source, globally agreed data structure used to deliver digital geological data over the internet.

### APRIL 2017

A new INHIGEO website is online which facilitates easy communication to the public at [www.inhigeo.com](http://www.inhigeo.com).

In the framework of the UN Technology Facilitation Mechanism and the upcoming Science, Technology and Innovation Forum, the UN has initiated an online discussion open from 17 April to 5 May 2017 to mobilize all stakeholders to share information on trends in the deployment of science, technology and innovation for the

Sustainable Development Goals, specific solutions and achievements, state of the art expertise on specific issues and practice areas, emerging priorities, critical knowledge and innovation gaps, as well as their views on ways of mobilizing science, technology and innovation responses to address these gaps. The discussion will feed directly into the 2017 STI Forum.

President Qiuming Cheng, Treasurer Kitazato Hiroshi and Vice President Kristine Asch participated in the EGU 2017 in Vienna April 26-29, 2017. During the meeting President Qiuming Cheng, Treasurer Kitazato Hiroshi and Vice President Kristine Asc met Mr. Franz Kuglitsch, director of the IUGG Secretariat Office at the EGU in Vienna to discuss a future joint IUGS/IUGG event on the Ocean Realm.

Qiuming Cheng invites Nonlinear Processes in Geoscience Group (NPG) of EGU and AGU to participate with IUGS activities. He welcomes them to consider collaboration with IUGS on initiative on NPG.

Professor Judy McKenzie expressed her interest to use the fund granted by IUGS as IUGS award at the 35IGC to set up awards for the Woman Scientists in International Association of Sedimentologists (IAS). It is a good opportunity for IUGS to collaborate on a joint award for promoting IUGS in that area. There is no further financial commitment from IUGS at this point.

President Qiuming Cheng was invited to participate in the Chinese YES Congress held on April 14-15, 2017 in Xian, China and the Forum for 21th Century Strategic Plan for Tectonics sponsored by the National Natural Science Foundation (April 17-18, Xian, China).

### MAY 2017

IGCP Projects jointly funded by IUGS and UNESCO are approved for 2017 focusing on the



71st IUGS Executive Committee Meeting at UNESCO Headquarter in Paris, France

following five major themes:

1. Earth resources; sustaining our society
2. Global change and the evolution of life: evidence from the geological record
3. Geohazards: mitigating the risks
4. Hydrogeology: science of the water cycle
5. Geodynamics: control our environment

On 13 May 2017, the GSSP (Global Stratotype Section and Point) for the base of the Chattian Stage of the Paleocene Series (Paleogene System) was dedicated. The base of the Chattian Stage is defined at meter level 197 in the Monte Cagnero section, which belongs to the pelagic succession of the Umbria–Marche basin (Urbania, central Italy: 43°38'47.81"N – 12°28'03.83"E). This level with an astronomical age of 27.82 Ma coincides with the highest common occurrence of the planktonic foraminifer *Chiloguembelina cubensis* at the base of planktonic foraminiferal O5 Zone and falls in the upper part of calcareous nannofossil NP24 Zone, in the lower part of dinocyst Dbi Zone, and in the lower Chron C9n. Photos of the dedication ceremony and full description of the GSSP can be found at <http://www.paleogene.org> the website for the International Subcommittee on Paleogene Stratigraphy (International Commission on Stratigraphy, IUGS).



#### JUNE 2017

The second Bureau meeting was held on June 6-8, 2017 at the Department of Sciences & Mathematics, California State University at Long Beach, CA.

The June 2017 thematic issue of *Episodes* is dedicated to Forensic Geology. IUGS set up the Initiative on Forensic Geology (IFG) in 2006 to promote and develop forensic geology around the world.

The Geological Society of London is pleased to announce that the Lyell Collection, the Society's online publication platform hosted by HighWire Press, was upgraded on 21 June.

#### AUGUST 2017

The 8th China-ASEAN Mining Cooperation Forum and Exhibition was held in Nanning, Guangxi Zhuang Autonomous Region of China on August 23-26, 2017. President Cheng met and exchanged ideas with Dr. Weixing Cao, the Deputy Minister of Ministry of Land and Resources of China. Dr. Cao expressed that China continues to support IUGS and hopes to strengthen closer collaborations between the Ministry of Land and Resources of China and IUGS. During the Forum, Qiuming was invited to deliver a speech at the Roundtable Conference of mining officials and geological survey authori-

ties from ASEAN countries and leaders of other major international organizations on August 24, 2017. Qiuming connected with the leaders from eight ASEAN countries at the Roundtable Conference and sent e-mails to them encouraging their nations to join IUGS or promote their existing IUGS membership status. They are all invited to attend the RFG2018.

#### SEPTEMBER, 2017

The H2020 INTRAW project has been set up to map and develop new cooperation opportunities, related to raw materials, with technologically advanced non-EU countries addressing 1) research and innovation; 2) raw materials policies and strategies; 3) joint educational and skills programmes; 4) licensing and permitting procedures, royalties and tax policies; 5) data reporting systems; 6) exploration, extraction, processing and recycling practices; and 7) management and substitution of Critical Raw Materials. The outcome of the mapping and knowledge transfer activities that has been conducted during the project will be used as a baseline to set and launch the International Observatory for Raw Materials as a definitive raw materials intelligence infrastructure.

IAPG - International Association for Promoting Geoethics has established a Task Group on Responsible Mining (TGRM). IAPG organizes the Theme n. 12: "Geoethics in Engineering Geology and georisk reduction" at the 11th Asian Regional Conference (ARC-11) of IAEG – International Association for Engineering Geology and the Environment. IAPG has signed new agreements for cooperation with: International Association of Hydrogeologists (IAH), IUGS Initiative on Forensic Geology (IFG), Geology for Global Development (GfGD).

Dr. William Cavazza, VP of IUGS has participated in a meeting regarding the ICSU and ISSU merger on behalf of IUGS held on 1 September 2017 in Potsdam for GeoUnion-which was focused on the development of collective statements regarding the merger of ICSU and ISSU.

The 17th Annual China Mining Congress and Expo was held at the Tianjin Meijiang Convention Centre in China from 23-25 September 2017. President Cheng was invited to attend and deliver a presentation at the Forum for Directors General of Geological Surveys on September 24. The forum was attended by director generals and ministers of Ministry of Mines of several countries including Argentina, Canada, Mexico, Morocco, Nigeria, Peru, Niger, Mongolia, Iran and Sudan. Qiuming has communicated with these participants and sent emails to invite them to join IUGS or promote their existing IUGS membership status. They were all invited to attend the RFG2018. A booth was set at the Congress which attracted many visitors. Thanks go to the Secretariat Office for preparing the excellent materials and taking care of the booth during the event.

Roland Oberhänsli, Past President of IUGS, attended, and reports on, a European Geopark Network (EGN) meeting on the Azores Island of San Miguel (September 5th -9th, 2017) and the UNESCO Global Geopark Council (UGGpC) meeting in Zhijin, China (September 16th – 17th). The UNESCO meeting considered 15 nominations for Geopark status and 38 reevaluations. The outcome will be announced after UNESCO Council ratification. Guidelines for geological field evaluation of proposals were also discussed.

## OCTOBER 2017

The first 7 papers of the new IAPG special volume on geoethics in *Annals of Geophysics* have been published online and are now available for free download. The special volume is entitled "Geoethics at the heart of all geoscience" and is edited by Silvia Peppoloni, Giuseppe Di Capua, Peter T. Bobrowsky and Vincent S. Cronin. IAPG has become a member organization of the ICPHS - International Council for Philosophy and Human Sciences.

The responsibility for the IUGS website has recently passed from Peter Bobrowsky of the Natural Resources Canada to Giuseppe di Capua who is a research geologist at the Istituto Nazionale Geofisica e Vulcanologia, Italy. The IUGS thanks Peter sincerely for his decade of dedicated work as webmaster. Giuseppe is already updating the site with new material as it arrives and is considering potential improvements to the site.

IUGS joined some 230 representatives of ICSU's global membership in Taipei, Taiwan, China for the triannual 32nd General Assembly. The Union participated actively in the process of merging ICSU (International Council for Science) and ISSC (International Social Science Council) in the new International Science Council which will include 40 international scientific unions and associations, and more than 140 national and regional organizations such as academies and research councils. The ICSU GeoUnions, an interdisciplinary consortium of nine ICSU international scientific unions (IAU, ICA, IGU, INQUA, ISPRS, IUGG, IUGS, IUSS, URSI), drafted a common statement in favor of the merger. The document – which was read during the General Assembly –

underscores that the merger provides possibilities for strengthening the cooperation between the scientific unions/associations, national members and interdisciplinary bodies.

The third Bureau meeting was held at GSA in Seattle, USA October 24-25. In addition to the Bureau members (Qiuming, Stan and Hiroshi), other participants included: Kristine Asch, Vice President, Edmund Nickless, Councilor, Ester Szein, Permanent Contact of the U.S. National Committee for IUGS, Peter Bobrowsky, IUGS webmaster. During the meeting, the participants of the Bureau Meeting had a good opportunity to communicate with GSA councilors as well as the U.S. National Committee for IUGS. At the same time, a booth of IUGS was set up during the GSA Annual Meeting 2017.

The Sixth Chinese National Conference on Sedimentology in Nanjing, October 28-29, 2017. At the conference, President Cheng had a chance to meet with professor Jun Chen, the President of the Nanjing University. President Chen expressed his willingness to support IUGS. Chen introduced the comprehensive programs in Earth sciences and offered suggestions in the collaboration of basic science, resources, hazards as well as humanities and other aspects of Earth sciences with IUGS. At the conferences, Qiuming exchanged with prof. Maria Mutti, president of Society for Sedimentary Geology (SEPM), Prof. Adrian Immenhauser, President of International Association of Sedimentologists (IAS) and leaders of other organizations. One suggestion was for IUGS to consider open membership for affiliated organizations to select pay members of international associations with vote privilege. So, an item is included on the agenda of the EC for discussion.

The CCOP and IUGS Task Group on Geohazards (TGG) organized a seminar on the 18th October, 2017 in conjunction with the 53rd CCOP Annual Session held in Cebu City, Philippines. Seven papers from Japan, Korea, the Philippines and Thailand were presented. Approx. 40 people from the CCOP member and cooperating countries and organizations attended to discuss geohazard research and disaster risk reduction.

## NOVEMBER 2017

The IUGS Bureau has approved a consolidated statement of policy and ethics for publications, particularly the journal *Episodes*. The statement provides, for the first time, clarity of what is expected in terms of the quality and integrity of IUGS publications. It should be read by all contributors.

The IGCC meeting was held in New Delhi, India. The Bureau members (Qiuming Cheng, Stan Finney and Hiroshi Kitazato) visited the India Expo Mart Limited, the venue for the 36th IGC and had exchanges with the LOC and with Dr. Shri Arun Kumar, Secretary, Ministry of Mines; Dr. M Rajeevan, Secretary, Ministry of Earth Sciences, senior officers of the two Ministries, and Dr. V P Dimri, President and Dr. P R Golani the Secretary of 36th IGC. Both sides had fruitful discussions about 36th IGC and also encouraging the possibility for other collaboration between IUGS and India.

## DECEMBER 2017

ENCYCLOPEDIA OF MARINE GEOSCIENCES wins the 2017 Mary B. Ansari Best Geoscience Research Resource Award of the Geoscience Information Society (GSIS) Four geologists - Jan Harff (University of Szczecin, Poland), Martin Meschede (University of Greifswald,

Germany), Sven Petersen (GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany) and Jörn Thiede (Saint Petersburg State University, Russia) jointly edited the *Encyclopedia of Marine Geosciences* that was published by Springer-Nature in 2016 (Harff et al. 2016). In the book 182 authors give a comprehensive overview of the marine geosciences in terms of theoretical background, methodologies and applied aspects and describe, in 195 entries, the state-of-the-art of this field of science.

Qiuming Cheng, President of IUGS, had a meeting with the administration of the R&D center of the geological survey of China on Dec. 8, 2017. The main purpose of this meeting was to explore the possibility of collaborating with China Geological Survey on setting up a Center of Excellence on "Global Scale Resource and Environment Big Data and Discovery". The term refers to a network of institutions collaborating with each other to pursue excellence in Geological Big Data Mining and Resources and Environmental Assessments.

IUGS set up a booth at the AGU Fall Meeting 2017.

CGI GeosciML Working Group Chair Ollie Raymond received a 2017 achievement award from Geoscience Australia in December 2017 for his leadership in the production of the GeoSciML data standard over the last 10 years. The GeoSciML v4.1 data standard was ratified and published by Open Geospatial Consortium (OGC) in March 2017, shortly after the acceptance of GeoSciML version 4.0 data transfer standard by a unanimous vote of the Technical Committee of OGC.

## IUGS BODIES THE REAL LIFE OF THE UNION

The International Union of Geological Sciences promotes and encourages the study of geological problems, especially those of world-wide significance throughout the activities of IUGS Commissions, Task Groups and Initiatives.

At present IUGS gives special consideration to:

- International standards;
- Geoscience education;
- Geoscience information;
- Environmental management.

IUGS believes that it is of mutual benefit to establish close links with other organizations engaged in geosciences activities and especially those organizations whose work relates to some of the major activities of IUGS.

The list of currently active IUGS bodies testifies to these major aims of the Union. Links allowing description of the organization and activities of the IUGS bodies are provided on the IUGS website ([www.iugs.org](http://www.iugs.org)):

### Scientific Commissions

Commission on Geoscience Education, Training & Technology Transfer (COGE)

International Commission on Stratigraphy (ICS)  
International Commission on History of Geological Sciences (INHIGEO)  
Commission for the Management and Application of Geoscience Information (CGI)  
Commission on Tectonics and Structural Geology (TECTASK)  
International Commission on GeoHeritage (ICG)  
Commission on Global Geochemical Baselines (GGB)

### Joint Programs

International Geoscience Programme (IGCP)  
International Geological Congress (IGC)  
International Lithosphere Program (ILP)

### Task Group

Task Group on Global Geoscience Professionalism (TGGGP)  
Task Group on Geohazards (TGG)  
Task Group on Isotope Geology and Geochronology (TGIG)

### Initiatives

Resourcing Future Generations (RFG)  
Initiative on Forensic Geology (IFG)

## Edmund NICKLESS Chair of NASIC



The New Activities Strategic Implementation Committee (NASIC) was established in 2013 following the 66th IUGS Executive Committee to implement the Resourcing Future Generations (RFG) initiative.

Global economic and social development relies upon the discovery and extraction of mineral, energy and water resources and the rationale in establishing RFG is to consider:

How can demand for these resources be met with continued population growth and the right of all peoples to improved living standards?

How do we secure resources for future generations in ways that are economically, environmentally and socially responsible?

The prime objective of RFG is to help ensure the multigenerational needs for raw materials, energy and water while ensuring social equity. To do that requires four fundamental actions by the global geoscience community:

Comprehensive evaluation and quantification of 21st century supply and demand;

Enhanced understanding of the subsurface as it relates to resource deposits;

Assessment of where new resources are likely to be found;

Building the needed and advanced skills capacity, particularly in lesser developed nations, to discover and responsibly develop mineral resources.

## IUGS INITIATIVES - APPLYING GEOSCIENCE TO SOCIETAL NEEDS

While seeking to:

Secure supply of raw materials 20 years from now, beyond the span of present predictions;

Develop a multidisciplinary approach across the broad range of geoscience disciplines, bridging academia, industry and national geological surveys sector, and working with the social sciences;

and including original research, drawing together available data and providing modern, innovative interpretations and including outreach and educational activities.

The ubiquitous use of metal and mineral resources in technology and infrastructure have underpinned the dramatic improvements of living standards for many over the past 50 years. Demand has increased dramatically and the range of materials used has broadened to the extent that some metals are regarded as critical to sustain certain technologies (Figure 1). It has been estimated that to continue to improve the lot of the world's poorest by eradicating poverty and disease by 2030 as envisaged by the UN Sustainable Development Goals (Figure 2), while simultaneously reducing the level of atmospheric carbon dioxide as envisaged by the Paris Agreement (FCCC/CP/2015/L.9/Rev.1, <http://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>) will double or triple the demand for metals and minerals by 2040, illustrating the prescience of IUGS in establishing RFG as a contribution by the geoscience community to the resolution of this societal challenge.

### Critical Mineral Commodities through Western Civilization



Figure 1: Critical mineral commodities through western civilisation (after Roland Oberhänsli, 2013, personal communication).

### SUSTAINABLE DEVELOPMENT GOALS



Figure 2: United National Sustainable Development Goals. UN (2015) Transforming our world: the 2030 Agenda for Sustainable Development A/RES/70/1

Since RFG was established progress has been made in raising awareness among some external publics; linking to IUGG and other geo-unions; attracting financial support from ICSU and UNESCO; reaching out to the social sciences and engineers; making links to the UNEP International Resources Panel and various Horizon 2020 projects; and by seeking to open a dialogue with policy makers in Germany and the UK.

Specific activities to advance the RFG initiative during 2017 have included:

Issuing a Second Open Call for small grant proposals. The outcome is at Table 1 together with details of awards made under the First Open Call. The average award made is about \$3k.

Participating in an EFG/UNFC workshop: International cooperation on natural resources (Brussels, 9/10 February 2017) and other events as listed at Table 2.

As a precursor to RFG2018 and to launch the Geological Society of London's Year of Resources, convening the second in a series of two-day Bryan Lovell meetings.

Submitting four proposals as detailed at for sessions at RFG2018, all of which have been accepted.

Submitting a proposal to the Bellona Foundation to support a workshop entitled 'Russian extractive sector and global resource governance' to be held in Oslo or St Petersburg, early in April 2018.

The coming year will focus on:

Developing programmes for each of the successful bids for RFG-related sessions at RFG2018 with the aim of attracting a broad range of disciplines spanning geoscience and social science, but also those involved in policy advice and decision making, and to attract the widest possible range of discipline interests as well as large audiences including future leaders.

Issuing a Third Open Call with the intent of broadening participation in RFG by widening its scope to include energy and water as well as industrial minerals such as sand and gravel, dimension stone, clays and cement, the so-called Development Minerals.

Table 1: Grants awarded under the First and Second Open Calls.

First Open Call			
Qiuming Cheng & others	China University Beijing & York University, Canada	Quantitative assessment and prediction of deeply buried mineral resources in covered regions	\$2000
Kedia Chi & others	University of Buea, Cameroon	Capacity building for stakeholders in artisanal gold mines, Eastern Cameroon	\$3700
Judith Kinnaird & others	University of Witwatersrand, South Africa	Germanium for society - now and in the future	\$3400
Gavin Mudd & Simon Jowitt	Monash University, Melbourne, Australia	Validating new methods for global resource estimates of critical metals	\$3000
Andrea Rielli	Monash University, Melbourne, Australia	Metasomatic alteration of the sub-arc mantle: implications for are metallogeny and the redox state of the Earth	\$3100

Isobel Yeo	GEOMAR, Kiel, Germany	Acoustic properties of ferromanganese crusts and substates as a tool for e-tech exploitation	\$3100
<b>Second Open Call</b>			
Nicholas Arndt	Grenoble Alpes, France	Public perception of the minerals industry	\$3000
Maria Amelai Enriquez	University of Para, Brazil	Mining royalties - challenges and opportunities to achieve Sustainable Development Goals and intergenerational equity in the peripheral mining regions	\$3000
Damiaen Giurco	Institute for Sustainable Futures, University of Technology, Sydney, Australia	Global projection of lead-zinc supply from known resources	\$2750
Raymond Kudzawu-D'Pherdd	Accra mining Network, Ghana	AMN capacity building master class in sustainable and responsible small scale mining	\$4400
Laura Sinclair	Cornell University, USA	Mineralogical examination of leached tails for the development of copper in situ leaching	\$3130
Margreth Tadie	Stellenbosch University, South Africa	Impacts of cation-substitution on the metallurgy of sulphide minerals	\$4021

The First Open Call attracted 11 applications seeking \$63.6k of which six totalling \$18.3k were funded: under the Second Call 21 proposals seeking \$74.9k were received of which six totalling \$20.25k were funded and another two or three highly regarded bids might have been had funds been available. In comparison to the first round when three applications came from Africa, four from Australia, three from Europe and one from North America, the Second Call had wider geographical coverage with four applications from South-east Asia, eight from Africa, four from Europe, one from South America and one from North America.

Table 2: Meetings attended during 2017

9/10 February 2017	International co-operation on natural resources: geoscientists' contribution to enhanced governance, policy making and attainment of the Sustainable Development Goals. UN Economic Commission for Europe & European Federation of Geologists. Brussels.
27 March 2017	Ethics in small-scale mining. Horizon 2012 IMP@CT stakeholder meeting, London.
25/28 April 2017	Beyond classification – managing resources sustainably. Expert Group on Resource Classification, Eighth Session including UN Framework Convention Workshop. UN Economic Commission for Europe. Resource Classification Week 2017. UNECE, Geneva.
19/20 June 2017	European and global extractive industries: Steps towards sustainable partnership approaches and responsible mining practice. Horizon 2020 STRADE workshop, Brussels.
22/23 June 2017	Raw materials workshop. Ministry of Foreign Affairs of the Netherlands. The Hague.
6 July 2017	Towards strategic management of mineral deposits in Europe. Horizon 2020 MINATURA scoping roundtable. Geological Society, London.
2/3 November	Strategic materials for a low carbon future: from scarcity to availability. Oxford Martin School, University of Oxford and Veolia Institute, St Catherine's College, Oxford.
23/24 November	Mining for the Future. Second Bryan Lovell meeting. Geological Society, London.

## Brian MARKER Chair of IUGS



## PUBLICATIONS COMMITTEE

The members of the IUGS Publications Committee are Brian Marker (Chair), Daekyo Cheong (Editor of Episodes), Fareeduddin Fareeduddin (past-Editor of Episodes), Giuseppe de Capua (IUGS webmaster), Dolores Pereira, Stan Finney (IUGS SG).

In 2017, the Committee prepared the first IUGS statement of policy and ethics for publications which was ratified in October.

Two books were published for IUGS by the Geological Society of London. Seven more were in preparation.

Transfer of publication of Episodes from the Geological Society of India to the Geological Society of Korea began in November 2017. Work on securing an online editorial and review management system and to introduce online-first publication of papers continued. The journal attracted a good number of submitted papers: about 57% of manuscripts were rejected, without affecting issue sizes, maintaining quality.

The Committee promoted the publication of material relating to IUGS's accountability to Membership including: reports from the Secretariat on meetings of the Executive Committee and Bureau; reports of Ad-hoc Reviews of IUGS activities; summaries of annual reports; and biographical information on IUGS officers.

Efforts to secure, in each issue of Episodes either a keynote or major state-of the science review paper by an eminent geoscientist and securing alternating thematic and general issues of Episodes began. Leaders of IGCP projects were reminded of the need to publish final reports in the journal. Steps were taken to secure more book reviews.

Guidance for Editorial Board members and Guest Editors was revised and documents for contributors and prospective editors were being finalized. Also, membership of the Editorial Board was expanded.

## EPISODES

EPISODES covers developments of regional and global importance in the Earth sciences and is distributed worldwide to scientists in more than 150 countries. Articles contributed to Episodes are of interest to a broad audience of professional scientists having diverse cultural and linguistic backgrounds. Articles include current reviews, new results from research projects of more than local significance, and discussion of the infrastructure of science including techniques, research programs, organizations, science policy, or technical assistance.

The new Editor of EPISODES, Prof. Daekyo Cheong, and Managing Editor, Dr. Bokyun Ko, have been charged with editing EPISODES since the mission moved to Korea in January, 2017.

Volume	Number	Publication date	No. of papers	Type								Page	Remarks	
				Article	Review article	Conference report	Project report <sup>(a)</sup>	Book review	Erratum	Event promotion	Profile			
40	1	2017. 3. 31.	14	10	0	3	1	0	0	0	0	0	001-094 (94)	
	2	2017. 6. 30.	10	10	0	0	0	0	0	0	0	0	095-176 (82)	Special Issue on Forensic Geology
	3	2017. 9. 30.	12	7	0	2	0	0	1	1 <sup>(b)</sup>	1	1	177-268 (92)	
	4	2017. 12. 31.	11	8	1	0	1	1	1	0	0	0	269-364 (96)	

<sup>(a)</sup> IGBP, <sup>(b)</sup> RFG2018.

Table 1

Submitted manuscripts	Manuscript type				Review status			
	Article	Project report <sup>(a)</sup>	Conference report	Book review	Accepted (published)	Rejected	Withdrawn	Under review
52	39	5	6	2	22 (12)	21	4	5

<sup>(a)</sup> IGBP.

Table 2

The total number of papers published in EPISODES in 2017 was 47 (refer to Table 1). The June issue is a special issue: Forensic Geology.

The total number of papers submitted in EPISODES in 2017 was 52 (refer to Table 2). Among these, 22 papers have been accepted for publication.

A new eISSN number for electronic publication of EPISODES was assigned as EISSN: 2586-1298 in July, 2017.

An on-line manuscript submission and review system for EPISODES, Editorial Manager, was launched on 1st of March, 2018. A pop-up window connecting the system is working at the website: <http://www.episodes.org>

Next, the on-line-first publication system will be set up at the homepage of EPISODES, <http://www.episodes.org>, in early June, 2018.



Prof. Daekyo Cheong.



Dr. Bokyun Ko



David A.T. Harper  
Chair

## INTERNATIONAL COMMISSION ON STRATIGRAPHY



Philip L. Gibbard  
Secretary General

The International Commission on Stratigraphy is the largest and longest-established of the commissions and working groups attached to the IUGS. The Commission was rigorously reviewed in September 2017, the ad hoc review committee (ARC) providing a significant number of key recommendations that have been communicated to the membership for action. The panel reported that 'Commission is in robust health, its outputs are remarkable and the voluntary contribution excellent. The enduring focus of the ICS on critical transitions in Earth history has revealed some of geology's most profound implications for present and future global society. There is an unrivalled opportunity to promote the societal significance and relevance of the work of the Commission and how that highlights Earth history.' During the current cycle we have built on this strong legacy.

Activity on Global Boundary Stratotype Sections and Points is again gathering momentum with discussions and votes on new stages and their boundaries within the Cambrian, Permian and Quaternary systems, more specifically the Permian Sakmarian Stage GSSP, the Holocene Series/Epoch divisions (three stages – Green-

landian, Northgrippian and Meghalayan and associated subseries), and the Cambrian Wuliuan Stage GSSP (former Stage 5) and the accompanying Miaolingian Series (former Series 3) are in process. It is hoped that final decisions will be reached by the Commission during June 2018 and these GSSPs will be forwarded to the IUGS for ratification later that year. Many more proposals are under development we hope to significantly advance on the 70% of GSSPs already defined.

The positive results of the International Subcommission on Stratigraphic Classification (ISSC) ballot on unit stratotypes (for chronostratigraphical units) and astrochronozones have just been received; these innovations open up exciting new prospects for more precise correlations, in line with the ARC's wish to see more non-biological tools used in our charts.

The translations of the chart continue to multiply with the addition of Brazilian Portuguese, German, French and Russian versions ([www.stratigraphy.org](http://www.stratigraphy.org)). The huge international reach of the Commission will again be demonstrated at the next STRATI (2019) meeting in the historic city of Milan in Italy, a country who many

will recognize as the home of stratigraphy. The meeting dates are the 2nd to 5th July 2019 in the historical building of the Università degli Studi di Milano, but the pre- and post-congress field trips will be organized in the Alps, Appennines and on the Italian islands. STRATI 2019 is organized by the Commissione Italiana di Stratigrafia, Servizio Geologico d'Italia, Società Geologica Italiana, Società Paleontologica

Italiana, Associazione Italiana per lo studio del Quaternario, and Università degli Studi di Milano together with the International Commission on Stratigraphy.

And finally the Ordovician is in the news again with a thematic issue of *Lethaia* (a recognized outlet for ICS related publication) devoted to the Great Ordovician Biodiversification Event.

## THE HERITAGE STONES SUBCOMMISSION

BY DOLORES PEREIRA, SECRETARY GENERAL OF SUBCOMMISSION ON HERITAGE STONES

The Heritage Stones Subcommission (HSS) was established in 2016, at the 35th International Geological Congress in Cape Town, upgrading the previous Heritage Stones Task Group (33rd IGC in Oslo, 2008) into the new International Commission on Geoheritage. The main goal of this working group is the recognition of natural stones that have been used for a long period of time in the construction of architectural heritage. These stones should be recommended for construction and restoration of those historic buildings, sometimes part of UNESCO World Heritage cities, even if the extraction quarries are not active any more. For this, the HSS has been working on the concept of Global Heritage Stone Resource (GHSR)

The year 2017 was very fruitful for HSS. GHSR was recognized by the IUGS EC as a new geological standard, established as a formal international geological designation for import-

ant types of natural stone that have been widely used and/or have widespread cultural and architectural recognition. GHSR designation is a scientific recognition with no commercial value. The protocol to achieve GHSR designation was approved by the HSS and the IUGS EC ratified the process in 2017.

The first stone achieving recognition as a GHSR is the Portland Stone. Subsequently, another seven natural stones have achieved the designation, after IUGS EC approval in 2017. At present, the designated GHSRs are

- Portland Stone from UK
- Larvikite from Norway
- Petit granit from Belgium
- Podpeč Limestone from Slovenia
- Carrara Marble, from Italy
- Hallandia Gneiss, from Sweden
- Villamayor Stone from Spain
- Estremoz Marble from Portugal

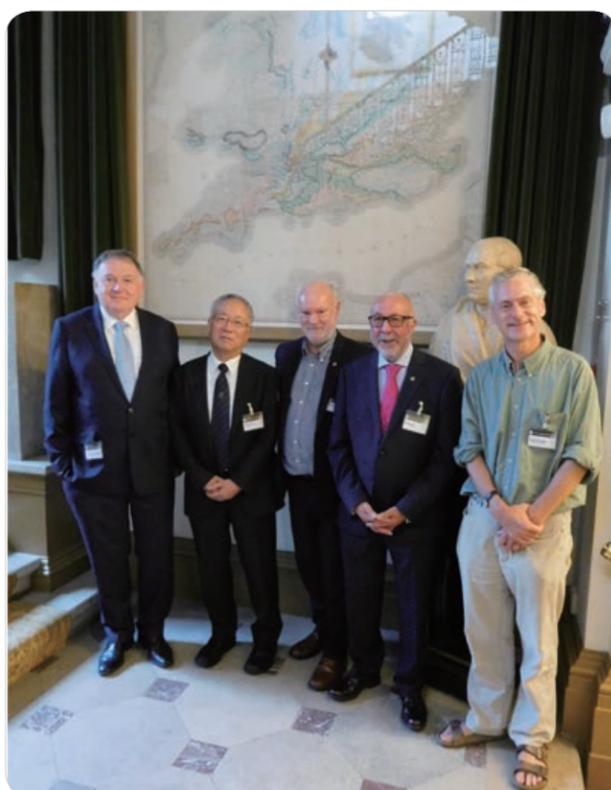


Figure 1. Meeting of the IUGS Ad Hoc Review Committee in the Geological Society, London (September 2017). From left to right Paul Smith (external assessor), Hiroshi Kitazato (Treasurer, IUGS), David Harper (Chair, ICS), Edmund Nickless (Councillor, IUGS) and Nigel Hughes (external assessor); the bust of William Smith and his iconic map, in the background.

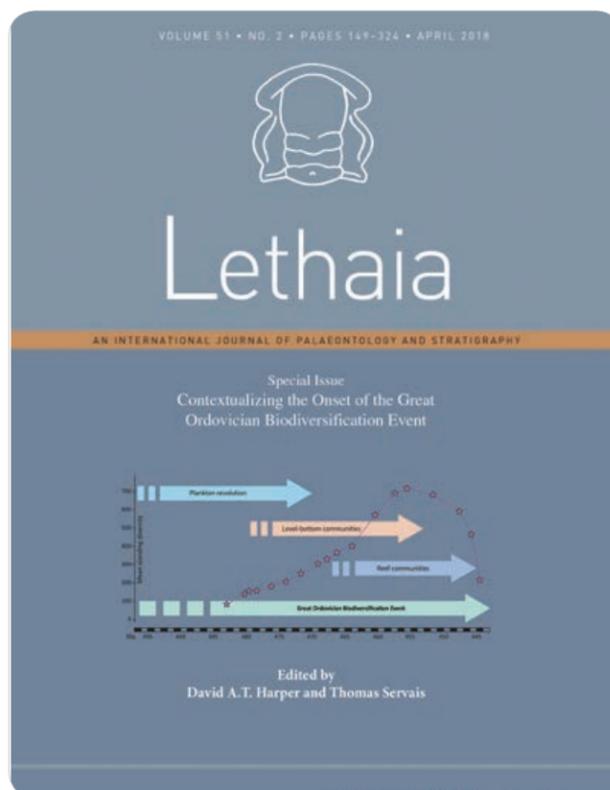


Figure 2. Front cover of current part of *Lethaia*, dedicated to the Great Ordovician Biodiversification Event (edited by David Harper and Thomas Servais).



Estremoz Marble. Picture by Lola Pereira

Nine more stones are in the process of evaluation and recognition, after presentation of the stones at HSS special session at the EGU in Vienna, 2017, and publication of articles in inter-

national journals such as Episodes, Geoheritage and the Geological Society Special Publications.



Larvikite. Picture by Tom Heldal

As a consequence of the achievements of the HSS in 2017, UNESCO-IUGS approved an extension of the IGCP-637 (Global Heritage Stone Designation) for another year, which will support much more work on the recognition of natural stones as GHSR.

Some members of the HSS are also partners of

the NATUREUROSTONES European Commitment (European Innovation Partnership on Raw Materials: Building a harmonized European database on natural stones for the use of construction and restoration), which is led by the HSS Secretary General. This Commitment was approved in 2016 and renewed for 2017.

## COLLABORATIVE JOINT PROJECTS INTERNATIONAL GEOSCIENCEPROGRAMME (IGCP)

In 2017, the International Union for Geological Sciences worked closely with UNESCO to mobilize global cooperation in the Earth sciences through the International Geoscience Programme (IGCP). IUGS's financial contribution to IGCP secured the continuity of this program, with a heritage of over 45 years, providing a platform for scientists from across the world to push the frontiers of knowledge forward through concrete scientific research projects.

In 2017, 135 project leaders from 111 countries (Figure 1) collaborated with at least 3380 project participants to deliver the objectives of 23 active IGCP projects. 46% of the participants are young scientists (<35 years old) and 47% of all participating scientists are coming from developing nations. Gender equality being UNESCO's priority area, 34% of project leaders and 29% of participants scientists are women (Figure 2).

IGCP projects published over 300 scientific papers addressing several UN Sustainable Development Goals.

In 2017, thirty-five IGCP project meetings have successfully been organised in twenty different

countries by building bridges between disciplines and between Earth scientists (Figure 3), including young ones, with aims of stimulating cutting-edge research and sharing scientific knowledge for the benefit of all.

In December 2016, under the new operating guidelines for the IGCP within the International Geoscience and Geoparks Programme, six new members of the IGCP Council were appointed jointly by the Director-General of UNESCO and the President of the IUGS. Newly established Council of the IGCP, with the participation of IUGS President and Secretary general, held their first meeting in February 2017 and evaluated the progress of 26 existing projects as well as nine new project proposals that requested new funding. Four new projects were approved by the IGCP Council (Figure 4).

The IUGS Secretariat and treasurer worked closely with UNESCO IGCP secretariat to provide regular updates about the progress of IGCP projects and their meetings to the wider Earth science community via the dedicated IGCP website (<http://www.unesco.org/igcp>) including IGCP Theme summaries and the presentations of the council members as well as the IGCP 2017 annual report.



Figure 1: World map showing IGCP projects participating countries (in dark green) in 2017.

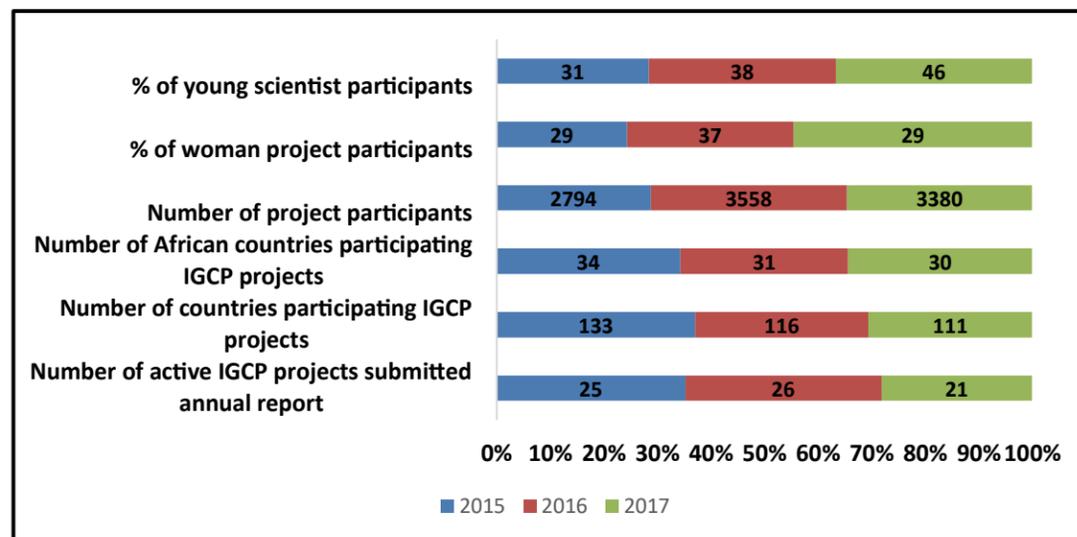


Figure 2: Comparison of IGCP projects participants between 2015 and 2017.



Figure 3: IGCP 636 Young scientist project Meeting – Los Nevados National Park (Colombia).

N°	Projects	First Project Leader	Theme	Duration
589 OET	Development of the Asian Tethyan Realm	Xiaochi Jin (China)	Geodynamic	2012-2016
608	Asia-Pacific Cretaceous Ecosystems	Hisao Ando (Japan)	Global Change	2013-2017
609	Cretaceous Sea-Level Changes	Michael Wagreich (Austria)	Global Change	2013-2017
610	From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary	Valentina Yanko-Hombach (Ukraine)	Global Change	2013-2017
618 OET	Paleoclimate information obtained from past-recharged groundwater	Dioni I. Cendon (Australia)	Hydrogeology	2012-2016
628	The Gondwana Map Project	Renata de Silva Schmidt (Brazil)	Geodynamic	2013-2017
630	Permian-Triassic Climatic and Environmental Extremes and biotic responses	Zhong Qiang (China)	Global Change	2014-2018
632	Continental Crisis of the Jurassic	Jongeng Sha (China)	Global Change	2014-2018
636-Y	Characterization and sustainable exploitation of geothermal resources	Daniela Blessant (Columbia)	Earth Resources	2016-2018
637	Heritage stone designation	Dolores Pereira (Spain)	Earth Resources	2015-2019
638	Paleoproterozoic Birimian geology for sustainable development	Moussa dabo (Senegal)	Earth Resources	2016-2020
639	Sea Level Changes from minutes to millenia	Simon Engelhart (USA)	Global Change	2016-2020
640	Significance of Modern and Ancient Submarine Slope and Landslides	Lorena Moscardelli (USA)	Geohazards	2015-2019
641	Deformation and fissuring caused by exploitation of subsurface fluids	Dora Carreon-Freyre (Mexico)	Geohazards	2015-2018
643	Water Resources in Wet Tropics of West-Central Africa	Bamory Kamagate (Côte d'Ivoire)	Hydrogeology	2015-2019
646	Dynamic interaction in tropical Africa	Kankeu Boniface (Cameroon)	Geodynamic	2015-2018
648	Supercontinent Cycles and Global Geodynamics	Zheng-Xiang Li (Australia)	Geodynamic	2015-2019
649	Diamonds and Recycled Mantle	Jingsui Yang (China)	Geodynamic	2015-2019
652 new	Reading Geologic Time	A.C. Da Silva (Belgium)	Global Change	2017-2021
653	The onset of the Great Ordovician Biodiversification Event	Thomas Servais (France)	Global Change	2016-2020
655 new	Toarcian Oceanic Anoxic Event	Matias Reolid (Spain)	Global Change	2017-2019
657 new	Information Platform on Earthquake Early Warning Systems	R. Allen (USA)	Geohazards	2017-2021
661 new	The Critical Zone in Karst Systems	Jiang Zhongcheng (China)	Hydrogeology	2017-2021

Figure 4: IGCP 2017 project list, 23 projects were active; 21 projects were funded including 4 new projects approved by the IGCP council in 2017.

## Dr Laurance DONNELLY Chair, IUGS-IFG



**INTERNATIONAL UNION OF  
GEOLOGICAL SCIENCES  
(IUGS), INITIATIVE ON FO-  
RENSIC GEOLOGY (IFG)**

In 2017, the IUGS Initiative on Forensic Geology (IFG) continued to promote and develop forensic geology throughout the world with notable events held in; Austria, Australia, Abu Dhabi, Brazil, Canada, China, England, Hungary, Italy, Japan, Netherlands, Northern Ireland, USA, Scotland, Sicily and Singapore.

Throughout 2017, IUGS-IFG focused on the advancement of forensic geology in Asia. This included the co-organisation of a workshop in Beijing, China, in association with the Institute of Forensic Science, Ministry of Public Security, Division of Trace Evidence Analysis. This event was attended by delegates from institutions across China, USA and the State Criminal Police Office in Berlin. Forensic soil cases were presented and discussed that included geological applications to homicide, fraud and a case involving stolen dinosaur eggs that were imported into Australia from China. IUGS-IFG also supported the Trace Evidence Working Group (TEWG), of the Asia Forensic Science Network (AFSN) in Singapore. Over 57 participants attended from Singapore, Thailand, South Korea, Philippines, China and Brunei. Field training was provided by IUGS-IFG at the Health Science Authority (HAS), Forensic Chemistry and Physics Laboratory. This demonstrated the forensic geological description and classification of soils in excavations. In Japan, IUGS-IFG's Officer for Asia continued to develop forensic geology with the National Research Institute of Police Science.

Approximately 300,000 people a year go 'missing' in the UK alone. The Home Office, Centre for Applied Science and Technology (CAST), established the Search Technologies Academic Research Team (START) to share knowledge, experiences and emerging technologies in Law Enforcement Front Line Search Operations. Six members of the IUGS-IFG committee were invited by CAST to take part in this project. An objective is to deliver best practice for land and water searches related to homicide, serious organised crime and counter terrorism.

Numerous technical meeting, conferences and workshop throughout 2017 included; ground searches for burials, water searches, human decomposition facilities, defence and security canine and detector dogs, forensic archaeology, geoethics, fakes and fraud, missing persons, risk management in forensic geology, taphonomy and criminalistics. IUGS-IFG delivered and co-organised the 3rd IberoAmerican Seminar on Forensic Geology, in La Plata, Argentina. Over 200 delegates attended from 10 countries. Themes included; forensic soil evidence, the judicial system and laboratory data, forensic palynology and mycology, minerals and gem fraud in Amazonia, mineral fraud and money laundering, GIS and forensic geology and the search for missing persons in Brazil, Argentina and Chile.

IUGS-IFG signed an agreement with the International Association for Promoting Geoethics

(IAPG) to develop the ethical and social aspects of forensic geology. In April 2017, preliminary discuss was held at the European Geophysical Union, in Vienna, Austria. This will be followed by a joint session at the Resourcing Future Generations Congress, in Vancouver, in June 2018.

Learning and development in forensic geology was provided by IUGS-IFG at BSc, MSc, PhD levels at several universities and for school children aged 8-18. There was regular engagement with the media resulting in broadcasts, tabloid reports, radio and TV interviews.

Members of the IUGS-IFG Committee were invited to give key presentations and recognised for their contribution to forensic science and forensic geology: Prof Lorna Dawson gave a presentation to the Royal Institution and also received the Pride of Britain Award; Dr Rosa

Maria Di Maggio (and Dr Pier Matteo Barone) were presented with the Italian Investigation and Forensic Award; Dr Jennifer McKinley received an award from the Geological Survey of Northern Ireland. Dr Laurance Donnelly was invited by the Geological Society of America to deliver a presentation on forensic geology, at the Geological Society of America Congress in Seattle, which was simultaneous broadcasted on the internet.

IUGS-IFG published an article on forensic geology in 'Geoscientist' (Magazine of the Geological Society of London) (January 2017). For the first time a themed issue of 'Episodes', was published and dedicated entire to forensic geology (June 2017).

IFG's events and activities resulted in significant, high-profile and positive, global exposure for IUGS during 2017.



IUGS-IFG Chair delivering an invited presentation on forensic geology at Geological Society of America, in Seattle, USA (September 2017).

### Selected Photographs



(Left) Special issue of 'Geoscientist', The magazine of the Geological Society of London, Forensic Geoscience Group to celebrate its 10th Anniversary. (Right) 'Episodes', special themed issue on Forensic Geology.



(Left) IUGS-IFG and the Institute of Forensic Science, Ministry of Public Security People's Public of China. (Middle) Participants of the three day 'Soil Forensics Workshop' in Singapore. (Right) Participants being shown how to describe a typical human-made soil during the one day "hands-on" Forensics Workshop in Singapore.

## CGMW - MORE THAN 100 YEARS OF INTERNATIONAL MAPPING PROJECTS

BY MANUEL PUBELLIER, PRESIDENT - CGMW

In the world of geosciences, international organizations play a particular and important role in bringing together skills and knowledge. CGMW (<https://www.cgmw.org/>), founded in 1913, is one of the oldest affiliated organizations of the IUGS. It is also affiliated to the IUGG and benefits from UNESCO's support. In contrast with IUGS, CGMW emanated originally from the national Geological Surveys, which are still the main active contributors, and to which associate members such as universities, geological societies and members from the industry have been affiliated during its long history. CGMW is responsible for promoting and coordinating the preparation and publication of small scale solid earth science maps of continents, oceans, major regions of the earth and promoting those of national territories.

In accordance with its mission, and within the large world of geosciences, CGMW is spearheading international cooperation between countries by providing a forum for discussions. It is also a platform for international projects based on mapping projects which delivers well-known international maps at the rate of 2 to 4 per year.

Beyond this, and during the various workshops, the international projects are implemented by dedicated geologists working internationally, reflecting the geological formations and faults that ignore political boundaries, thereby fostering the regional exchange of data and contributing to the training of young geoscientists. As an example, the Geological Survey of Colombia, concerned with capacity building, invited experts to conferences dedicated to staff and students which include some from IUGS (S. Finney, C. Paschier, V. Ramos and R. Oberhaensli). The Japanese Geological survey also initiated a productive international regional collaboration by the creation of the G-EVER

Consortium (Asia Pacific Region Earthquake and Volcanic Eruption Risk Management). This produced the first Eastern Asia Earthquake and Volcanic Hazards Information Map in 2016.

Possibly the most successful and visible cooperation is through the large 1:5 M scale continental maps such as the Geological Map of Asia, the Geological Map of Europe, the Geological and the Tectonic Maps of South America, or the very recent Tectonic Map of the Arctic. These projects, encompassing large areas, also had to reach agreement beyond political and economic arguments related to the advance and the promotion of geosciences.

Of no lesser importance for the compilation of geological maps is the geological time scale and its regular revision. Having provided its own colour chart, CGMW promotes the use of the International Chronostratigraphic Chart of the International Commission on Stratigraphy (ICS) and publishes the upgraded version on the occasion of every International Geological Congress. Mindful of the need to bridge the gap between old and/or obsolete names of geological Stage/Age, CGMW grants free access in its web platform to 'StratTime', an intelligent stratigraphic converter created by B. Vrielynck to facilitate the stratigraphic correlation of more than 1200 stratigraphic subdivisions with the stages of ICS's Geological Time Scale.

As mapping techniques evolve, CGMW has undertaken the addition of digital versions of the printed production. The GIS of the Geological Map of the World at 1:25 M is by far its most emblematic global map and the only one currently available at this scale. The creation of 'Shapefile' versions of CGMW products enables wider use and application of the cartographic data sets, such as the production of the first 30 cm/12" Earth Geological Globe released by the commission in May 2018.



Workshop on the Geological Map of South America, Villa de Leyva, Colombia, 21-26 July 2014 organized by the Colombian Geological Survey. 37 participants from 16 countries (14 South American and 2 European)



Workshop on the Tectonic Map of the Arctic, CGMW Headquarters in Paris, France, 6-8 February 2017. 16 participants from Russia, Germany, France, United States and Canada



Geological Globe of the World, a recent CGMW product



## 36<sup>th</sup> INTERNATIONAL GEOLOGICAL CONGRESS 2-8 MARCH, 2020, DELHI, INDIA

The 36<sup>th</sup> International Geological Congress is being organized in the Indian Subcontinent by the legal entity and a not-for-profit society, named '36<sup>th</sup> International Geological Congress (36IGC)'. The Society was registered in April, 2017.

During the year 2017, various preparatory activities as a run up to 36<sup>th</sup> IGC were undertaken by the Society under the overall guidance of Governing Body (GB) with Secretary Ministry of Mines as Chair, Secretary Ministry of Earth Sciences and President, Indian National Science Academy as Co-Chairs. The Executive Committee (EC) responsible for day to day activities is headed by the President, 36<sup>th</sup> IGC Society. The Local Organizing Committee (LOC) comprises of the following sub-committees headed by respective chairs:

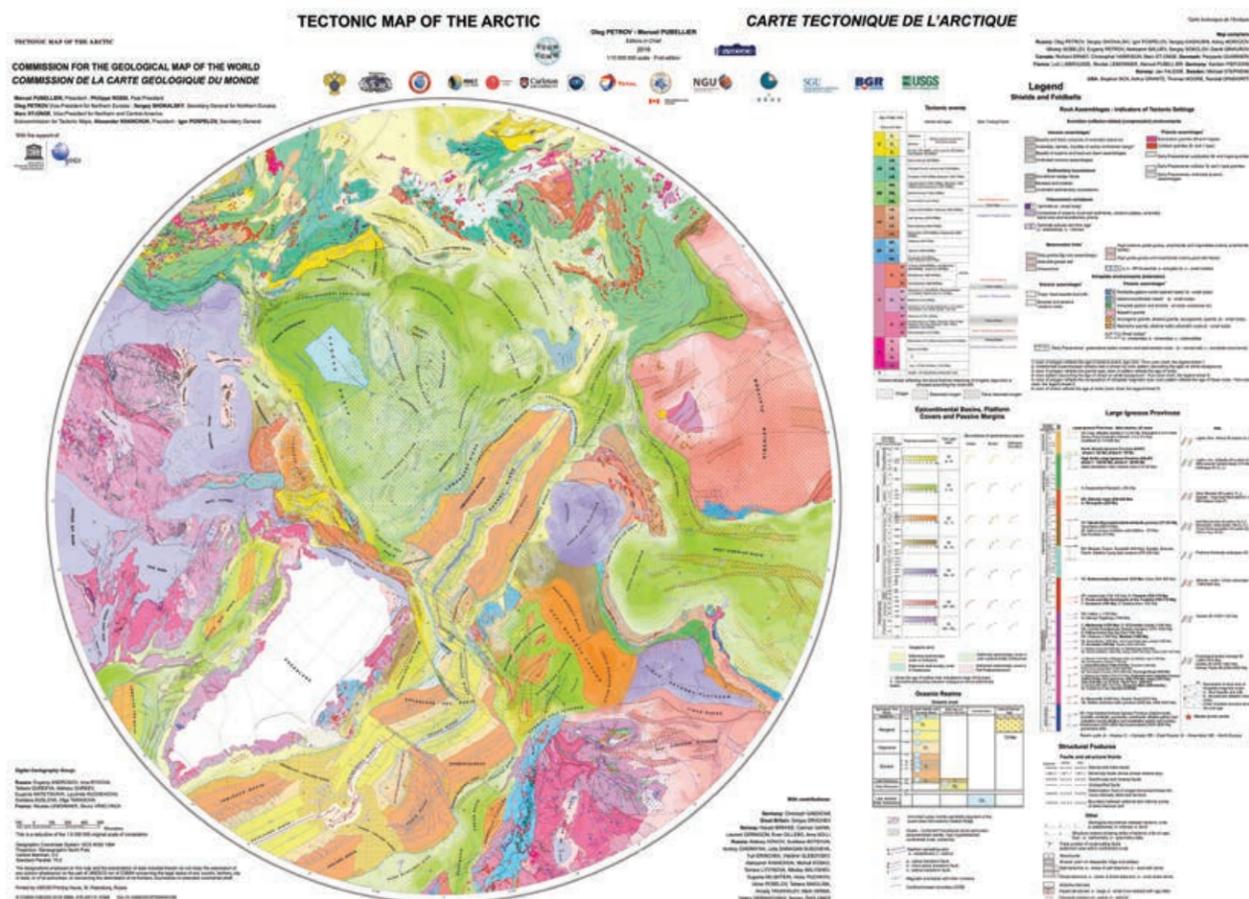
President	Prof. V. P. Dimri, Formerly Director, National Geophysical Research Institute, Hyderabad
Co-President	N. Kutumba Rao, DG, Geological Survey of India (GSI), <i>Ex-Officio</i>
Secretary General	Dr. P. R. Golani, formerly Deputy Director General, GSI
Science Program	Prof. Talat Ahmad, Vice Chancellor, Jamia Milia Islamia, Chair Dr. S. K. Ray, formerly Deputy Director General, GSI, Co-Chair Prof. Partha P. Chakravorty, Delhi University, Co-Chair
Field Trip	Prof. Somnath Dasgupta, IISER, Kolkata, Co-Chair Dr. N. R. Ramesh, formerly Additional Director General, GSI, Co-Chair
Legacy	Dr. Fareeduddin, formerly Director, GSI, Chair
Finance	A. K. Gupta, Deputy Director General, GSI, New Delhi, Chair
Treasurer	S. N. Bhagat, Director, GSI, New Delhi
Sponsorship	Dr. Gopal Dhawan, formerly CMD, Mineral Exploration Corporation, Chair
Geohost	Prof. R. Shankar, Bangalore, Chair
Volunteer	Prof. A. L. Ramnathan, Delhi University, Chair
Science Advisory	Prof. V. P. Dimri, Chair
YES Representative	Tanvi Arora, scientist, NGRI, Secretary General, YES

### Science Program:

The Science Programme sub-committee (SPC) met three times in the year 2017 and approved 42 geoscience themes along with coordinators from Indian subcontinent. There are several themes that broadly fall in the title theme of the 36<sup>th</sup> IGC "Geosciences: The Basic Science for a Sustainable Future".

The SPC also planned to incorporate international experts as theme coordinators for its science program through discussions with the coordinators from Indian subcontinent. Several theme coordinators from other nations are identified and their consent sought for advancing the themes and their likely subthemes/symposia. The First Circular released on 9th February, 2018 invites suggestions for improving the science program of the 36<sup>th</sup> IGC.

A two-day workshop of theme coordinators was held on 27-28 April, 2018 for discussions on geoscientif-



The Tectonic Map of the Arctic Map (TeMAR), completed in April 2018

ic themes and address overlaps, omissions and plans to steer themes.

Consequent upon release of the circular, two more themes viz. the Kimberlite Clan of Rocks and Aquifer Mapping were discussed in the workshop. These two themes have been added in the Science Program during the 4<sup>th</sup> SPC meeting that coincided with the coordinators workshop in April, 2018. The 4<sup>th</sup> SPC meeting has a joint session with the Science Advisory Committee as well.

### Field Trips:

The Indian subcontinent has unique geological heritage that spans in age from Archaean to Recent. Initially 46 pre- and post-Congress field trips are planned to cover the geological superlatives uniqueness and diversity offered by the subcontinent. The selection of these field trips are outcome of proposals that emanated from nine brain storming sessions across India and also through advertisements in the peer review journals. The field trip committee has met three times before release of the First Circular. [Annex- II] (excluding the field trips in co-host & neighbouring countries). The field trips among others include the great Himalayan orogen, granulite terrains in south India, Proterozoic ultrahigh temperature granulite of Eastern Ghat Mobile Belt in India, Central Indian Tectonic Zone having possible transcontinental affinities, large Neoproterozoic felsic-volcanic dominated Malani Igneous Suite in western India, Late Cretaceous Deccan Flood Basalts covering an expanse of over 0.5 million sq. km in western India, the great Bengal delta fans (length 3000 km and width 1000 km), rare dinosaur nestling sites, Proterozoic basins in NW India that host world-class base metal deposits (about 400 Mt) and the great Indo-Gangetic plain (2200 km long and 220 km wide).

Field trip proposals have been received from co-host countries that are under evaluation. The Field Trip Committee have taken initiatives to extend the field trips in Bhutan also. Dry field trip runs have been taken up in March, 2018 at Leh-Ladakh and in western and eastern India.

### Legacy subcommittee:

The Legacy Committee is working towards bringing out the following publications during the IGC:

#### I.The Geodynamic Evolution of the Indian Subcontinent-Hadean to Archean

This is envisaged as the flagship publication of the 36<sup>th</sup> IGC to be published in the Episodes. The subjects and their editors have been identified. The Scope, structure, length etc of the publication are being finalized.

#### II.Compilation of Bibliographic database on Indian Earth System Sciences

The 36<sup>th</sup> IGC plans to publish a compiled bibliographic database on Indian Earth System Sciences. The format, time period to be adopted for selection of the publications, themes etc are being finalized.

#### III.Geotourism of the Indian Subcontinent

This is envisaged as a Coffee Table book covering geotourism sites of the Indian subcontinent. Collection of photographs and write-ups have been started.

### IV.Commemorative Postal Stamp

36<sup>th</sup> IGC is planning to issue a commemorative postal stamp on the occasion of the 36<sup>th</sup> session of the Congress. Work in this direction has been initiated.

### Geohost Program:

This sub-committee (GHPC) envisages offering a very attractive Geo-host programme encompassing 1000 nos. of Geo-host supports (registrations, hospitality and travel supports). This Geohost program is expected to attract deserving scientists from all over the world especially from low income and developing countries to attend the 36<sup>th</sup> IGC. The mapping of the participants across the continents presented during 72 Executive Committee meeting of the IUGS by the Secretary General of the 35<sup>th</sup> IGC at Cape Town will be useful while funding under this program. The Geohost program will also include modalities for funding 121 candidates from IUGS adhering countries and supporting YES.

### Sponsorship subcommittee:

The seed funding for 36<sup>th</sup> IGC comes from Ministry of Mines and Ministry of Earth Sciences of India. To bring in positive financial outcome, the sponsorship sub-committee has identified potential sponsorer from various central ministries, government organizations, exploration and mining companies in public and private sectors in India. The sponsorship subcommittee plans to approach global majors in exploration and mining sectors. The various aspects of sponsorship programme shall be finalized upon consultation with PCO. The subcommittee is also looking for sponsorship of registration for students and research scholars.

### Volunteer subcommittee:

The volunteer programme with a scope to facilitate participation of geoscience students, scholars and professionals is being developed with a special emphasis on capacity building. The Governing Body of the IGC Society has advised to support students in various IGC related activities. The Field Trip Committee has suggested inclusion of students in dry field runs.

### YES Network:

YES network was integrated into the LOC of 36<sup>th</sup> IGC during 2017. YES related programmes viz., field trips, YES congress are being chalked out within the aegis of 36<sup>th</sup> IGC.

### Outreach Programs and PCO:

In the aftermath of nine brain storming sessions that were held by 2017 in various parts of India, the IGC secretariat promoted 36<sup>th</sup> session of Congress during the following conference/congress:

- i)11th Asian Regional Conference of International Association of Engineering Geology at Kathmandu, Nepal in the November, 2017.
- ii)9<sup>th</sup> International Conference on Geomorphology in December, 2017 at New Delhi.
- iii)105<sup>th</sup> Indian Science Congress in March, 2018 at Manipur, India.
- iv)The 36<sup>th</sup> IGC team will attend 15<sup>th</sup> Asia-Oceania Geoscience Society (AOGS) in June, 2018.

v)The 36<sup>th</sup> IGC team shall attend RFG at Vancouver, Canada in June, 2018.

vi)The process for hiring PCO for 36<sup>th</sup> IGC will be completed very soon.

### Science Advisory Subcommittee:

Eminent geoscientists from India are guiding the Science Program of the congress. The meeting of the science advisory, science and coordinators workshop were held simultaneously for better interaction among geoscientists and improvement in the science program. Two more themes viz. the kimberlite clan of rocks and exploration for ground water were added in the science program.

### Finance subcommittee:

The immediate budgetary requirements of carrying out preparatory activities for 36<sup>th</sup> IGC has been made to 36IGC by Government of India and being sourced from Ministry of Mines and Ministry of Earth Sciences on 50:50 basis. Adequate funding provisions are kept by the both the ministries for IGC preparatory activities for the fiscal year 2018-2019 (April, 2018 to March, 2019). We have strengthened Finance subcommittee and Mr. S N Bhagat, Director, GSI is declared as full time Treasurer to facilitate financial transactions of the society.

### Interactions with IUGS:

The IUGS team comprising President Profs. Qiuming Cheng, Secretary General, Stanley C. Finney and Treasurer, Hiroshi Kitazato visited New Delhi, India during 22-24 November, 2017 for discussions on preparatory activities of the 36<sup>th</sup> session of the IGC. The discussions centered among others on science program, field trips, venue and organizational activities.

Taking view of the suggestion of the visiting IUGS team, the Governing Body of the 36th IGC has approved registration fee that is kept significantly lower than the previous two IGCs with an objective to attract larger participation during the event. The registration fee for students is also kept lower to facilitate their participation. The details will appear in the second circular.



IUGS President Qiuming Cheng, Secretary General Stan Finney and Treasurer Hiroshi Kitazato are received by the leaders of the Local Organizing Committee for the 36th IGC



IUGS President, Secretary General and Treasurer meet with entire Local Organizing Committee of 36th IGC

### Other Developments:

The IGC Secretariat plans to involve students and research scholars in preparatory activities for the IGC.

The Secretariat plans to hold second workshop for coordinating science, field trip and other organizational aspects of the Congress with co-host and neighbouring nations in near future.

The IGC Secretariat through Ministry of Mines has taken up facilitation in VISA to prospective participants of the 36<sup>th</sup> IGC. The matter has been taken up with the Ministry of External Affairs Ministry of India.

The 36<sup>th</sup> IGC has been strengthened in manpower with placement of two senior and two young geoscientists.

Theme logo has been finalized and put in the First Circular.



Theme Logo of 36th IGC



Workshop of Theme Coordinators of Science Program, 36th IGC 27-28 April, 2018, New Delhi



Dr. P. R. Golani, Secretary General, 36th IGC addressing the 72nd EC meeting of IUGS 24 January, 2018, Potsdam, Germany

## 37<sup>th</sup> INTERNATIONAL GEOLOGICAL CONGRESS 25-31 AUGUST 2024, BUSAN, KOREA



The Geological Society of Korea (The GSK) and Korea Institute of Geoscience and Mineral Resources (KIGAM) are preparing for the 37th International Geological Congress (2024 IGC) in 2024 in Busan, Korea. Busan is a city surrounded by mountains, rivers and seas and with rich geological resources and natural tourism resources. This will be an unforgettable experience for 2024 IGC participants.

Korea has formed the 2024 IGC Preparatory Committee in 2017. The presidents of the GSK and KIGAM are co-chairpersons. The Preparatory Committee is composed of various fields for the operation of the 2024 IGC such as the Co-Chairperson, Co-General Secretary, Standing Advisor, Overseas Cooperation, Academic Exploration, Event Promotion, Academic Program, Special Session, Public Support, Non-academic Event, Venue, General Management. Preparatory committees, consisting of universities, academic societies, researchers, local governments, convention centers, and PCO, have their own roles and discussions on things to do every quarter. In particular, we are finding sponsors for abundant and stable holding 2024 IGC. Busan Metropolitan City will provide financial and administrative support from the preparation stage to holding 2024 IGC. We are in the process of forming overseas advisory committee for former IUGS executives and IUGS members with IGC experience. The preparatory committee will be in operation until the 2020 IGC in India and plans to launch the

Organizing Committee from 2020. The overseas advisory committee will continue to serve until the year 2024. We will mainly consult with them on-line and invite them as needed.

We will endeavor to make North Korea open to the world through 2024 IGC. Korea is the world's only divided country, but the South-North relationship is improving and there is a possibility of co-hosting the South-North field trip. By developing a field trip course in North Korea, we are pursuing research projects to provide 2024 IGC participants with rare experiences to study geological heritage in North Korea. North-South cooperation in geology is a very important and a pretty big task than any other sector. The joint hosting of South and North will serve as a bridgehead for North Korea's mineral resources development and expand South-North exchanges and cooperation in the geological field. In addition, from Busan one can travel to nearby Asian regions such as Japan, China, and Mongolia within 2 hours by air, so participants can visit not only Korea but also Asia.

Since there is a lot of time left before the 2024 IGC, it is necessary to gradually promote the 2024 IGC to the public and scientists. We have planned a pre-publicity program to encourage young scientists to participant in 2024 IGC and to train the next generations of geological scientists. 'The next generation geological scientist conference' and 'the Korean geology science Olympiad' will be held every year for elementary, middle, high school and college students to

contribute to the future of the geological science community by attracting the public and potential scientists. We are also participating in EGU General Assembly every year to operate the promotional booth and will operate a promotional booth at the 2020 IGC Geo-expo in order to showcase Busan and attract participants from throughout the world.

As part of the preparations for the 2024, we will hold international geological events such as IAH 2018 in Daejeon, CCOP 2018 in Busan and AOGS 2020 in Hongcheon. The holding of the related events will be very helpful for the successful operation of 2024 IGC and attracting world geologists to Busan.



Establishment of 2024 IGC Preparatory Committee



2024 IGC Preparatory Committee Meeting

## ACKNOWLEDGEMENT

The invaluable contributions of the following persons are acknowledged with deep appreciation and gratitude:

Prof. Dr. Stanley FINNEY, the IUGS Secretary-General, for his great efforts in and contributions to compiling the IUGS **2017** Report.

Sincere gratitude are also given to those who have contributed the **2017** IUGS Annual Report.

