

INTERNATIONAL UNION OF GEOLOGICAL SCIENCES (IUGS)

Reporting Form for IUGS Affiliated Organizations 2014

Reporting Organization : International Geoscience Education Organisation (IGEO)
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1. Overall Objectives

IGEO aims to promote geoscience education at all levels, to work for the enhancement of quality in the international provision of geoscience education and to encourage all developments that raise public awareness of the geosciences, in particular among young students.

2. Relate Goals to overall IUGS Scientific Objectives

IUGS gives special consideration to geoscience education, which is the overall objective of IGEO.

3. Structure and Organization

IGEO's Senior Officers are elected every four years by the International Council during the GeoSciEd conference.

The Council currently consists of members from 35 countries (Full details at: <http://www.geoscied.org/officers.htm>). Council meetings are held every two years, alternating between the GeoSciEd conference and the International Geological Congress (IGC). The next meeting will be during the 35th IGC (August 27-September 4, 2016, Cape Town, South Africa).

IGEO's Chair is *ex officio* Chair of the Advisory Board of the International Earth Science Olympiad (IESO), which is IGEO's flagship activity. IESO has its own organisational structure which was described in detail in the annual report for 2012 to IUGS.

4. Interaction with other International Organizations and Projects

IGEO closely relates to the Commission on Geoscience Education, Training and Technology Transfer (IUGS-COGE). IGEO's "GeoSciEd" conference provides every four years a platform for members of all international organizations concerned with or interested in geoscience education at all levels (from kindergarten to university), to present and discuss their activities. Furthermore, teachers, geoscience educators, pupils and officials of ministries for education from all over the world are involved in the annual IESO, where pupils, about 18 years old from across the globe, compete using their geoscience competencies.

5. Chief Products

- *The International Conference on Geoscience Education (GeoSciEd) :*

IGEO's quadrennial "GeoSciEd" conference provides a forum for members of all international organizations concerned with or interested in geoscience education at all levels to present and discuss their activities. It is the most appropriate forum for exchanging ideas, sharing experiences and forging collaborations among participating teachers/geoscientists.

- *The International Earth Science Olympiad (IESO):*

During IESO, gifted secondary / high school students from the world over come together. The students would have been selected at the national level and, along with guest students if any, are accompanied by mentors and observers. The International Jury, consisting of mentors and observers who are essentially teachers, geoscientists or geoscience educators from the participating countries, discuss and finalise question papers for the written and practical tests. IESO also offers the prospect to discuss different approaches to geoscience education throughout the world. Thus, IESO is a unique opportunity to identify best practices/ approaches from around the globe. Something unique about IESO (and something special that sets IESO apart from all other international science olympiads) is the International Field Team Investigation in which mixed groups of students (of different nationalities, diverse cultures and varied backgrounds) work as teams in a friendly and co-operative (as against competitive) manner on a topic both outdoors and indoors and make a Powerpoint presentation. In the 7th edition of IESO in India, a new activity called the 'Earth System Project' was initiated. The topic was the Indian Monsoon. Both these items of activity have been a run-away success.

- *Educational Session/s during the International Geological Congress, every four years.*

Sessions specifically dealing with geoscience education (at different levels and with different perspectives) are convened during the IGC held every four years. These sessions have been able to attract good papers and speakers from different countries.

- *International Syllabus on Earth Science Education*

The recommended minimum syllabus requirement for school-level Earth science education was published on the IGEO and IUGS-COGE websites at the beginning of the year. This followed a survey of the content of national syllabi and an exercise to ensure that the major content of syllabi across the world was covered by the international syllabus. An article on the development of the international syllabus, including a copy of the syllabus itself, will appear in a future edition of *Episodes*.

- *Earth Learning Ideas (ELI)*

The Earthlearningidea website continues to publish a new idea for the teaching of Earth science every two weeks. To date (December 2014), 198 ideas have been published in English and there are more than 500 translations of these activities on the website (or linked to the website) in Spanish, Catalan, Norwegian, Italian, German, Portuguese, Polish, Chinese (Mandarin) and Tamil. The activities are currently being downloaded at a rate of more than 40,000 per month, giving more than 1.5 million downloads in all. The Earthlearningidea blog has now been accessed in nearly 9000 towns and cities of 193 countries across the world. Fifty more activities are already in the pipeline for publication next year and beyond.

- *Public relations activities and communication strategies within the IGEO/IESO membership*

Senior Officers, Council members and members of the IESO community have been publicising IGEO and IESO whenever and wherever they attend meetings/ conferences etc. The official websites of IGEO and IESO also provide useful information to the geosciences community. Besides, IGEO periodically publishes its newsletter which contains not only IGEO and IESO matters but also forthcoming events pertaining to geoscience education, educational resources, reports on geosciences education-related activities. The Newsletter is emailed to desirous scientists/ teachers besides being published at the IGEO website.

6. Chief Accomplishments 2014 and Plans for 2015 - 2018

6.1. Chief Accomplishments 2014

7th International Conference on GEOSCIENCE EDUCATION – 7th GeoSciEd (India)

The quadrennial International Conference on GEOSCIENCE EDUCATION (GeoSciEd) has been organised since 1993 to focus on the crucial role played by Earth sciences in our day-to-day lives and how to educate the population to understand and appreciate this role. The seventh in the series was organized during September 5-9, 2014 at Hyderabad, India (<http://geoscienced2014.webs.com/>). The organizing secretaries were: Prof. R. Shankar, Mangalore University, INDIA, Email: rshankar_1@yahoo.com and Prof. A.C. Narayana, University of Hyderabad, INDIA, Email: acnes@uohyd.ernet.in.

Conference themes were: Geoscience Education Research, Computer-aided Teaching, Geoscience Teaching Methodology, Good Field Work Practices, Geoscience Educational Resources, Geoscience Syllabus. Activities were (1) Paper presentations (oral and poster); (2) A one-day geoscience educational field trip; (3) A post-conference field trip; and (4) A Pre-conference Workshop for teachers on aspects of geoscience education.

As a precursor to the main event, a two-day Teachers' Training Workshop in Earth Sciences (September 3-4, 2014) was organised for school teachers. Around 20 school teachers from India, Malawi and Germany participated in the workshop and gained valuable insights into the teaching of Earth Sciences. They were trained by Prof. Nir Orion, Weizmann Institute of Sciences, Israel.

The conference was attended by around 100 delegates from Australia, Brazil, Egypt, Germany, India, Israel, Italy, Japan, Malawi, Portugal, South Africa, South Korea, Sri Lanka, United Kingdom and United States of America.

Two keynote lectures were delivered: EARTH SCIENCE EDUCATION: INTEGRATING OCEANOGRAPHY AND ATMOSPHERIC SCIENCE by Prof. R. Ramesh and EARTH SCIENCES EDUCATION AT THE CROSSROADS (MANAGING DISCIPLINARY DIVERSITY AND CHANGING PARADIGMS) by Prof. S.K. Tandon.

A one-day field trip was organised to Nagarjunasagar to have a glimpse of the Precambrian Geology of the Eastern Dharwar Craton and to experience the environs of the Nagarjuna Sagar reservoir. During the field work, Prof. Nir Orion, gave practical sheets and asked the delegates to identify the various geological processes that were involved in the development of the rock outcrops.

Feedback from Conference participants:

"Many thanks indeed for all your efforts to provide for us a really splendid conference, Shankar. Everything seemed to go very smoothly to me (apart from my loss of luggage - which has now been returned to me) - we had some excellent presentations and exchanges and were able to give increased momentum to international Earth Science education thanks to the efforts of you and your team. The field trip was inspiring and memorable too. So I am hugely grateful for all your efforts and wish you very well in your role of Chair of IGEO for the next four years" (**Chris King, UK**)

"The workshop was a great experience for me. It was a great challenge for me to run such complicated program with so many unknown components, but the most important aspect and satisfaction for me was my ability to be able to show the teachers that if you believe that learning must be an active process and you cannot teach against what you preach, then you will be able to find the way to do it in any condition.

I felt there positive attitudes towards this approach of teaching and learning. I am experienced enough to know that two days (as good as they could be) cannot change a teaching paradigm, but the enthusiasm of the teachers definitely showed us that we are on the right track and I am very happy that you decided to go on with it and very excited towards our next workshops. The main challenge there will be the coordination with Chris" (**Nir Orion, Israel**)

"I would like to extend my sincere gratitude to the IGEO/ IUGS for the support rendered to me during the Hyderabad conference..... I am sure my participation greatly make an impact to the geoscience sector in my country....please continue extending such type of gestures to other needy participants in the future." (**Yvonne, Malawi**)

"We had the most awesome field trip. Thanks very much for organising it for- simply so much to see and learn. ... Thanks once again for the conference and field trip" (**Ian Mckay, South Africa**)

"Thank you very much for your kind hospitality and everything while my stay in India. Hope to see you soon" (**Ashvin Wickramasooriya, Sri Lanka**)

"I know an Indian saying "whatever happens happens for the good". In India I experienced wonderful moments that I will keep forever. Very thank you for organizing, the warmth and receptivity of students and the wonderful trip post conference" (**Rosely Imbernon, Brazil**)

"...a very memorable event of my life. ...got new ideas during each moment of my stay" (**R. Baskar, India**)

"It was a new type of conference for me, unlike the discipline specific scientific conferences. I wish you organize more and more such events and promote geoscience education" (**K Balakrishna, India**)

We share the happiness of meeting the experts from various regions of the world to discuss and plan for the course of Geoscience Education. We look forward similar meetings in the years to come" (**R. Venkatachalapathy, India**)

"I had excellent discussions with many participants. I realized that the problems of geo-sciences education in India can be solved through strong input of geology/earth science component in school education. Prof. Shankar, you did an excellent job of organizing this conference. I am sure all the delegates went back to their places with good memories." (**Dr. R. Krishnamurthi, India**)

"The conference was very well organised. It was great meeting the delegates and listening to them. My felicitations to you, Prof Narayana & the team for the great conference" (**Prof S N Hasan, India**)

It was a useful and productive conference and i hope to further develop and explore the ideas that i exchanged during the conference and hope to contribute in furtherance of quality geoscience education.thank you very much" (**Rajneesh Bhutani, India**)

A post-conference field trip was organised to the Deccan Volcanic Province-Lonar Crater and Ajanta & Ellora Caves during September 9-13, 2014. The participants were able to see the Deccan lava flows and the associated structures and features, the Lonar Crater, a meteorite-impact crater, and the geology and structure of the rocks in the Ajanta and Ellora caves.

Feedback from Field-trip participants:

'A very exciting excursion.. I must come again to see a great escarpment !' (**Takashi, Japan**)

'Very nice field trip !! I talk this trip to my students'. (**Yosiho, Japan**)

'The field trip was really amazing from geology and even human and cultural point of view. Thank you so much for all the organisation and kindness'. (**Roberto, Brazil**)

'The field trip was wonderful. I loved every single bit. Fantastic scenerie...'. (**Sylke, Germany**)

'Thank you very much for the wonderful field trip. I enjoyed every day and depart very happy'. (**Kirsten, Germany**)

'What an amazing trip, led by amazing geologists. It was truly a lifetime experience'. (**Eric, USA**)

IGEO Council Meeting (September 6, 2014)

At the Council meeting held during the 7th GeoSciEd conference (September 5-9, Hyderabad), the following Senior Officers were elected for the quadrennium 2014 – 2018:

- SHANKAR Rajasekharaiah, India (Chair)
- Roberto GRECO, Brazil (Incoming Chair)
- Sylke HLAWATSCH, Germany (Past Chair)
- Anish Kumar WARRIER, India (Secretary)
- Gabriele OBERMAIER, Germany (Treasurer)
- Bronte NICHOLLS, Australia (Newsletter Editor)
- Chris KING, UK (Adviser)

Further Decisions:

(1) 7th GeoSciEd Conference (2018)

Host country:

Brazil (Venue: University of Campinas, 2 hours by road from Sao Paulo)

Local organizers:

Roberto Greco, Celso Dal Ré Carneiro and Pedro W. Gonçalves

Themes:

- Implementing the International Syllabus
- Geoscience Education Research (Field trips, Class room, Informal)
- Best practice in geoscience teaching (Evaluated conceptions)
- Innovative teaching ideas (Classroom, Outdoor, Informal etc.)
- Others

Session Formats:

- Interactive poster sessions
- Round-table discussions
- Gallery walks
- Presentations (10 + 5 minutes)

Time line:

- *24 months prior to the conference date (to be presented at IGC):* General invitation with dates, planned field trips, themes, and a request to contribute ideas.
- *18 months prior to the conference date:* First circular with invitation to submit abstracts and finalised themes.
- *12 months prior to the conference date:* Second circular with full program and information on accommodation etc.

(2) IESO Test quality

- The local scientific committee provides questions to experts in Earth Science Education, who are members of the Test Commission.
- The IGEO Chair will nominate them out of this group and ensure that they are not involved

with the preparation of students of the national teams.

- The experts use these and other questions in order to produce the final test paper according to the IESO syllabus and according to quality standards of testing (guidelines).
- The Chair will ensure that the work will be done on the basis of guidelines known to everybody involved (Internet).

The grant kindly provided by the IUGS was of great use in supporting the participation of Developing Country participants. The grant was utilized as follows:

Table 1. IUGS Grant for Participation of Countries in the 7th GeoSciEd Conference

Sl. No.	Country	Details of participants	Details of assistance provided	Total no. of participants
1	Sri Lanka	A.K. Wickramasooriya	Partial travel expenses 190 Euros	One
2	South Africa	Gillian Drennan	Partial travel expenses 200 Euros	One
3	Brazil	Rosely Imbernon	Partial travel expenses 200 Euros	One
4	Malawi	Yvonne Chasukwa	Partial travel expenses 800 Euros	One
5	India	Sachin Sabnis	Partial travel expenses 100 Euros	One
6	India	Rajneesh Bhutani	Registration fee waiver 60 Euros	One
7	India	R. Baskar	Registration fee waiver 60 Euros	One
8	India	M. Prashanth	Registration fee waiver 60 Euros	One
9	India	Anish K Warriar	Registration fee waiver 60 Euros	One
10	India	Ajit V. Vartak	Registration fee waiver 60 Euros	One
11	India	B.G. Harshavardhana	Registration fee waiver 58 Euros	One
TOTAL			1848 EUROS	ELEVEN

Sl. No. 6-11 were offered assistance only after other Third World applicants regretted their inability to attend the conference.

8th International Earth Science Olympiad (IESO), Santander, Spain

The International Earth Science Olympiad (IESO) debuted in 2007 with the objectives of raising students' interest in and public awareness of Earth sciences, enhance the quality of earth science education at all levels, promoting international co-operation in the exchange of ideas and resources pertaining to earth science education. The 8th edition of IESO was held in the Palacio de la Magdalena, Santander, Spain, during September 22-29, 2014 (<http://www.ucm.es/ieso2014/>). Dr Juan D Centeno (Email: juande@ucm.es), University Complutense of Madrid, was the Chair, Organising Committee and Dr Xavier Juan Pons (Email: xjuan03@gmail.com), IES. Sant Quirze del Vallés, the Chair of the International Jury. Ninety students, 44 mentors and 42 observers from

24 countries participated. The inauguration ceremony, besides the customary speeches and the welcoming of the participating national teams, had Spanish classical music and other cultural presentations.

The International Jury (comprising the mentors and observers from all the participating countries) scrutinised the question papers (for written and practical tests) prepared by the Spanish Scientific Committee and finalised them. This year's question papers had a larger number of questions with an Earth System Science approach. The question papers with multiple choice questions focussed on (a) Charles Darwin's voyage and his discoveries, (b) the archaeological sites discovered by the Leakey couple in the Olduvai Gorge, Tanzania, and (c) Martian geology. Mentors and observers of non-English speaking countries translated the question papers to their respective mother tongue. The International Field Team Investigation (ITFI) this year centred on beach activity. Mixed groups of students made sediment peels across beach sand sections, studied the structures and made inferences from them. The findings were presented through Powerpoint before a Jury which decided on the award winning teams. Geological sight-seeing trip offered the opportunity to visit an old zinc mine, the Altamira cave site (with paintings dating back to ~ 17000-13000 years before present), Santalena, and other places.

Gold, silver and bronze medals were awarded to students based on their performance. Best Performance Awards were also given in Geosphere, Astronomy, Hydrosphere and Atmosphere sections.

International Jury Meeting during IESO, Santander

At the meeting of the International Jury, some sweeping changes were made to the IESO statutes regarding how IESO will be conducted in the coming years. First, it was resolved to formally adopt the Earth System Science approach in IESO testing for IESO 2015 and beyond. Second, a new Examination Board will be nominated by the Chair, IGEO, consisting of members who are normally earth science educators/ researchers/ high school teachers. They should not be involved in training the national team of his/ her country for the particular year. The Board will:

- receive ideas and questions for IESO,
- finalise the question papers as per the original syllabus of IESO,
- maintain uniformity in testing standards, and
- ensure that the Earth System Science approach is used in preparing questions.

Lack of adequate financial resources has been a stumbling block to the effective participation of developing countries, particularly from Africa, over the years of IESO's inception. The grant kindly made available by the IUGS for IESO 2014 helped in enhancing the participation of Developing Countries. The grant was utilized as follows:

Table 2. IUGS Grant for Participation of Countries in IESO, Santander, Spain

Sl. No.	Country	Details of participants	Total no. of participants
1.	Nigeria	<i>Mentors:</i> Kingsley Imade and Santos Momoh <i>Students:</i> Oluwafunmilayo Awurawaiye, Chisom Esonu, Chiagoziem Onyema and Ogirima Ishaqu	Six
2.	Portugal*	<i>Observer:</i> Jorge Bonito	One

* As Malawi and Morocco did not respond to the financial offer made for participation in IESO, an Observer from Portugal was offered funds so that Portugal can organise its national team and participate in next year's IESO.

Results of the joint meeting of the Coordinating Committee and IESO Advisory Board

A joint meeting was held in the sidelines of the 8th IESO in Santander, Spain and discussed issues relating to standards of testing in IESO in the coming years and also efforts to enhance the participation of more countries in IESO in future.

Coordinating Committee:

Chair: Yoshisuki Kumano, Members: Jose Sellez-Martinez (Argentina, Organiser 6th IESO), Shankar Rajasekhariah (India, Organiser 7th IESO), Juan D. Centeno (Spain, Organiser r 8th IESO), Evgeny Nesterov (Russia, Organiser 9th IESO), Yoshisuki Kumano (Japan, Organiser 10th IESO), Kenichiro Hisada (Japan, Guest), Representative from Thailand, Guest, Shankar Rajasekhariah (India, Chair: IESO Advisory Board), Nir Orion (Israel, Chair: Syllabus Commission), Gerard Bonheure (France, Chair: Test Commission).

IESO Advisory Board:

Chair: Shankar Rajasekhariah (India, IGEO Chair), Members: Hendra Amijaya (Indonesia), Miguel Cano (Philippines), Celso Dal Ré Carneiro (Brazil), Chun-Yen Chang (Taiwan), Ian Clark (Australia), Roberto Greco (Brazil), Yoshisuki Kumano (Japan), Nir Orion (Israel), Jose Seles-Martinez (Argentina), Moo-Young Song (S. Korea).

News from the Commissions

The Test Commission elected Gerard Bonheure as the Chair. The Test Commission wants to recommend criteria for high quality items and also to publish examples. In addition, a discussion about the use of multiple choice questions with more than one correct answer has begun.

Preparations for the 9th IESO (Brazil)

The 9th edition will be organised by the Federal Institute of Knowledge, Science and Technology for the South of Minas Gerais (IFSULDEMINAS), in partnership with the University of Campinas (UNICAMP) and support from the Federal Rural University of Rio de Janeiro, the Federal University of Itajuba and other Federal Institutes of Education in Brazil.

Preparations for future editions of IESO

- 9th IESO, 2015, Brazil. Contact: Roberto Greco (robertogreco01@yahoo.it)
- 10th IESO, 2016, Japan. Contact: Kenichiro Hisada (hisadak@geol.tsukuba.ac.jp)
- 11th IESO, 2017. This slot is open but serious efforts are being made by three countries to grab the opportunity of organising the 11th edition.
- 12th IESO, 2018, Thailand.

International Syllabus on Earth Science Education

The final version of the syllabus was prepared, published (at IGEO website) and presented during the 7th GeoSciEd conference during September 2014 at Hyderabad, India.

- Cross-referencing of the final version with materials suitable for teaching the syllabus – These will be drawn from the bank of Earthlearningideas (www.earthlearningidea.com), a resource developed in association with IGEO and IUGS-COGE¹.
- Publication of the results in appropriate publications, including *Episodes* of IUGS.
- A session was organised in memory of David Thompson at the 7th International Conference on Geoscience Education in India to discuss and disseminate the international syllabus, whilst focussing on teaching approaches and activities appropriate for teaching the syllabus.

Public relations activities and communication strategies within the IGEO/IESO membership

IGEO website: IGEO members and the public are informed of IGEO'S activities through the IGEO website (<http://www.geoscienced.org/>).

IESO websites: The IESO website has been changing with every new edition of IESO. An IESO website with general information on IESO is now available (<http://www.ieso-info.org/>) from where the websites of earlier editions of IESO can be accessed. In addition, this general website provides details of the Syllabus, the Statutes, Commissions and Commission members. We plan to add examples of task types and suggestions for teaching materials and strategies that will be valuable in developing best practices in geoscience teaching worldwide.

Facebook: (<http://www.facebook.com/pages/International-Geoscience-Education-organisation/126146467450938>).

6.4.3 Internal Communication Platform-Trial

The Test Commission of IESO desires to work efficiently between successive editions of IESO using the Internet. The platform choice for the interval between the 6th and the 7th editions of IESO proved difficult to use. In view of the new Examination Board taking birth, the task of preparing and discussing questions for the next edition of IESO will be through Internet and Skype.

6.5. Resourcing Future Generations

The Senior Officers of IGEO are informed about the IUGS initiative, "Resourcing Future Generations", and are discussing it.

7. Specify how any IUGS Allocation for 2014 was used.

IUGS kindly made available a grant of 3700 Euros to IGEO, which we most gratefully acknowledge. Details of how it was spent are shown in the following Table:

¹ See *Earthlearningidea* update above.

IGEO Annual Report 2014

Item	Received	Spent
Grant received from IUGS for 2014	3700 Euros*	
Grants provided to Third World teachers/ earth science educators to participate in the 7 th International Conference on GEOSCIENCE EDUCATION, September 5-9, 2014, Hyderabad, India (Details in Table 1) (Scanned copy of receipts from grantees as Annexure)		1848 Euros
Grants provided to teams from Third World countries to participate in the 8 th International Earth Science Olympiad, September 22-29, 2014, Santander, Spain (Details in Table 2)		1416.16 Euros
Unspent balance		435.84 Euros
TOTAL	3700 Euros	3700 Euros

* (3720 minus bank commission of 20 Euros)

We request IUGS to permit us to utilise the unspent amount for IGEO's activities in 2015.

8. Budget Request with Justification for 2015 (only applicable to low income affiliates)

While thanking IUGS for its financial support to and patronage of IGEO, we request for IUGS grants for the International Earth Science Olympiad (IESO) 2015 and the International Conference of Geoscience Education (GeoSciEd)

- International Earth Science Olympiad (IESO)

The International Earth Science Olympiad (IESO) invites national teams (4 students under 18 years of age accompanied by two mentors) to present their Earth Science knowledge and compete with teams from all over the world. During this event, students also forge new friendships that may last for their entire lives, while their mentors and guests (teachers, geoscientists, geoscience educators, geoscientists from the ministries for education) discuss the tasks and identify best practices of geoscience education in the various countries as well as modes of improvement. Again, teams from nations with poor financial background are not able to join the Olympiad and reap the benefits. For the IESO 2015 in Brazil, we request generous funds from the IUGS to support the participation of at least four national teams from countries with poor financial background, giving preference to countries that will debut in IESO. This would stimulate more new countries to participate in IESO.

Request: 12000 USD

- International Conference on Geoscience Education (GeoSciEd)

The International Conference on Geoscience Education (GeoSciEd) reaches out to the international community of researchers in geosciences, researchers in geoscience education as well as teachers of various geosciences-related subjects. Together, they present and develop new ideas that help improve the quality of geoscience teaching across the world. They also collect and discuss ideas and strategies for geoscience outreach activities. The 9th GeoSciEd will take place in Brazil.

Request: 5000 USD

9. Does your website have a link to IUGS?

Yes.