

International Earth Science Olympiad (IESO) 2023 – A Report

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Since 2007 India has participated in the International Earth Science Olympiad which is organised to foster earth science education and concepts in atmospheric and earth sciences and sustainability of earth resources. India hosted the 7th International Earth Science Olympiad at Mysore in 2013. Ministry of Earth Sciences (MoES), Government of India, New Delhi, supports and sponsors the Indian National Earth Science Olympiad (INESO) and International Earth Science Olympiad (IESO) for school students (IX to XII) as a part of its outreach programme and this programme is facilitated by the Geological Society of India, Bengaluru.

The 16th IESO-2023 was hosted in virtual mode by International Geoscience Education Organisation (IGEO), a non-governmental organisation and an affiliate of the International Union of Geological Sciences (IUGS). The 16th IESO-2023 programme was organised during 20-26 August 2023 and 179 students, 12 guest students, 56 mentors and 26 observers from 32 countries participated in this international event. The IESO-2023 Steering Committee members were represented by Nir Orion, Chair; R. Shankar, Co-ordinator; Xavier Juan, Bing Shen, Greg McNamara, Tiago Ribeiro and Sharon Locke as Members.

Team India was represented by eight students: Apoorva Jha, Arpita Maurya, Badri, V.K., Daksh Lahoty, Kshemaahna Nagi, Manya Jain, Rigveda D. Gupta, and Rigzin Lhamo. These students were selected based on their meritorious performances during the national entrance test in which 2569 students participated from 59 test centres, and the tests conducted after a training camp. The training camp was organised

in virtual mode during 25th June 2023 to 11th July 2023 in which 30 students, selected based on the national entrance test, participated.

The inauguration of the 16th IESO-2023 was held on the 20th August 2023. Prof. R. Shankar welcomed the participants and gave a brief introduction to IESO-2023 and this was followed by Bing, Nir, Greg and Susanna, in charges of different events, who spoke on different activities that were organised during the IESO-2023. Dr. Nir, Chair, IGEO and IESO, remarked on earth science education and how IESO has been contributing in that direction. He also shared his views on the importance of the earth science education in school curricula.

Nir Orion, in-charge of the National Team Field Investigation (NTFI), briefed on the process of NTFI, which is a study conducted by a national team of four members of a project involving a field examination, collection of samples, lab analyses, synthesising the results, drawing conclusions and present the results and conclusion by way of a presentation to an international jury. The following two projects were carried out by the Indian team members and the Team-A won Silver and Team-B Bronze medals (see the table).

Team A: Application of low-cost indigenous Earth Science Materials and proposal of a multiuse novel structure to redirect storm water runoff and eliminate its Contaminants.

Team B: Carbon Sequestration using Urban Grey Waters; A Green Initiative

R. Shankar in-charge of Earth System Project (ESP) explained the activity. ESP is team event of students drawn from different nations,



Fig. 1. Indian Team members with Dr. Hema Achyuthan, the National coordinator. Left to right: Arpita Maurya, Manya Jain, Rigzin Lhamo, Kshemaahna Nagi, Daksh Lahoty, Apoorva Jha, Rigveda D. Gupta and Badri Vishal K.

Sl. No	Name of the Student	Sex	Place	NTFI	NTFI	ESP	DMT	Art			Pledge
1	Kshemaahna Nagi	F	Bengaluru	Team A	Silver	Yes	Gold	E	VG		Yes
2	Badri Vishal.K	M	Bangalore	Team B	Bronze	Bronze	VG	VG	G		Yes
3	Apoorva Jha	M	Bhopal	Team A	Silver	Silver	VG	VG	G		Yes
4	Arpita Maurya	F	Kota	Team B	Bronze	Yes	G	Yes			Yes
5	Manya Jain	F	Ahmedabad	Team B	Bronze	Bronze	VG	VG			Yes
6	DAKSH LAHOTY	M	Bangalore	Team B	Bronze	Gold	Silver	Yes			Yes
7	Rigzin Lhamo	F	Leh	Team A	Silver	Yes	Gold	VG	VG	G	Yes
8	Rigveda D Gupta	M	Bengaluru	Team A	Silver	Yes	Silver				

E=Excellent, VG=Very good and G= Good

grouped together, working on a topic that encompasses many spheres of the Earth System. The groups are assigned a topic each and need to collect and analyse the data available on the net. Each team is to make a poster/PowerPoint presentation which is evaluated by an international jury based on a rubric system. The four topics that were offered in IESO-2023 includes: (1) El Niño and the earth systems, (2) Permafrost thaw, (3) Ocean surface temperature records and (4) The case for/against terraforming Mars

Bing Shen was In-charge of Data Mining Test (DMT). The DMT theme for IESO-2023 was “The present is the key to the past”. The DMT evaluates student’s ability to understand the principles of earth sciences given the geological data and background checking online materials, analyse the data and draw a neat summary and conclusions. In DMT, individual students were asked to explore online data accessed via links provided after which they have to answer certain questions sequentially. These involved calculations using a calculator, and more complex ones which could be solved online at the website provided. The answers were checked by an international jury. In this event only the first four students from a country awarded medals and others are given certificate of merit – Excellent (=Gold), Very Good (=silver) and Good (=Bronze). The Indian team members won two gold, two silver medals and certificates of three very good and one good.

Greg McNamara in-charge gave an account of Art in Earth Science which provided a platform to IESO participants to demonstrate their skill to present their understanding of earth science in any art form such as painting, photography, graphic design and poetry. Student participants could submit up to three works of art that are related to

Earth Science, and could take the form of Art and Graphic design (created by hand or by digital processes); Photography (unaltered images, software manipulated images and blended images); Poetry and prose in written form; Sculpture; Film/Video; Music/Audio (e.g., Song, Instrumental, spoken word); Mixed media (e.g., Film of a kinetic sculpture accompanied by poetry or music). For this event entries were received through Padlet website and were qualified and displayed for the IESO community to appreciate. Entries were judged by an international jury as well as by the IESO peers. The students were given certificate of merit – Excellent, Very Good and Good.

Susanna Occipinti, in charge of Earth Science Pledge (ES)



Fig. 3. Distribution of Certificates by Dr. Jagvir Singh



Fig. 2. Indian Team members with (from left to right), Dr. V. N. Vasudev, Mr P. Sahoo, Prof. Devesh Walia (mentor), Dr. Jagvir Singh, Scientist G, MoES, Dr. P. Krishnamurthy, and Mr. N. Rajendran



Fig. 4. Address by Dr. Hema Achyuthan after announcement of the results



Fig. 5. Indian Team members with Hon. Minister Shri Kiren Rijiju and Prof. Harsh K. Gupta, Dr. M. Ravichandran, Secretary, Mentors and Ministry officials



Fig. 6. The Hon. Minister Congratulating Miss. Rigzin Lhamo for her achievements

explained the activity that offers IESO participants an opportunity to express their ideas and plans on how they intend to utilise their earth science knowledge and experience, in understanding the global

WHY I CANNOT WRITE POETRY

BY: IN-01
KSHEMAAHNA NAGI

"Sunlight and scintillating color
Daffodils dancing with gaiety and verve,
Nightingales and babbling brooks,"
Are but words on crisp, crinkled pages that I read,
Odes to temperate summers by poets long dead.
For the children of the past were nursed by the buds of May,
Lapped by gentle waves.
But I-
I am a child of the future:
Rocked by the skeleton hands of bare trees.
The roaring and tumbling tsunamis were my lullaby.
Landslides like a blanket upon me,
That began when the climate changed.
We live below the surface now- in caves.
Their dark, stuffy, sweltering, charred walls closing in on us.
Reading incomprehensible poems of by gone days,
Wishing our ancestors had meant their ways.
They say monkeys can type Shakespeare given enough time.
But I cannot-
For monkeys lived in trees, back when nature nurtured us
They could understand what the Bards experienced.
I do not understand the Bards.
I do not understand how summer days can be temperate or lovely.
I do not understand how the sunlight-
That once rained down as spoonfuls of golden honey,
Now beats down like the fire breath of a dragon.
The breath of life-
Now the breath of death.
I cannot write poetry,
For nature no longer nurtures- and it is our doing."

Poem by Miss Kshemaahna which won the merit of Excellence

problems that are affecting humanity, and how earth science education can benefit society at large. The IESO pledge was submitted in the form of a short-written text or a video clip posted on a social medium of student's choice. Links to all IESO Pledge entries were published on the IESO website to enable everyone to go through them. Entries were refereed by an international jury.

All the events were conducted in a smooth and timely manner. IESO closing and valedictory function was organised on 26th August 2023. The valedictory programme began with Dr. R. Shankar welcoming the participating teams, mentors and observers. Further, three mentors and three students were invited to give their feedback and impressions on IESO-2023. They expressed satisfaction about the conduct of the event. One opinion was to have offline edition soon as earth science in particular demands face-to-face interactions and field studies. Students expressed that IESO-2023 event was a unique experience, they were happy interacting with friends from different countries during the ESP event and that they learnt a lot on Earth System Science subjects through various IESO topics. This was followed by remarks from Nir, the Chair, IGEO and IESO. He announced that the 17th IESO programme will be held in Beijing, China during August 2024. Bing Shen made an impressive presentation on the host city and institution (Beijing and Peking University) and the activities planned for the next year's IESO 2024 event. Several event managers such as Dr. Bing for Data Mining Test, Dr. R. Shankar for Earth Science Project, and Dr. G. McNamara for Arts and Pledge welcomed the

gathering and shared their thoughts on the topic they conducted. The results of the events that concluded were announced by each event coordinator. Finally, Dr. R. Shankar thanked everyone including student participants, mentors, observers and extended appreciations to the Chair and members of the Steering Committee for their enthusiasm, time, energy and efforts (and sitting through meetings at odd hours), the Weizmann Institute of Science, Israel for the Zoom platform and volunteers.

From the Indian side the valedictory function was graced by the presence of Dr. Jagvir Singh, Scientist-G, MoES. Prof. Harsh Gupta, President, Geological Society of India, addressed the students and the parents virtually and congratulated the students for their interest in the earth science and for bringing laurels by winning number of medals. Our students worked hard, performed very well, and won three gold, seven silver, and six bronze medals in different events with certificates such as excellent, very good, and good in Pledge, arts, and poetry (details given in Table format). **A mention must be made here that Ms. Kshemaahna Nagi's poem has been accepted for publication in the 14th issue of the Consilience journal.** All the student participants had an audience with the Minister for Earth Science, Honourable Minister Shri. Kiren Rijiju on 27th September 2023 and he congratulated the students and encouraged them to work hard and achieve the best in their studies and their goals in life.

The Geological Society of India, Bangalore, and the MoES, New Delhi, HBSCE, Mumbai, is proud of Team India and congratulate the students, the National Coordinator, the Faculty, and resource members for the success and neat coordination of this year's IESO-2023 program. The 16th 2023-IESO event ended successfully with a sense of achievement and satisfaction to all. The list the activities and the results are available at <http://www.igeosied.org/activities/ieso-2/ieso2023/>.