

International GeoScience Education Organisation

October 2021 Newsletter

http://www.igeoscied.org/

2018 – 2022 IGEO Executive Committee

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- p. 2 President's message
- p.3 International Geoscience Olympiad 2021 (IESO 2021)
- p. 6 Summary of IESO 2021 National Team Field Investigations
- p. 7 IESO 2021 Art
- p. 13 Earth System Pledge and Mission to Mars.
- p. 14 The Nnetwork of Educators in Earth Sciences of Argentina (REDCITIA) has been created

p. 15 The Corona pandemic as a test case for Education System - has the Israeli Earth science program passed the test?

President's Message

Dear IGEO members,

This issue of the IGEO news letter presents a detailed resume of International Earth Science Olympiad (IESO) edition of 2021.

This year for the first time IESO was held on-line due to the pandemic situation after been cancelled in 2020. We decreased from 43 countries in 2019 to 33 countries in this edition that can be considered a success due the circumstance.

IESO is a tool used by IGEO to promote innovative education activities around the world. It's a competition for school students selected by their respective national Olympiads. The online format required some adaptation. The practical test was cancelled, the written test became a Data Mining Test, an on-line test based on set of real earth science data available online. The international Team field Investigation, an active learning activity based in a real science contest with social interaction and cooperation among students of different nationality became a National Team Field Investigation and that challenge the national mentors to prepare appropriate educational contest for their students. The Earth System Project maintain the interaction and cooperation among students of different nationality. This year some new educational activities have been proposal as the cooperative activities called Mission to Mars made by the use of an App for smartphone, the Earth System Pledge where students declare their commitment of use their Earth System knowledge for the well being of humanity and the planet.

It seems that participating students had a lot of fun and good memories of the experience.

Next year (2022) will also be on-line. This give the opportunity for countries that have not yet participate to get a taste of IESO without the complication of fund rising for expensive international travels.

Here you find the IESO website <u>http://www.ieso-info.org/</u> and here the list of countries that are regularly participating with the respective national website when available <u>http://www.ieso-info.org/national-ieso-committee/</u>

In this issue you can also find information about the creation of the Network of Educators in Earth Sciences of Argentina (REDCITIA). That is a great news, IGEO wish all the best to this national network of Earth Science Educators and we hope that this example will stimulate the creation of similar networks in many of the countries that have not yet a national community of Earth Science Educators.

At the moment 47 countries are represented in IGEO, do you know your national delegate? Here you find the list: <u>http://www.igeoscied.org/about-the-igeo/officers/</u>

Your countries is not in the list? Maybe you could create a local network in your country and propose a couple of delegate for the IGEO council.

This news letter finish with a really touching report about Earth Science Education experience realized in Israel during the pandemic.

Enjoy the reading,

Best wishes,

Roberto Greco

International Geoscience Olympiad 2021 (IESO 2021)

By Jean-Luc Berenguer

IESO is an annual Earth Science educational event for secondary school students. The International Earth Science Olympiad is not just about competition among students. One of the principal objectives of IESO is to promote international co-operation and forge bridges of friendship among young, talented students across the world. It is a flagship activity of the International Geoscience Education Organization (IGEO – www.igeoscied.org) to promote earth science education in secondary schools.

The 14th edition of the IESO took place from 25 to 30 August 2021. This edition was held online.

Despite the delicate pandemic situation in some countries, where the preparation of the national selections was strongly disrupted, 199 high school students participated, representing 33 countries.



Taking advantage of this online edition, new types of tests were proposed such as the 'data mining test'.

Access to the data online to resolve case studies.

We are accumulating large amounts of data of all types (numerical, images, text, etc.). Exploiting them requires the mining and exploitation of these data.

The development of digital technology makes it possible to generate raw scientific data which must be processed and interpreted to feed the Research (including geoscience).

At school, it is often the synthesis produced by the scientists that is proposed to the students to serve the construction of their investigations.

The objective of the **Data Mining Test** is to imagine pedagogical scenarios allowing to raise awareness among students to one of the principal elements of geoscience: data!

This allows students to understand how scientists can acquire/process/exploit data to obtain knowledge, particularly using digital technology.

For IESO 2021, the Data Mining Test consisted of a scientific investigation using data online.

A series of questions will guide the student, step by step. Knowledge can help the student ... but analysis of the data may be sufficient!

Two case studies were proposed: Volcanic paroxysms of the Etna volcano in 2021 (satellite images, GPS data, seismic tremors ...) and a virtual investigation in an old bauxite mine.



Question forms and data resources are still online at http://edumed.unice.fr/ieso2021

184 students from 33 countries completed the test successfully! Thanks to EDUMED Observatory team (University Côte d'Azur, France) for this new test. This experiment seems to have been appreciated by the students.

A workshop to share hands-on activities for the classroom

An online workshop was also offered to all teachers supervising the students. An online seminar was organized and leaded by the EGU field officers, and some forty teachers discovered the field officers' initiative.

The participation of the EGU was beneficial, in particular:

in helping with the registration fees of three countries for their first participation,

and finally in mobilizing the team of EGU field officers for the seminar.

EGU Field Officers' Teachers Workshop Xavier Juan Anna Anglisano Gina P. Correia	GEOURE	Cella Readon Culla Readon Culla Readon Rate Rate Rate Rate Rate Rate Rate Rate	OSCIENCE Guilarre Couperbox Bochos Anso Bortas Marcia	Eccucation	Anne Field (Vanise Bourgeon Bootone and office	Construction
Giulia Realdon IESO 2021 27th August 2021 Economic Brondennes Union	Ana Arguara Ana Arguara Ana Arguara Ana Arguara Ana Arguara Ana Arguara	Cont providing professional development to school teachers and future teachers, from primary to secondary schools, in teaching the elements of geoscience appropriate for their teaching curriculum, through interactive workshops. Workshop topics: Plate tectonics; Rock cycle; Seismology; Time Scale and history of Earth; Volcanology Geopark training courses.				teachers and schools, in riate for their nops. e Scale and courses.

Thanks to IGEO/EGU Field Officers team!

IESO 2021 Summary of National Team Field Investigation (NTFI) Nir Orion

Introduction

The main reason behind IESO is to inspire earth science educators with the 'state of art' teaching strategies and techniques. Therefore, it includes activities that are unique and special when compared to other science Olympiads (e.g., the International Team Field Investigation (ITFI) and the Earth System Project (ESP). These activities demonstrate the essence of the scientific exploration of our physical world. A good scientist can define a clear research question, conduct a study based on modern research tools and analyze the results through logical sequence thinking.

The National Team Field Investigation (NTFI) is the online version of the International Team Field Investigation (ITFI) carried out during IESO so far. Unfortunately, the implementation of the ITFI all these years was only partial. Thus, NTFI was an excellent opportunity to understand the meaning and objective of ITFI. Moreover, it was an opportunity for a rigorous evaluation process.

Outcomes

Despite the local constraints created by the COVID pandemic in each country, mentors have shown creativity and determination in finding local solutions. Finally, 36 studies from 23 countries were prepared and presented.

The same evaluators (None of them was a mentor) evaluated all the studies. Moreover, an evaluator could not assess a project presented by students from their country. The evaluation was based on a rubric of 19 items. Twelve items evaluated the quality of the research project (65% of the final score), and seven items considered the presentation's quality (35% of the final score).

The grading scale of the projects included the three following levels."

Excellent: Projects that scored in the range of 88 - 100 (20% of the studies).

Very good: Projects that scored in the range of 80 - 88 (25% of the studies).

Good: Projects that scored in the range of 70 - 80 (30% of the studies).

The following are two representative mentors' feedbacks that indicate an overall satisfaction from the process and the outcomes of the NTFI.

"...It opens research avenues for the coming years with my undergraduate students, and it is fantastic we could start this with high school kids in the context of IESO."

"...this part (the NTFI) was the most appreciated by our students: they really enjoyed working together and playing the role of true scientists either in the field as analyzing the data collected and raising conclusions..."

Let's hope that mentors will introduce the NTFI as an integral part of the earth science teaching program regardless of the IESO.



IESO Art and Science - Sharing of Earth Systems Art and Creativity

By Tom Tailer

All IESO students are excellent at Earth Science, but their talents do not end there. Many of them are excellent artists in various media including the visual arts, writing, and theater arts. This is an opportunity to share some of their poems, paintings, sculptures, rap songs, earth science memes etc. Submissions should be socially appropriate and address environmental or Earth systems issues or concepts. Many of the submitted artistic pieces have been included in the closing ceremony.

This is a great place for students to communicate their emotions regarding the science that we study. Students can also use this international publication of their art on their resumes.

There are two categories of Art. Earth systems art represents a concept of message related to Earth Systems. Art for Art's sake is something beautiful that you do not see a relation to Earth Systems.

Here you find some of the art most voted by the IESO students.



VOSTĚCH VYSKOČIL CZECH REPUBLIC

#1



Japan Student Name: Hanyue SUN

Earth Science Art: Art_Hanyue_SUN_JAPAN.png (Title: Forked Road) ??

Team UAE

3. SATHIVIKA MOHAN UAE SINGING

https://youtu.be/R4sneE8wK2k

4. AKSHAYASREE GANAPATHY UAE FLUTE https://youtu.be/Gzh-GFtT_NY

5. HRUDYA HANNA SHIBU UAE DANCE https://youtu.be/2IOtq3tfgWc

6. AMITA SHAJI & KRISHNA NILESH LODHIA UAE SPEECH https://youtu.be/nza70dvdES4

7. HARSHINI KALYANARAMAN UAE SPEECH

https://youtu.be/EqeCgBzkjeE

8. YATHARTH SHAH UAE PIANO

https://youtu.be/VUIH-MqmhSE

9. ANISHA SIVAKUMAR--EARTH ARTS

https://drive.google.com/file/d/1z6DVXWNDyQp4CwrSI7gE3gfCOaF0xrjv/view?usp=sharing

https://drive.google.com/file/d/1L5oSUbOpPiOUfFTVQzMgR9y6-EwqPYAH/view?usp=sharing

10. POOJITH GOPI -EARTH ARTS

https://drive.google.com/file/d/11pjvZuEkOIM8n_A7ia4sixspIE3Md3Uh/view?usp=sharing

https://drive.google.com/file/d/11wM_taPfNhcVC-Zku7mSy2O9WyBkUxKx/view?usp=sharing

.....

11. AMITA SHAJI & KRISHNA NILESH LODHIA UAE POEM

https://drive.google.com/file/d/1vgWAb_9AOs0tjsrZe-MZEkFjMyupfip-/view?usp=sharing

12. MADIHA AHAMED RIAZ -UAE TEAM POEM

https://drive.google.com/file/d/1BYBvzChG_qAJ2d01PvT7dagUJH3Pa_7O/view?usp=sharing

13. ARIT ZAKKEER UAE POEM

https://drive.google.com/file/d/1r9EF8c60s73IiwqLSFlsyLcRzYtbangW/view?usp=sharing

#14 coffee cake

Poem by SydneyBlu Garcia-Yao USA

hmm. likely,

I shouldn't have eaten that last slice

of coffee cake, but it was so very rich. stuffed, i browsed the menu, bored. no

doubt- i just had to have one. i watched the

sharpness of the whipped cream slump, melting

over the brink, like a waterfall, a sprint to the edge, a

last hurrah before it plummets. we saw them once, the falls i

mean- water so turbulent

it took its name after buttermilk. the cascade

trickled between an expanse of forest, we could hear the trees laugh in the wind, towering over us, they were kings-

or maybe gods, regal, unimaginable; there was a feeling of the

years that surrounded us; too many totally on us

fingers in generations of hands; we tried to count rings, see how many lifetimes it would take us. we stuck our

tongues out and tasted the cold mist, sweeter than soda, the

air chill like fresh mint. we promised to come

back but they're gone now, the Facebook posts assured me that only yellow do-not-enter tape welcomes visitors.

the hurricane

made sure of that. even without it, no

doubt- it would have been cut down, a craving for profit, a convoluted way of justifying destruction, a desire to take

everything that was not ours. the forest is just a

memory now, a record without a player, a waste, a pity, something to forget over wine. or maybe the trees stand like guards between us and living our lives, our last hurrah, if the planet is dying anyway, just

let us eat happily, the breeze of air conditioners

chilling us better than the forest, stuff ourselves with coffee cake, rife with cream, the only buttermilk poured from cheap

plastic.

?

i hate coffee cake.





Japan Student Name: Hanyue SUN

#16 Earth Science Art: Art_Hanyue_SUN_JAPAN.png (Title: Folked Road) look closely to see the humor!





The Earth System Pledge

We work with all our students to teach them about Earth Systems and the solar system. The pledge is a place for the students to let us, and their peers, know how they are going to use their knowledge and skills in the future. The students will be asked to submit their Earth System pledges to their mentors for approval before being submitted to the IESO Jury. Several Earth System Pledges will be selected for public recognition during the closing ceremony. The student Earth system pledge is helpful in applications for jobs and to go to university. It is not just what you know, but what you plan to do with it that is important. Will your students plan to help an issue facing their community, country or the world? Will they work on earthquake warning or mitigation? Which Earth systems spheres interest them the most? The more specific the better. A good pledge is less than 200 words long. All pledges considered worthy by the IESO Jury will be recognized as such. This can be helpful for students in their future.

Mission to Mars

International students team have been engaged in an online App game with a lot of scientific challenge and fun. Curious about this App? You could download it for free in your smart phone, just look for "My Mission to Mars".



THE NETWORK OF EDUCATORS IN EARTH SCIENCES OF ARGENTINA (REDCITIA) HAS BEEN CREATED

by José Sellés-Martínez

In mid-May 2021, a group of educators linked to the teaching of Earth sciences at different levels, met virtually with the aim of establishing the Network of Educators in Earth Sciences of Argentina (REDCITIA).

The purpose of the Network is to create a collaborative space to disseminate Earth Sciences in society and especially to contribute to consolidating its presence in Argentine education, as an essential input in the formation of responsible citizens committed to care about environmental issues. Among its purposes, the following can be highlighted: 1) Contribute to socialize and disseminate the experiences of the members of the network, as an strategy to promote similar initiatives among those who wish to update, improve and share their teaching practices; 2) Promote the realization of virtual and / or face-to-face meetings to discuss, reflect and propose strategies for training and updating in the disciplines of the field of Earth sciences and their teaching; 3) Establish cooperative links to promote research and pedagogical innovation; 4) Encourage critical analysis and contributions that can be made from Earth sciences in educational and journalistic texts; 5) Exchange experiences with national and international educational institutions, disseminate their proposes the definition of national and provincial policies aimed at strengthening the curricular presence of Earth sciences at all levels of education; 7) Establish a virtual consultation and dissemination system to promote the circulation of news; 8) Promote coordination actions between the different levels of the Argentine educational system and 9) Manage funding sources to sustain the activities that require it.

This network must expand and, therefore, educators whose professional practices contribute to the formal and informal teaching of Earth sciences and the educational research of these practices, especially related to initial, primary and secondary education and teacher training in the Argentine Republic are invited to participate. As the number of affiliates to REDCITIA increases and the need arises to create more complex forms of organization, the Network will be managed by a Provisional Coordinating Commission (CCP) made up of the founding members and will be directed by a general coordinator., democratically elected by and among the founding members. This CCP will be in charge of the tasks of disseminating the existence of REDCITIA among those potentially interested in joining it and carrying out all the necessary tasks for the fulfillment of its purposes.

- José Pablo López (UNT)

- José Sellés-Martínez (UBA)

- María Julia Solari (UNLP)

- Eliana Pereyra Fernández (UNLPam)

This first Provisional Coordinating Commission is made up of:

 Diego Arias Regalía (UBA and Grupo DidacTerra) 	
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- Marcelo Bazán (UNAHUR)
- Gabriela Castillo Elías (UNSL and UNCUYO)
- María Florencia Galecio (UNICEN)
- Héctor Lacreu (UNSL and COPLA)
- The representative logo of REDCITIA has been designed by Diego Arias Regalía and, naturally, represents the four terrestrial subsystems insofar as they are closely linked to Earth sciences, represented by the form that the tapes take.

The Israeli earth science program can look at this mirror with satisfaction and pride. The Corona pandemic as a test case for Education System - has the Israeli Earth science program passed the test? by Nir Orion

The Corona pandemic has changed the usual way of life worldwide. Many areas of life have been severely affected, and one of the most prominent is the education systems. In many countries, the ability of students to visit schools and to have direct contact with their peers and teachers has been reduced or stopped. The teaching moves to a distance teaching mode, and millions of students worldwide were put into the ZOOM squares, disconnected from any concrete interaction with the subjects of learning.

Unfortunately, for many students and teachers, the change was not so dramatic. Instead of listening to lectures and observing PowerPoint presentations as a group of passive learners in the class, they did it at home alone.

The school curricula consist of many abstract subjects, which are taught in a way that causes many students to fail to understand the relevance of these areas to their daily lives. Earth science education has a considerable advantage in teaching abstract concepts by a teaching sequence that gradually moves from the concrete to the abstract.

The Israeli Earth science program follows the earth system approach, inquiry-based learning in outdoor and indoor learning environments. The program is based on 100 inquiry-based handson activities and about ten one-day field trips. Therefore, the closure of schools, which prevented any face-to-face interactions and moved students and teachers to the virtual environment, challenged our ability to implement our educational philosophy.

The dissonance between the pandemic school reality and our educational philosophy and practice did not allow us to enter our students into black squares of the ZOOM.

Our solution to this situation was to transfer responsibility for the learning process to children and

their parents. We have prepared an **inquiry-based self-learning kit** for each student. This kit included materials and lab equipment for conducting inquiry-based learning at home (figure 1).

The students worked at home with worksheets precisely as they would work in the school's lab. The teachers supported and mediated the learning process through distance learning platforms (CLASSROOM, ZOOM) and the WhatsApp platform.

However, our program includes activities that cannot be conducted independently at home. Some result from safety issues such as using of flames and hot plates and some that deserve lab equipment, which we could not provide each student (like microscopes).

Figure 1: Kits for independent home learning

Moreover, the outdoor is a central learning environment of the Israeli earth systems program. For example, the Rocks Cycle and the earth Systems unit includes four one-



day field trips and one 2-days field camp. Each field trip is in a specific stage within the spiral

teaching sequence. However, while closing the schools, teachers were not allowed to take their students outdoors.

To solve both the above constraints, we contacted the parents of each class. We explained to them that teachers are not allowed to have face-to-face interactions with the students.

Still, suppose the parents take responsibility for the lab activities that deserve face-to-face interaction and field trips.

Figure 2: Lab activity in an open space backyard

We told them in that case, we will provide the resources and guidance that will enable us to conduct those activities.

Our solution for the complicated lab activities was to work with small groups of students at the backyards of their homes. Following the parents' invitation, we came to these open spaces with the lab materials and equipment and assisted in active learning (fig. 2, 3).

We could do it, of course, only during the periods when the schools were closed, but small groups could gather in open space.





Figure 3: Lab activity in an open space backyard

Our solution for the outdoor activities was that the parents would bring their students to the field sites. Since our field trips are based on direct interaction with the phenomena with the guidance of worksheets and not interact with oral lecturing of a teacher, we provided the students with the worksheets and signed the exact location of the sites in the field.

We encouraged the parents to coordinate with us when we can stay in the field and help the students or go out alone and contact us continuously via the video on WhatsApp (fig, 4).

Figure4: A parent and students during field work The parents' response was surprising in terms of the amount of support and cooperation we received. The following are some characteristic quotes from the parents' responses: "During all this dark period, you are the only ones who really care about our kids and took them out of the boring, depressing screens.



extreme during the Corona period.

"I am so grateful. It was the only meaningful learning experience that my daughter experienced this year". "How come you are the only ones who could think and operate out of the box?", "I am grateful since it was a great family learning experience. It was the first time

that I had the chance to study together with my son". "I envy my child that he gets to learn your program. I wish I had learned that way

when I was in school". Earth science, like any other field of study

in school, is not a goal. But only a means. Unfortunately, the Essential School is saturated with subjects taught in a boring way that focuses on a teacher who transmits information and a student who emits the same information ...and forgets it. This situation, which has characterized the essentialist schools for about 200 years, has been sharpened and brought to an

The Corona Pandemic has placed a mirror on the nature of the essentialist school system and has served as a touchstone between educators and information providers.