



# International GeoScience Education Organisation

April 2023 Newsletter

<http://www.igeosced.org/>

## 2018 – 2022 IGEO Executive Committee

Chair	Nir Orion	Israel	<a href="mailto:Nir.orion@weizmann.ac.il">Nir.orion@weizmann.ac.il</a>
Past Chair	Roberto Greco	Brazil	<a href="mailto:greco@unicamp.br">greco@unicamp.br</a>
Vice-Chair	Sharon Locke	USA	<a href="mailto:slocke@siue.edu">slocke@siue.edu</a>
Secretary	Tiago Ribeiro	Portugal	<a href="mailto:slocke@siue.edu">slocke@siue.edu</a>
Treasurer	Rosely Imberon	Brazil	<a href="mailto:imbernon@usp.br">imbernon@usp.br</a>
Web Manager	Takashi Sawaguchi	Japan	<a href="mailto:tsawa@toyo.jp">tsawa@toyo.jp</a>
Newsletter Editor	Michael Passow	USA	<a href="mailto:michael@earth2class.org">michael@earth2class.org</a>

Special Advisor: Tanja Reinhardt

Special Advisor: Shankar Rajasekhariah, India

Next convention coordinator: TBA

**Council Members:** <http://www.igeosced.org/about-the-igeo/officers/>

### In this Issue:

- p. 2 From the Desk of the Chair
- p. 4 International Earth Science Olympias (IESO) 2023
- p. 9 Report about Activities Associated with the “Chris King” Award
- p. 10 The American Geophysical Union Fall Meeting Bright STaRS poster session
- p. 13 What Do We Know about Learning and Teaching Geosciences?
- p. 14 Earth2Class: An Effective and Easily Duplicable Model for Providing a Broad Impact of Cutting-Edge Science, Teacher Professional Development, and Inspiration for High School Students
- p. 15 About the Lamont-Doherty Earth Observatory (LDEO)
- p. 18 Learning geology in the field: EarthCaching for teacher training and geoawareness



Dear IGEO members,

I am pleased to share our progress in stabilizing and institutionalizing IGEO as a sustainable organization. At this stage, we are still working on establishing a sustainable infrastructure at the organizational level and our ability to influence ESE quality worldwide.

At the organizational level, we are in the process of **registering IGEO as an NGO**. It will allow IGEO to own a permanent Bank account, which will not have to move to another country whenever a new treasurer is elected. Establishing IGEO as an NGO will enable a proper financial procedure supervised by an accountant.

As I already mentioned and will repeatedly mention, IGEO is not a goal. It is only a tool to promote qualitative Earth Science Education in schools worldwide.

The disturbing truth is the low profile of ESE in schools worldwide. The destiny of IGEO is to elevate the low profile of ESE, firstly at the qualitative level. Only qualitative ES teaching and learning will influence its quantity.

To influence the quality of ESE in schools, we launched the **Growth of Leadership in Earth Science Education (GLESE) flagship project**. The GLESE program aims to grow leaders who will advance ESE nationally and internationally. Ten participants were selected for the GLESE 1-year pilot hybrid program, and the first online meeting occurred on April 15.

ESE is a profession, and our ability to influence educational systems worldwide depends on the amount and distribution of Earth science education professionals. We expect the GLESE program to provide the participants with the professional tools to change the ESE status in their countries.



To expand the ESE professional community worldwide we introduced a **new IGEO membership registration form**. Please share the link of the registration form with many yours Earth Science educators' colleagues.  
link: <https://forms.gle/LKwGnAfr6JwgT42u6>

We activate **three Social Media sites** to encourage communication among the IGEO community, present our educational initiatives, and attract new members. Please follow the following sites and share them with your colleagues.

- **Facebook:** <https://bit.ly/3Xn5XsU>
- **Twitter:** [@igeoscienced](https://twitter.com/igeoscienced)
- **Instagram:** [@igeoscienced](https://www.instagram.com/igeoscienced)

**Students study Earth Science (ES) – A Visual Perspective:** We would like to receive photographs of a learning interaction of ES students with field and laboratory phenomena to publish on IGEO Facebook.

The photo should include the following characteristics:

- 1) It should capture a learning interaction between the students and the Earth Science phenomenon being studied. It should not capture passive participation or modeling; it should not be a group photo with the phenomenon serving as a background.
- 2) The explored phenomena should be clear and explained in a short text.

*The following is an example of what we would like to receive:*

*Students explore a well-cemented conglomerate of angular chert and sub-rounded limestone. They work with a worksheet that directs them to identify what type of a rock the pebbles are made up of. And to explore the size, roundness, and classification of the grains. Following their observations, they have to conclude about (a) which rocks were exposed to the surface when the conglomerate formed, and (b) the transport distance and flow velocity of the river that deposited the pebbles.*

*Site: Eilat area, Israel*

*Photographer: Moshe Rivan, ES teacher*



**Please send your suggestions to**

[nir.orion@weizmann.ac.il](mailto:nir.orion@weizmann.ac.il) or [tiago.az.ribeiro@outlook.com](mailto:tiago.az.ribeiro@outlook.com)>

We established several committees (Fundraising, Journal, IESO, Ethics, and Financial audit) to encourage the active involvement of IGEO members in promoting ESE.

Since no country volunteered to host IESO23, the **IESO Steering Committee volunteered to organize IESO23 online. The Journal and the fundraising committees** have started to work, and hopefully, we will see the outcomes of their activity soon.

We had the first Council online meeting for 2023 in January. The second meeting will be on June 30, and we hope to see and hear more active Councilors.

**Yours,  
Nir**

**15.04.2023**

[nir.orion@weizmann.ac.il](mailto:nir.orion@weizmann.ac.il)

**972-545223614**

## INTERNATIONAL EARTH SCIENCE OLYMPIAD – 2023

August 20 – 26, 2023

<https://scholarshiparena.in/international-earth-science-olympiad-ieso/>

The **International Earth Science Olympiad (IESO)** has been announced by the Geological Society of India (GSI). The International Science Olympiad was founded as one of the major activities of the international Geoscience Education Organization. It is an annual competition for secondary school students, not the main aim of IES to encourage students in class and public awareness of Earth science and to enhance Earth science learning and teaching/learning at the school level. The students who are willing to apply, need to apply form through the school/center in which they wish to take the exam. In this article, we also provide you with information related to the **International Earth Science Olympiad IESO 2023**.



The **International Earth Science Olympiad** aims to encourage students' interest and public awareness of Earth science and enhance Earth science learning and enhance teaching at the school level. The IESO aims further to foster friendly relationships among young learners from different countries and promote international cooperation in exchanging ideas and materials on Earth science and Earth science education.

## **Exam Pattern for International Earth Science Olympiad**

- Mode of examination: Offline
- Types of Questions: Objective type
- Duration of the examination: 1 hour and 30 minutes
- Language of Questions: English

## **Syllabus for International Earth Science Olympiad**

### **Geosphere**

- Mineral and rocks
  - Identification of selected minerals from the list
  - Classification of selected rocks from the list
  - Identification of reefal limestones and reef-building organisms.
- Historical geology (Sedimentology, paleontology, stratigraphy, paleo-global change)
- Principle of plate tectonics and its application.
- Plate tectonics and seismology
- Physical geography- geomorphology, climatology, hydrology, soil geography, major vegetation zones.

### **Astronomy**

- Observational astronomy- relative motion between the sun, moon, and Earth, sky, planetary observations, satellite brightness, and color telescopes.
- Introduction to the solar system- Sun Direct planets, outer planets, dwarf planets, comets, asteroids, satellites, planetary rings, space exploration in the solar system.
- The sun is a star
- The earth in the universe
- Space science
- 

### **Atmosphere**

- Basics and energy of the atmosphere
- Moisture, clouds, and precipitation
- Air pressure and motion



- Weather systems and pattern
- Climate and climate change
- Observations, weather forecast, and atmospheric optics

Dear Colleagues

I hope that preparations are afoot to select the best students for your national team for IESO 2023. All the best! While you are making those preparations, the Steering Committee (SC) for IESO 2023 too has been busy discussing organizational issues. Based on the meetings held by the SC so far, I wish to bring to your notice the following information that may help you plan your national team's participation.

#### **DATE AND SCHEDULE:**

The 16<sup>th</sup> edition of the International Earth Science Olympiad (IESO) will be organized **online** by the International Geoscience Education Organization during **August 20-26, 2023**. The schedule of the event is:

	<b>DAY 1</b>	<b>DAY 2</b>	<b>DAY 3</b>	<b>DAY 4</b>	<b>DAY 5</b>	<b>DAY 6</b>	<b>DAY 7</b>
<b>AM</b>	OPENING CEREMONY	ESP Preparation	ESP Presentation	DMT	NTFI presentation	NTFI presentation	CLOSING CEREMONY
<b>PM</b>	ESP Preparation	ESP Presentation	DMT	DMT	NTFI presentation	IESO Pledge Art in Earth Sciences	

#### **ACTIVITIES & CO-ORDINATORS:**

We will be organizing the following **activities** during IESO 2023:

**National Field Team Investigation (NTFI):** Nir Orion (nir.orion@weizmann.ac.il)

**Earth System Project (ESP):** Rajasekhariah Shankar (rshankargeo@gmail.com)

**Data Mining Test (DMT):** Bing Shen (bingshen@pku.edu.cn)

**Art in Earth Sciences (AES):** Greg McNamara (greg.mcnamara@asi.edu.au)

**IESO Pledge:** Susanna Occhipinti (susocchip@gmail.com)

Mentors and participating students may directly contact the coordinators for any clarifications on the activities.

#### **NATIONAL TEAMS:**

A national team may consist of a maximum of:

4 Students

2 Mentors

2 Observers, and

6 Guest students (Not eligible for medals or awards).

There may be restrictions on the number of students from a national team that can take part in each activity. This will be notified in the write-ups on the activities.

**REGISTRATION FEE:**

Registration fee will be 1000 Euros per country. Third World and other countries that are unable to find enough financial resources can make a request for fee waiver to Nir Orion ([nir.orion@weizmann.ac.il](mailto:nir.orion@weizmann.ac.il)).

We will begin the registration process soon.

**OTHER RULES AND REGULATIONS:**

Other rules and regulations for the event will be as per IESO statutes (<http://www.igeoscienced.org/activities/ieso-2/>).

Rajasekhariah Shankar

Co-ordinator

International Earth Science Olympiad

## REPORT ABOUT THE ACTIVITIES ASSOCIATED WITH THE “CHRIS KING AWARD”

José Sellés-Martínez

Argentina

The first activity of the program related to the “Chris King Award” project (which was selected by IGEO officers last year and assigned a budget of 1.000 Euros) was performed on 22 October, 2022. The second issue of the program will take place in coincidence with the *Day of the Earth*, in forthcoming Saturday 22 in April.

“TEACHING EARTH SCIENCES IN CONTEXT” was the name of the activity which took the whole day (from 9:00 in the morning to 5:00 in the afternoon) and was attended by 15 teachers coming from different schools in the area. The workshop was completely free and so were the coffee breaks. The participants only had to pay for their lunch, which could be freely chosen, but was taken in group in the gardens of the facilities where the workshop was offered in order to promote interaction among participants. The activities had been guided by Marcelo Bazán, Silvia Carrasquero, María Julia Solari and José Sellés-Martínez, who share a great experience in teaching and teachers training in the area of Earth Sciences.

The workshop covered the following subjects:

### THE PERIODIC TABLE AS A STARTING POINT

The activities began with the analysis of a large quantity of absolutely varied objects displayed on a table. There were minerals, rocks and fossils, but also manufactured objects of mineral, animal and vegetable origin. The idea was to discuss grouping and classification criteria and establish a series of “sets” of objects that shared common features. After this activity, the first Power Point “**The Geology of the Periodic Table**” was presented. It addressed: *Basic definitions. The Periodic Table. Organization criteria. Relative abundance of the different elements. Chemical elements and their relationship with minerals. Processes that lead to the formation of minerals from chemical elements. Native elements that constitute minerals.*

### DETECTIVES WORKING ON NATURE

This part began with a revision of the criteria used to classify the collection of objects and discuss which of them were made of a single substance and which recognized complex manufacturing processes. The second Power Point “**Identikits to recognize minerals and rocks**”, dedicated to *Definition of “mineral”. Main features and characteristics. Chemical classification. Physical properties that guide its identification*, was then presented and, immediately afterwards, a discussion and revision of the previous classification took place.

### ROCKS SURROUND US...



The sets of samples were reviewed again in order to discuss the reasons why certain objects have been classified as rocks and which could be the most useful criteria to organize these rocks into sets that share common features. Once consensus had been reached the projection of the third Power Point, "**Minerals and rocks in everyday life**", started. It referred about natural resources of geological origin, their extraction, industrialization and use in urban environments.

Each of the participants received a free copy of the book "**Minerals and Rocks in Art, Science and Technology**", written by Sellés Martínez and Castro and all of them make us know that they were greatly satisfied with the journey, kindly acknowledged the professors... and asked for more.

So, in order to satisfy their interest, a second workshop devoted to "**THE STORY OF THE HISTORY OF THE EARTH**" is planned to be offered during Day of the Earth in next April. It will cover the following aspects:

- a. Shape and dimensions of the planet Earth, the first unknowns to be solved
- b. Surveying the Earth's Interior. How to investigate the inaccessible
- c. The definition of a new paradigm. How the Global Tectonics Paradigm was constructed
- d. The evolution of the Earth System. Geology as the record of all Earth Subsystems.

We think the subject is quite interesting and hope it will be enjoyed by participants.



The participants and part of the materials (on the right of the image) at the facilities of an old lime factory where the workshop was performed.

## **The American Geophysical Union Fall Meeting Bright STaRS poster session**

The AGU Fall Meeting is the largest conference gathering of Earth and space scientists. For over 20 years, the Education section of AGU has sponsored a middle school and high school poster session called Bright STaRS. This **Bright Students Training as Research Scientists**.

This is an outstanding and unique opportunity for students to present their research at an international conference. The range of topics include space science, ecology, biogeosciences, environmental justice, and climate change solutions to name a few. The session is well attended by other members of AGU, providing inspiration and informative feedback.

### **This Bright STaRS poster session abstract (for your information):**

High and middle school students are producing quality Earth, space and ocean scientific research in summer, in-school, and after-school programs. These students are readily exposed to Science, Technology, Engineering, and Math (STEM) practices and are often encouraged and involved with adults and/or scientists to investigate Earth, space and ocean attributes including testing variables and monitoring the environment. The goal of this poster session is to give grade 6-12 students a platform to communicate their research to scientists, educators and peers in order to gain best practice research and presentation skills. The science should be presented through art or poster format by students themselves. Grade 6-12 students throughout the world are encouraged to connect with conveners to submit their projects well in advance of the abstract deadline. The lead author on the abstract must be a Grade 6-12 student. This session is sponsored by the AGU Education section.

The AGU Fall Meeting 2022 was held virtually and in person in Chicago, USA. There were over 250 students involved in AGU this year, many of them working collaboratively across the USA through the NASA SEES program. There were a total of 135 posters, and approximately 70 of them were presented in person during a poster session On Thursday morning. All other students presented virtually throughout the day.

Students are from all over the USA and internationally there were students from the Japan, India and 35 students from Hong Kong.

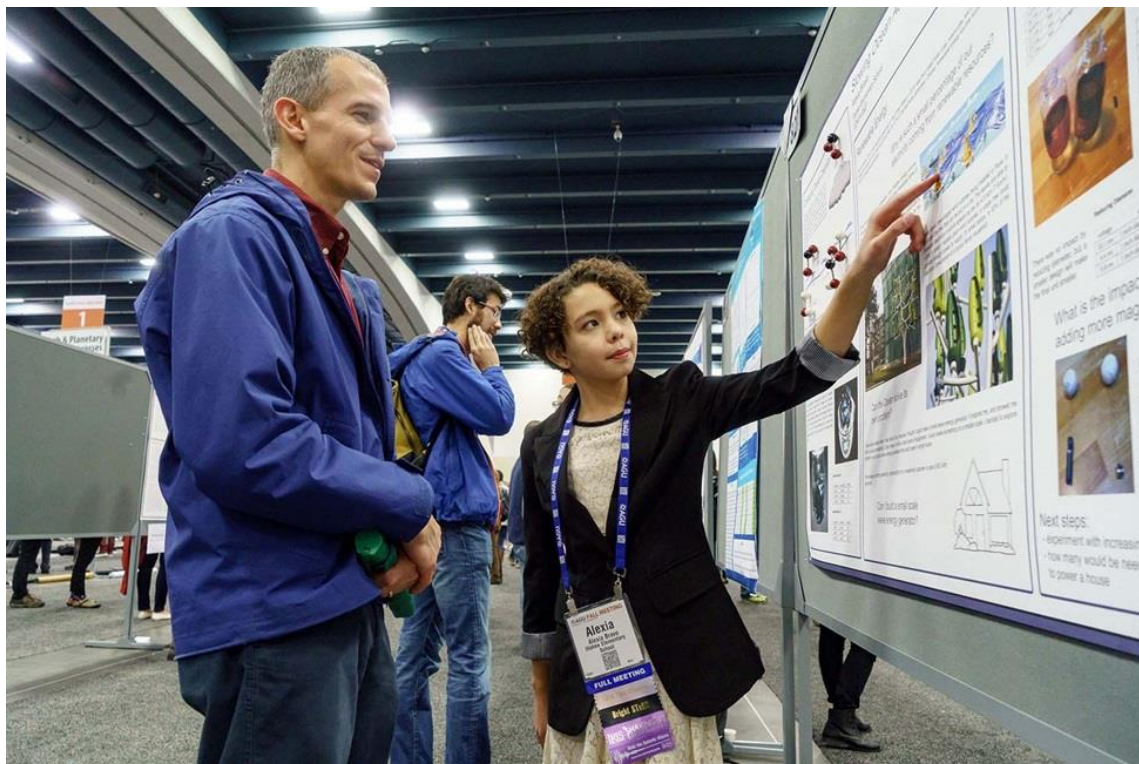
After the poster session, there is luncheon hosted by the AGU organization for all students and their supervisors/chaperones.

More information is available at:

<https://eos.org/features/students-learn-new-skills-with-scientist-in-training-programs>



*Images from prior Bright Stars poster sessions*



There will be a session on geoscience education research during the annual conference of the **German Geological Society in September 2023 in Berlin (GeoBerlin 2023)**. The call for abstracts is open. The conference language is English and we are looking forward to many contributions from all over the world.

### **What do we Know About Learning and Teaching Geosciences?**

Felzmann, Dirk (2); Hlawatsch, Sylke (1), 1: Richard Hallmann Schule, Germany; 2: Universität Koblenz - Landau, Natur- und Umweltwissenschaften

Keynote speaker: Prof Nir Orion, Department of Science Teaching, The Weizmann Institute of Science, Israel

Keynote: Earth Systems Education

Schools should enable young people to make informed decisions regarding sustainable development of planet Earth. However, German geoscientists and geoscience institutions have repeatedly expressed their concern about the lack of basic geoscience knowledge among the general public and the limited geoscience school education. This is disturbing, because an in-depth understanding about the functioning of the Earth as a system, e.g. the development of natural resources or the climate is an essential prerequisite. Research into teaching and learning has shown that problem solving is not possible without knowledge of the subject matter (Weinert, 2014).

Invited are researchers that have been involved in geoscience school education and teacher training, also as part of geography, biology, chemistry, physics education to present and discuss their findings. With this session we aim to illustrate the field of geoscience education research ("fachdidaktische Forschung" in German). We are looking forward to learn, for example, about prerequisites of the learners and teachers (e.g. their interests, their conceptions, their competencies), the effects of geoscientific learning environments on the cognitive, social, motivational development of the learners, the analysis of alternative teaching concepts or assessments on the situation of geoscience education in various nations.

References: Weinert, F. E. (Ed.). (2014). Leistungsmessungen in Schulen (3. Aufl.). Beltz

More information: <https://www.geoberlin2023.de/>

Call for abstracts: <https://www.geoberlin2023.de/call-for-abstracts.html>

# **Earth2Class: An Effective and Easily Duplicable Model for Providing a Broad Impact of Cutting-Edge Science, Teacher Professional Development, and Inspiration for High School Students**

**By Dr. Michael J. Passow**

## Earth2Class: A Brief History

The seeds of the “Earth2Class” pilot program were planted in 1998 when Dr. Michael J. Passow, a national leader in the field of Earth Science Education and Teacher Enhancement, created a weekend workshop series bringing together Lamont-Doherty Earth Observatory of Columbia University (LDEO) scientists and classroom teachers. For two years, these “Saturday Workshops for Teachers” allowed teachers to hear about the excitement of scientific investigations and obtain teacher-training materials developed by the American Meteorological Society Education Program.

In 2000, cooperation between LDEO and the Institute for Learning Technologies of Teachers College, Columbia University produced a pilot technology-infused distance learning extension of these “Earth Science Saturdays for Educators.” Through the partnership with ILT’s Professional Development Associate Director, Kelly Corder, ILT’s Professional Development Manager and Instructional Designer, Cristiana Assumpção, and ILT’s IT Manager, Frederico Baggio, the transition to a distance-learning “web-cast” model (“Earth2Class”) enabled teachers in the North Hudson Electronic Educational Empowerment Project Consortium to become “virtual participants” in workshops taking place on the LDEO campus, even though they are physically located approximately 200 miles north of LDEO. Although these ILT teleconferences ceased when the NHEEEP grant ended, workshops continued on the LDEO campus.

“Earth2Class” involves a collaboration of the [E2C Team](#) (Passow, Assumpção, and Baggio), LDEO researchers, and teachers and students from the New York metropolitan area and elsewhere. Each workshop includes an introduction to the theme created by Passow, followed by presentations by the Lamont research scientist(s) about their cutting-edge investigation research. After “lunch with a scientist,” participants spend the afternoon exploring how the science research could be incorporated into classroom-ready curriculum lessons and units that align with state and national Science Education Standards. The involvement of the Lamont scientists is a key feature of this program. Their availability exposes teachers to cutting-edge research.

The scientists also help the teachers develop K-12 curriculum linked directly to “real world questions.” Drawing on the scientists’ expertise, teachers can show students how the science they are learning applies in the “real world,” as well as other aspects of the curriculum. Students who attend have the unusual opportunity to interact with ‘real’ scientists, something not always possible in most science courses. These discussions have been strongly influential, sometimes leading to college and careers decisions that might not otherwise have happened.

Midway through the 2022 – 2023 series, E2C has presented 225 Workshops featuring about 100 LDEO scientists to more than 400 attendees. Many thousands more teachers and students have used the online resources, which have averaged about 75,000 hits per month.

In January 2004, the National Science Foundation awarded a two-year grant to Dr. Gerardo Iturrino and Michael Passow to conduct a “proof-of-concept” study of E2C, seeking to identify which aspects of the program can serve as effective models for similar programs at other institutions. This support allowed for enhanced monthly workshops, and teacher conferences in the summers of 2004 and 2005. The E2C program received formal evaluation in conjunction with the NSF grant by Dr. Pearl Solomon and Dr. James Ebert. Informal evaluations have been provided by workshop participants, and through presentations at national and international conferences sponsored by the AGU, AMS, EGU, GSA, NAGT, NSTA, and other organizations. Examples of the abstracts from these are included below.

In March 2014, with tremendous sorrow, we noted the sudden passing of Gerry Iturrino. Gerry’s participation in e2c provided the program with scientific reliability and validity not otherwise possible.

For both workshop participants and others who cannot attend in person, this “Earth2Class” website has become a valuable resource. Like the workshops, the website has been created through the combined efforts of the E2C Team, LDEO scientists, workshop attendees, and dozens of other teachers who have attended the summer conferences or provided online resources. The website includes archived versions of the workshop; resources for middle and high school Earth Science teachers and students; suggestions for incorporating educational technology into the classroom; links to science education and professional societies; and many other useful materials. During past years, the website has averaged around 5,000 hits per month.

Participants receive a certificate of attendance at each workshop that has been accepted for District professional development credits. Arrangements have allowed those interested to earn graduate credits through Teachers College and St. Thomas Aquinas College. E2C has helped link teachers with numerous other opportunities, including American Meteorological Society’s DataStreme courses, LDEO Research Experiences for Students and Teachers, “teachers-at-sea” and similar travel programs.

Cristiana Assumpção and Frederico Baggio returned to their home in São Paulo, Brasil, after Teachers College awarded Cristiana’s Ed.D. for her analysis of the impact of E2C. Since then, the E2C Team continues to work closely through electronic telecommunications and visits between their homes. In 2007, the E2C program began a new chapter by establishing connections with scientists and educators in Brazil. Beginning in 2017, E2C established an expanded working relationship in Brazil through Prof. Douglas Sathler of UFVJM in Diamantina, Minas Gerais, Brazil.

With the onset of the COVID-19 pandemic, E2C switched from ‘live’ on-campus programs to virtual, zoom presentations.



This has enabled many people who cannot come physically to the Lamont campus to participate in the presentations and gain knowledge of cutting-edge research. Many of these zoom programs have been recorded and available for viewing at <https://www.youtube.com/channel/UCadTrEtrumYSGOEcfMB4h-w>. One of the only barriers now is the time difference between Eastern time zone and the home time zone of viewers.

The schedule of programs in each academic year (Sep – May) is available at <https://earth2class.org/site/>. Participation is free to all. Anyone interested in participation in a zoom program should send an email to me at [michael@earth2class.org](mailto:michael@earth2class.org) at least one week before the program.

### **About the Lamont-Doherty Earth Observatory (LDEO)**

The Lamont-Doherty Earth Observatory seeks fundamental knowledge about the origin, evolution, and future of the natural world.

Our scientists study the planet from its deepest interior to the outer reaches of its atmosphere, on every continent and in every ocean, providing a rational basis for the difficult choices facing humanity.

#### **History of Lamont**

The Lamont-Doherty Earth Observatory sits on a high, forested bluff on the Palisades overlooking the Hudson River, about fifteen miles north of Manhattan.

The Lamont Geological Observatory, now the Lamont-Doherty Earth Observatory, was established in 1949. Its first director was Professor William Maurice “Doc” Ewing, a pioneering Earth scientist.

#### **The Lamont Family**

In 1929, Thomas W. Lamont (1870-1948), a Wall Street banker, constructed a weekend residence

overlooking the Hudson River in Palisades, New York. He named the estate “Torrey Cliff” after John Torrey, a prominent botanist who had spent summers on the site from about 1854 to 1865.

In 1948, Thomas W. Lamont died and his widow, Florence Corliss Lamont (1873-1952), an alumna of Columbia University, donated the estate to Columbia. She wrote, in part, “I am giving the property in my husband’s memory. My gift is unrestricted,” but she was pleased with the University’s plans to make the property a center of geological research, and assured that “the world [would] benefit.”

Edward Miner (“Ned”) Lamont is the current governor of Connecticut is the great-grandson of Thomas Lamont.



## Lamont Becomes Lamont-Doherty

In 1969, the Observatory was renamed “Lamont-Doherty” after a major contribution from the Henry L. and Grace Doherty Charitable Foundation. Henry Latham Doherty (1870-1939) was the founder of the Cities Service (Citgo) Company. The Henry L. and Grace Doherty Charitable Foundation is a major supporter of oceanographic institutions.

## The Geological Observatory Becomes the Earth Observatory

In 1993, the Lamont-Doherty Geological Observatory was renamed the Lamont-Doherty Earth Observatory in recognition of its growing scope of expertise and influence in the Earth sciences.

Lamont-Doherty is home to the greatest breadth of Earth science research and largest concentration of Earth scientists of any academic institution in the nation, and forms the core of Columbia University’s world-leadership in climate change research and adaptation.

Lamont scientists seek to understand Earth’s future by analyzing the past history of climate change recorded in ice cores, tree rings, glaciers, corals, land and ocean sediments, and other natural archives.

Lamont is home to pioneers in the use of technology, including underwater vehicles, aircraft, drones, and satellites, and operates the *Marcus G. Langseth*, an oceanographic research ship able to collect critical measurements, samples, and real time data world-wide.

This unique range and depth of scientific investigation sets Columbia University’s climate response capacities apart. Today, with the growing body of evidence and information about the impact of climate change on myriad aspects of life on Earth, Lamont’s contribution to creating global solutions has never been more crucial or more exciting.

With the wealth of accumulated data collected through more than 70 years of scientific endeavors, Lamont-Doherty has amassed some of the world’s most comprehensive and accessible databases in seismology and marine geosciences. The Observatory houses one of the world’s largest collections of deep-sea and ocean-sediment cores—more than 19,000, from every ocean and sea, and many rivers.

Tools used by Lamont-Doherty petrologists and geochemists include high pressure and temperature experiment apparatus, and facilities allowing analysis of virtually all elements and isotopes in rocks and water, including mass spectrometers, plasma and solid-source spectrometers, electron microprobes, scanning electron microscopes, and x-ray diffraction. Lamont’s polar physics division designed and built IcePod, which focuses on the development of an integrated ice imaging system that can measure in detail both the ice surface and the ice bed.

The Observatory has fully equipped laboratories for rock mechanics, paleomagnetism, and tree-ring analysis, as well as its own electronics shop and instrument laboratory. To analyze and interpret the massive influx of data, a powerful computer facility and network link facilities on campus and in the field.

Observatory scientists continue to uphold Lamont’s signature ethos—ingenuity, visionary imagination, and indomitable drive to discover and to inform solutions to society’s most profound challenges.

#### Director’s Office

Dr. Maureen E. Raymo—world-renowned marine geologist and climate scientist—is a co-founding dean of the Columbia Climate School, director of the Lamont-Doherty Earth Observatory, and G. Unger Vetlesen Professor of Earth and Environmental Sciences.

#### Academic Affairs & Diversity

Diversity, equity, and inclusion are integral to academic and scientific excellence, and we are committed to fostering a diverse, vibrant, and inclusive work environment.

#### Anti-Racism Commitment

A renewed and effective dedication to anti-racist practices is imperative to the operation of a just institution and our ability to undertake the most creative, innovative, salient, and beneficial research.

#### Alumni

Our Alumni Association is dedicated to advocating for the welfare of Lamont and creating networking opportunities for students and alumni.

#### Awards

In addition to administering The Vetlesen Prize—the Nobel Prize of the Earth sciences—and recognizing Lamonters with our own awards, we are immensely proud of the recognition our researchers receive through an array of prestigious external awards.

#### Luminaries; Signature Events

From luminaries like Marie Tharp, Wally Broecker, and Walter Pitman to signature events like Earth Day, Open House, and Plate Tectonics Symposium, we celebrate our pioneers and showcase our science.

More information and additional details about programs: <https://lamont.columbia.edu/>

#### **Learning geology in the field: EarthCaching for teacher training and geoawareness**

Sharon Locke, IGEO Vice-Chair

Field-based learning is recognized as central to the training of geoscientists. Despite this, field-based learning is not prevalent in K-12 teacher training. For geoscience education to thrive, more opportunities are needed for future teachers to see real-world geology in action.

EarthCaches™ are one potential way to integrate field learning into teacher training and to raise public awareness of the geosciences.

Developed by the Geological Society of America under the leadership of IGEO member Gary Lewis, an EarthCache™ is a kind of treasure hunt where participants navigate to the coordinates of a geologic site of interest using a mobile phone or hand-held. They then answer several questions about the geological phenomenon they are observing and do a short activity, such as taking a measurement. EarthCaches™ and their questions can be found on the Geocaching website, [www.geocaching.com](http://www.geocaching.com). This activity reaches millions of people and can help teachers and members of the public learn about nearby geologic sites they may never have visited. By raising geoawareness, this activity can also help local geoheritage and geoconservation efforts.

Unfortunately, EarthCache™ site locations are skewed towards economically developed regions. This means that the geoscience education community is missing an opportunity to better inform the public of geologic treasures in their own communities. As someone who has studied EarthCaching for several years, I am interested in hearing from other IGEO members about their awareness of and use of

EarthCaches in formal or nonformal education, especially in emerging/developing economies. If you have information to share or would like to learn more, please fill out this brief survey at <https://forms.gle/1dFZZowsG9rxXid79>.