"Exploring the Sea Floor"
Introduction

For 2025 we return to Vienna for our 23rd GIFT workshop 'Exploring the Sea Floor' - in the middle of UNESCO's Ocean Decade.
The Sea Floor (a.k.a. the seabed, ocean floor & ocean bottom) is a complex and intriguing landscape, subject to many of the geological processes we experience on land. While its landscape continues to change, it is worth remembering that as of May 2023, 75% of the world's sea floor was yet to be mapped, in part because of its inaccessible and challenging nature (remember the lowest point in the ocean is much deeper than the highest point on land).
Although out of sight for so long, the sea floor has the same general characteristics of the continental land with mountains, plains, channels, canyons, ridges, exposed rocks and sediment covered areas. The sea floor allows scientists to draw connections between volcanic, tectonic, hydrothermal, and biological systems in order to better understand the Earth's remarkable, evolving geography. Leading experts in many of these topics will join us at GIFT and share their knowledge with us across an exciting 2.5 days.
We will kick-off on Monday morning looking back at the history of seafloor explorations in the hands of Angelo Camerlenghi from OGS Trieste, Italy. Continuing our retrospective view, Jason P. Morgan will join us and highlight some aspects of the Expedition of 'F.A.M.O.U.S' (French American Midocean Undersea Study) that took place over 50 years ago and gave us the first glimpses of the deep ocean floor.
Without leaving our seats in Vienna, we will head to MARUM, an internationally recognised centre for marine research anchored at the University of Bremen where Ulrike Prange and colleagues will show us some of the inner workings of the Bremen Core Repository. Here, more than 192 km of cores from the Atlantic, Arctic Ocean, Baltic Sea, Mediterranean and Black Sea are stored.
Those cores are extracted at sea as part of ocean drilling investigations by IODP and others. Sharon Katz Cooper from the Lamont Doherty Earth Observatory in Columbia University, USA will update us on how teachers continue to engage with the IODP Schools of Rock which are educational workshops enabling teachers to become familiar with the International Ocean Discovery Program (IODP), scientific drilling and earth science through interactions with IODP scientists and Education/Outreach Officers.
Our final lecture of the Monday will be given by Rouwen Lehné and focus upon what we can learn from sea floor studies past and present around Iceland.

Day 2 begins with a focus upon hydrothermal vents. These 'hot springs' form on the ocean floor at locations where seawater meets magma. They have rich and diverse chemistries and are home to unusual organisms, often seen nowhere else on our planet. Valérie Chavagnac will speak first (via Zoom) about the geological aspects, before Daphne Cuvelier focusses our attention upon the unusual biodiversity of these vents.
After an interlude for more practical ideas we shall discover what can be revealed about of our understanding of the mid-ocean ridge system when it makes a rare appearance above ground, with Georges Ceuleneer from CNRS in Toulouse taking us to Oman in the Middle East. It is then the turn of Jean-Marc Lardeaux from the University Cote d'Azur to take us higher and explore orogenesis (the process of mountain building that occurs when two tectonic plates collide).

Our final day focuses a little more on tectonics beginning with a look at subduction zones in the company of João C. Duarte from the University of Lisbon in Portugal. We will then welcome a second online presentation, with Cannat Mathilde joining us from the Institut de Physique du Globe de Paris to discuss the formation of oceanic crust and the tectonic and magmatic diversity of mid-ocean ridges.
GIFT 2025 will close with two presentations focussed upon different aspects of minerology of the sea floor. Sabina Palinkas will bring us insights from the Arctic Ocean and discuss sulfide mineralization along ultraslow spreading ridges before Clifford Patten closes our workshop with a reminder of what is buried below the sea floor; a buried treasure perhaps!
Following a tradition in the GIFT workshops, the presentations will be intermixed with practical hands-on activities and sharing of online tools and resources ably demonstrated by András Zlinszky, Faustine Gendron, members of the EC and our team of Geosciences Education Field Officers (GEFO).
And, of course, we will have presentations of 47 posters by those of you who wish to present to a wider group under the theme '*Discovering the oceans and sea floor in class.*' This poster session is a great Networking and sharing opportunity and its likely we will be joined by various scientists, participating at the General Assembly, who have an interest in education.
As every year, and prior to the workshop, GIFT participants are most welcome to a guided tour of the Vienna Museum of Natural History this year given by Mathias Harzhauser, Oleg Mandic and Anna Weinmann beginning at 16:00 hrs on Sunday afternoon (at the NHM).
And at the end of the GIFT 2025 workshop, do not forget to fill out the evaluation form. The success and direction of future workshops also depends on you and your valued feedback.

Sunday, 27 April 2025

16:00-18:00 GUIDED TOUR
OF THE NATURAL HISTORY MUSEUM
Welcome to the teacher attendees of GIFT
Entrance: Maria-Theresien-Platz 1010 Vienna

18:30-20:00 Ice breaker party at Austria Center Vienna (ACV)
EGU General Assembly place
Bruno-Kreisky-Platz 1, 1220 Vienna

Monday, 28 April 2025

08:30-08:45 Opening GIFT25
EGU welcomes GIFT participants
with President of EGU + Chair of the Education Committee (EC)

08:45-09:30 Lecture 1
The major stages in the discovery of the sea floor (history of sea floor exploration)
by **Angelo Carmelenghi,**
OGS Trieste, Italy

09:30-10:15 Lecture 2
The « F.A.M.O.U.S » decade (French American Mid Ocean Undersea Study),

1974-1984, the first-ever marine scientific exploration by manned submersibles of a diverging tectonic plate boundary on a mid-ocean ridge.
by **Jason P. Morgan**,
Institute of Marine Science, CSIC, Barcelona, Spain

10:45-11:15 Welcome in Bremen Core Repository Collection (by ZOOM)
A virtual visit at the Core repository repository at MARUM,
Center for Marine Environmental Sciences at the University of Bremen
by **Ulrike Prange**,
ESO Outreach Manager,Team Science Communication at MARUM

11:15-11:35 IODP School of Rock:
An Enduring Legacy from Two Decades of IODP programming
and opportunities in the U.S. and beyond
by **Sharon Cooper**,
Lamont Doherty Earth Observatory**,** Columbia University

11:35-12:20 Lecture 3
Iceland and the surrounding seafloor,
insights into a complex geological system from its origins to the present day
by **Dr. Rouwen Lehné,**
Environment and Geology (HLNUG*)*
Department Geology and Soil, Technische Universität Darmstadt

12:20-12:30 INSTRUCTIONS for the poster session & the hands-on sessions

14:00-18:00 HANDS-ON ACTIVITIES (WS 1-2)
(2 groups alternating, 2 sessions x 1h30)

14:00-15:45
WS 1: Exploring the Ocean Floor: Seeing plate tectonics below the waves
by **Pete Loader[1], Pane Perunovski[1], Dragos Tataru[1], & Gina P. Correia[2]**
[1]EGU Geoscience Education Field Officer (GEFO) ; [2]EGU Education Committee

16:15-18:00
WS 2: Copernicus Browser:
An open online platform for teaching geography with satellite (Sentinel 2) images
by **András Zlinszky,**
Copernicus Data Space Ecosystem, Sinergise Solutions GmbH

18:00 TOUR OF THE EGU EXHIBITION

19:00-20:00 Townhall Meeting
The Educational Activities organised within several committees at EGU in cooperation with Outreach and EDI Committees
Presentation of Education Committee goals and initiatives
with **Stavros Stathopoulos, Gina P. Correia, Giuliana Panieri, Teresita Gravina, Solmaz Mohadjer**

Tuesday, 29 April 2025

08:30-09:15 Lecture 4 (by ZOOM)
Diversity of hydrothermal fluid discharges at the seafloor
according to geological context.
by **Valérie Chavagnac,**
Géosciences Environnement Toulouse - CNRS UMR5563/UPS/IRD/CNES

09:15-10:00 Lecture 5
The seafloor life - Biodiversity of hydrothermal vents
by **Daphne Cuvelier,**
Institute of Marine Sciences, OKEANOS, University of the Azores

10:45-12:30 HANDS-ON ACTIVITIES (WS 3-4)
(2 groups alternating; 2 sessions x 1h00)

WS 3: Maps
Using maps to study the seafloor (paper and digital tools) with geomapapp
Presentation of the portal and exercises to calculate seafloor spreading rate (and/or plate motion) from the database
by **Teresita Gravina** and **Francesca Funiciello,**
Education Committee members

WS 4: From the seafloor to the classroom:
how to engage secondary school students in oceanographic expeditions
by **Hélder Pereira**[1] and **Faustine Gendron**[2]**,** Teachers at sea
[1] Lycée des Maisons d'Education de la Légion d'honneur, Saint Denis, France
[2] Escola Secundária de Loulé, Algarve, Portugal (EduCom member)

14:00-14:45 Lecture 6
Exploring the deep oceanic lithosphere on land:
a field trip in the Oman ophiolite
by **Georges Ceulener**,
Géosciences Environnement Toulouse - CNRS UMR5563/UPS/IRD/CNES

15:00-15:45 Lecture 7
Ocean crust in the mountains (ophiolithic series and orogenesis) -
by **Jean Marc Lardeaux,**
University Cote d'Azur

16:15-18:00 POSTER SESSION
Discovering the Seafloor in Class
Teachers present and share school projects at EGU G.A

18:00-19:00 NETWORKING EVENT IN THE POSTER HALL

Wednesday, 30 April 2025

08:30-09:15 Lecture 8

When seafloor disappears in the subduction zone - Plate tectonics and the evolution of subduction zones

by **João C. Duarte**

Instituto Dom Luiz (IDL), Faculty of Sciences of the University of Lisbon, Portugal

09:15-10:00 Lecture 9 (by ZOOM)

Formation of oceanic crust and the tectonic and magmatic diversity of mid-ocean ridges,

by **Mathilde Cannat**,

IPGP, France

10:00-10:15 GIFT CERTIFICATES DISTRIBUTION

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10:45-11:30 Lecture 10

Formation and preservation of seafloor massive sulfide mineralization along ultraslow spreading ridges: An insight from the Arctic Ocean

by **Sabina Strmic Palinkas**

UiT The Arctic University of Norway and University of Bergen

11:30- 12:15 Lecture 11

The seafloor mineral resources for tomorrow

by **Clifford Patten,**

Institute of Mineralogy and Petrography**,** Innsbruck University

13:00 GENERAL SESSION AND CONCLUDING REMARKS & GOOD BYE!

By **Jean-Luc Berenguer & Stavros Stathopoulos**

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