אוניברסיטת חיפה
University of Haifa
جامعة حيفا

LEON H. CHARNEY
SCHOOL OF MARINE SCIENCES
בית הספר למדעי הים על שם ליאון צ'רני

Newsletter

WINTER 2021

The Leon H. Charney School of Marine Sciences

GREETINGS FROM THE HEAD OF THE SCHOOL

As we head into 2022, the effects of the COVID-19 era are still upon us, and we have yet to see any evidence of a quick return to normalcy. Instead, we are learning to live alongside the pandemic and keep to our agenda, with the objective of developing marine sciences at both a regional and global level. In this newsletter, which sums up the activities of our researchers, students, and staff from the past six months, we describe our individual and community achievements, highlight our new team members, shine a spotlight on what our graduates are doing, and focus on some special projects from this past year. I would like to take the opportunity to welcome our new faculty, post-doctoral fellows, and students, and congratulate students who are finishing their degrees and theses and are off to a new start. Congratulations also to our academic faculty who have been working hard to procure research funds, execute projects, and publish their research. Special congratulations to our newly promoted and tenured faculty. Finally, special thanks to our students and faculty that have been busy engaging the wider community (see the summary of the SEA conference) and advising decision makers on the state of our marine resources and the need for action and management so that these resources keep sustaining us into the future.

A special note: SAVE THE DATE FOR THE 9TH HAIFA CONFERENCE "CLIMATE CHANGE AND OUR OCEANS" THAT WE ARE ORGANIZING ON JUNE 19, 2022. This year, our students will lead the conference and be involved at all levels from planning and organization to execution and participation. We look forward to an exciting event.

I WOULD LIKE TO TAKE THIS OPPORTUNITY TO WISH EVERYONE A WONDERFUL 2022. HOPE YOU ENJOY THE NEWSLETTER.

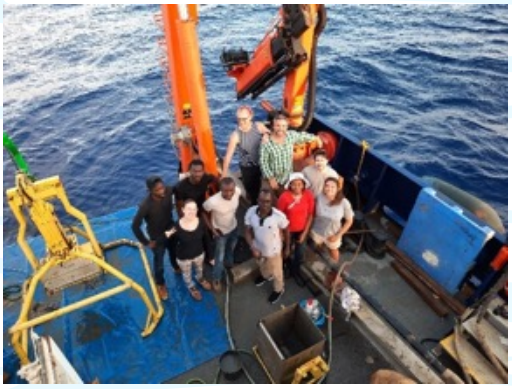
Adam Berman-Frank

NEWS FROM DEPARTMENT HEADS

Dr. Moses Strauss Department of Marine Geosciences
Dr. Beverly Goodman-Tchernov

The Department of Marine Geosciences has had many reasons to celebrate the past half year! First, congratulations are due to Prof. Uri Schattner on his recent promotion. Uri is one of the founding members of the department, and his promotion to Associate Professor represents the growth and development of Marine Geosciences at the university. Dr Nicolas Waldmann received an ISF-NSFC (China) grant that will address Pliocene environmental changes. A grant to the MGM (Marine Geoarchaeology and Micropaleontology) Laboratory by the Pristine Seas Project, led by Dr. Enric Sala of National Geographic was extended with a second grant to continue work for the next five years. We've spent a lot of time in the news and on television recently, including an article on researchers contributing to understanding climate issues, an appearance on the popular Discovery Channel series "Mysteries of the Deep", and a recent news story on research in the deep sea, showing multiple Charney School faculty and alumni, including Dr. Itzik Makovsky presenting the unusual deep-water shark nursery and brine pools. As restrictions are lifting, our members are returning to in-person conferences, including an impressive showing (represented in over 30 talks and posters) at the Israel Geological Society annual conference, held in Yerocham, the first in-person conference in 2021 in Israel (and perhaps the world!). Some students also presented with great success and wonderful feedback at international conferences, mostly virtual, but some also in person (ASOR, Chicago 2021). Our annual educational cruise, led by new part-time faculty member Dr. Mor Kanari (also an IOLR researcher), took place in the summer, and another cohort of ocean-trained geoscientists was successfully created! We are looking forward to a productive and exciting year, as we enjoy the celebrations of our many graduating students, despite the challenges of the COVID-19 pandemic.

November 2021 Graduate Students and Postdoctoral Fellows



2021 Summer Educational Cruise led by new faculty member (part-time with IOLR) Dr. Mor Kanari

Nothing is better than sunset before a nightshift from a research ship. Mediterranean July 2021

Photos: Dr. Beverly Goodman-Tchernov

The Department of Marine Biology

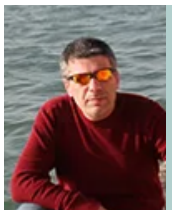
Prof. Tamar Lotan

In June, at the end of the spring semester, we had our yearly academic get-together with excellent talks and poster presentations. After a long period of restrictions, the meeting was a real face-to-face celebration with more than 80 participants. In that intimate atmosphere, we also celebrated the recent graduation of our MSc and PhD students, to whom we extended our warmest wishes for success. This academic year started with minimal restrictions, and most of our program is carried out in person, in a real class with face-to-face interactions. I would like to congratulate three of our faculty members that were recently promoted to associate professors: Prof. Smadar Ben-Tabou de-Leon, who studies sea urchin development and biomineralization; Prof. Laura Steindler, who works on microbial sponge interactions and the cellular energetic budget of microorganisms; and Prof. Daniel Sher, who studies marine chemical ecology, analyzing bacterial communication and interactions. I am also happy to report that Dr. Tal Luzzatto-Knaan was chosen this year for the "Homeward Bound" International Women in STEMM Leadership Initiative. She will participate in leadership workshops as well as a three-week expedition to Antarctica. Lastly, our students and faculty members were not only doing great science that resulted in many publications in top-tier journals, they were also highly involved in outreach throughout the year, giving lectures and workshops to children. Specifically, they were deeply involved in supporting the 8th Haifa Conference on Mediterranean Sea Research by organizing field experiments and scientific demonstrations for the general public all around Israel.

The yearly academic get-together.
Photo: Hagai Nativ

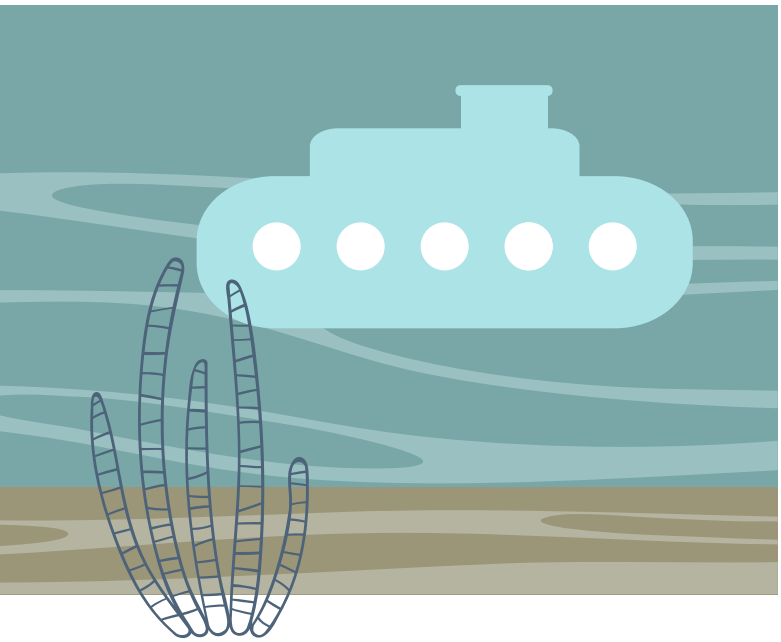
The Hatter Department of Marine Technologies

Prof. Morel Groper



Following an extended period of limitations and partial work at our IOLR facility resulting from the COVID-19 pandemic, our students, engineers, and faculty members all returned to the labs to continue their research and projects. In the Underwater Vehicles Lab (UVL), an immense amount of work has been carried out lately with both vehicles, the YONA ROV and the SNAPIR AUV operational and participating in unique missions. An exceptional mission of the YONA received massive media coverage via journalist Danny Kushmaro's story on Channel 12 TV news.

At the Subsea Engineering Lab, the Lagrangian robot developed by MSc student Yuri Katz underwent its Alpha test trial. This first trial was limited to a depth of only 20 m, yet the robot's performance was outstanding, and we are preparing for more challenging experimental trials. We've included a photo here showing the robot near the seabed, just before it started ascending to the surface. The development of ALICE, our fantastic small AUV, continues with the focus now on the development of the new payload, comprising a forward-looking camera and sonar. Data fusion from these two sensors is a significant challenge, led by our PhD student Yevgeni Gutnik.



Some recent highlights from the Viseaon Marine Imaging Lab include a paper being accepted as an oral presentation at the British Machine Vision Conference. The paper was led by Antonin Sulc, who was a visiting student in the lab. Also, the Lab-developed underwater microscope was recently able to successfully image giant sulfur bacteria at a depth of 1000m using the YONA ROV. Two new projects began at the lab concerning the analysis of 3D structures of coral reefs funded by the Israel Innovation Authority and the Israeli Council for Higher Education - Planning and Budgeting Committee's Data Science Program. The Viseaon lab has been working on underwater 3D modeling for the past four years. Recently, we were featured in the Science Spotlight section of the Sketchfab website, a leading platform for online 3D content. We invite you all to have a look at the blog post, which was written for the general public. It describes our motivation, workflow, and thoughts about the future of 3D modeling for science and society.
Finally, Aviad Avni, who was the Viseaon lab engineer for the past six years, left the lab. Amir Dayan and Nir Zagdanski are replacing him. We wish all good luck in their new positions.

From June to November 2021, the Underwater Acoustic and Navigation Laboratory (ANL) focused on three environmental sustainability research tasks. The lab deployed an array of passive acoustic recorders in front of the dolphin reef in Eilat to examine correlations between acoustic emissions of dolphins and the presence of surface vessels. Our analysis showed an accuracy of 97% in predicting the presence of vehicles based on dolphins' emissions, thus providing the first systematic proof that surface vessels impact the behavior of dolphins. In a second task, the lab developed an active acoustic system to detect acoustic reflections from sea turtles.
The method builds upon the expected frequency diversity in the response and can discriminate between reflections from sea turtles and reflections

from other marine animals. We also developed a prototype for the CETI system for passive detection of sperm whales off the coast of the Dominica island in the Caribbean. The prototype comprises four simultaneously sampled hydrophones and tracks its own orientation. The prototype was tested in four sea trials and is planned to be deployed in Dominica in January 2022.

The Autonomous Navigation Sensor Fusion Lab (ANSFL) is growing with the addition of four new students to our team. Most of ANSFL's research is focused on data-driven based navigation and sensor fusion approaches resulting in five published journal papers and five more under review. A special session organized by ANSFL will be held at the First International Israel Data Science Initiative Conference (IDSI 2022) on January 3–6, 2022. The session will showcase ANSFL's research in data-driven based navigation. Recently, ANSFL's team presented three papers at leading conferences: our MSc student Mor Yona presented his research on compensating for partial Doppler velocity log outages by using deep-learning approaches at the IEEE International Symposium on Robotic and Sensors Environments (ROSE 2021); Shunit Truzman talked about the Influence of home appliances on the smartphone's inertial sensors at the IEEE Sensors Conference; and our PhD student Eran Vertzberger introduced a data-driven approach for attitude and heading adaptive estimation at the International Conference on Indoor Positioning and Indoor Navigation.

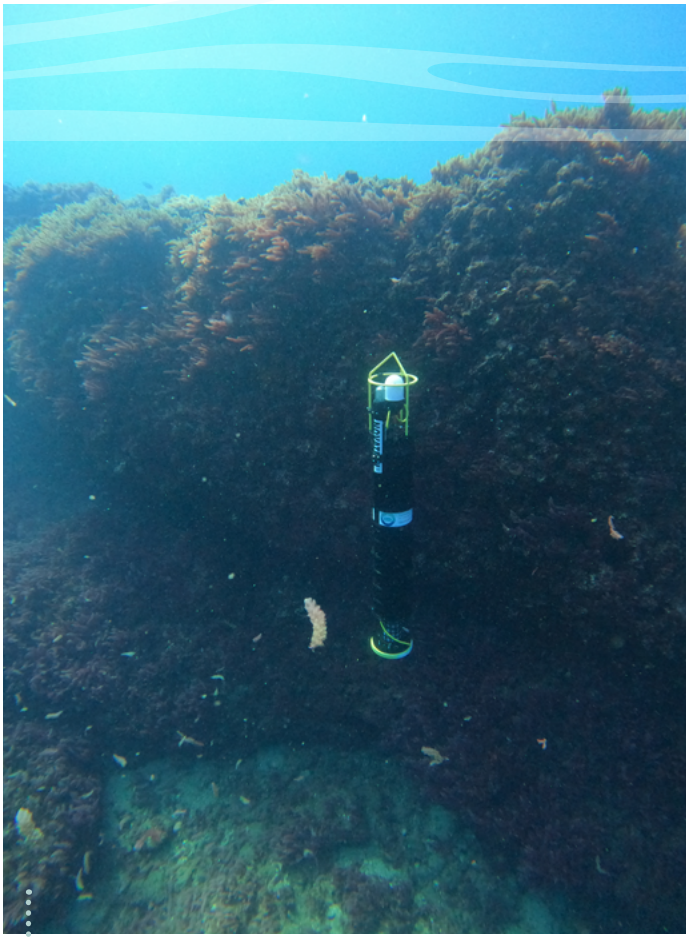


Photo: Yevgeni Gutnik

WELCOME NEW FACULTY

Dr. Mor Kanari, Dr. Moses Strauss Department of Marine Geosciences

I am a marine geologist and geophysicist mapping the seafloor and its sub-surface and often puzzle about the processes that dominate its formation and deformation. The creation and changes of the seafloor and its underlying geology have a striking impact on both wildlife and humans. They form habitats for animals and provide resources, but also pose geohazards to human activity. I study the inter-relations between seafloor geology, human activity, and the animal kingdom habitats of the marine environment. I am also a father of three wild Earthlings who usually hang barefoot from trees, and I attend a bonfire every Thursday.

NICE TO MEET

Welcoming our new Azrieli Postdoctoral Fellow

We are happy to welcome our new post-doctoral fellow from the Azrieli Fellows Program, Dr. Emmanuel Guiller. The Azrieli program's self-stated mission is to support and assist outstanding researchers seeking to become the next generation of academic leaders, while promoting advanced science and scholarship for the betterment of society. Fellows are supported so that their research can be developed and to create and strengthen links between Israeli researchers and their international contemporaries.

We wish Dr. Guiller a productive and happy time in our School and hope that his experience will be a positive and enriching one.
Host - Dr. Nicolas Waldmann
The Basin Analysis and Petrophysical Lab (PetroLab)
Dr. Moses Strauss Department of Marine Geosciences

Dr. Guiller conducts research in the field of paleoclimatology and paleoenvironments.

His work focuses on saline lakes and their sedimentary salt deposits throughout the geological record. Using a wide range of experimental and numerical modelling methods, Emmanuel harnesses these salt deposits and lake water archives to produce quantitative reconstructions of past climate variables (temperature, river discharges, etc.), which are then used to better grasp the evolution of atmospheric and oceanic circulations throughout geological times. By increasing knowledge on the evolution of past climate and its causes, Emmanuel hopes to contribute to a more accurate prediction of the climatic consequences of human activities. His research project at the PetroLab focuses on the climate of the Dead Sea over the last 200,000 years. Emmanuel was born in Brest, France.

After graduating from the École Nationale Supérieure de Géologie (ENSG), he spent a sabbatical in the French Alps where he roamed the mountains, increased his knowledge of flora and fauna, and worked as a guide and activity leader in a natural history museum to convey his concern and passion for nature to young and old. He completed his PhD at the Université de Lyon under the direction of geologist Dr. Véronique Gardien and physicist Prof. Frédéric Caupin. Emmanuel shares his passion for nature and physical and social sciences with his partner, with whom he often discusses their latest read over a glass of good wine. Together they love hiking and bird-watching. He also sings and plays the guitar.

Research Cruises supported by CSMS

CSMS annually supports research cruises designed by CSMS faculty and students to maximize interdisciplinary and cross departmental collaboration.

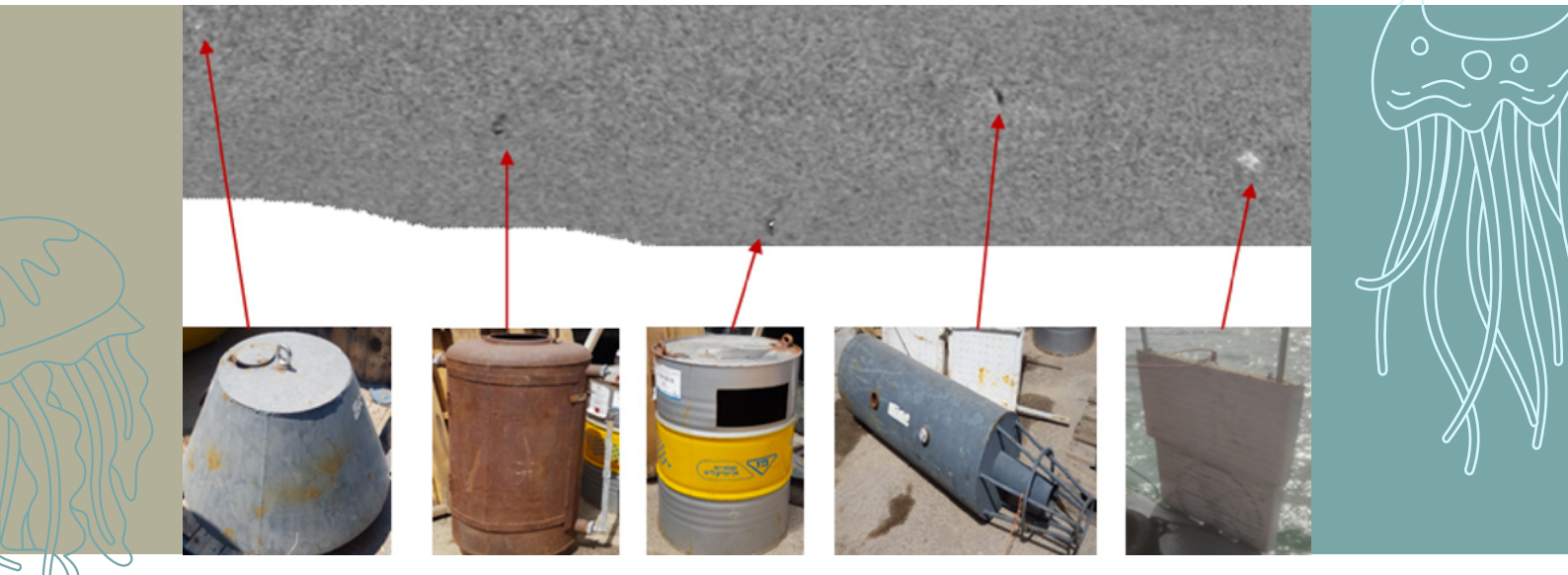
Below are highlights of last year's cruises.

Effects of Water Current on the Marine Environment: Implications on Geology, Biology, and Technology

Dept. of Marine Technologies: **Prof. Roee Diamant, Dr. Itzik Klein**
Dept. of Marine Biology: **Prof. Tamar Lotan**
Dept. of Marine Geosciences: **Dr. Revital Bookman**

Our recent cruises focused on the development of new methodologies to investigate water current-related phenomena. In particular, we explored ways to perform underwater navigation with the help of sand ripples (small hill-shape patterns in the sand caused by the water current); a scheme for characterizing sand by spectral analysis of multibeam sonar that uncovers holes in the sand due to current shifting; data collection of inertial data from an autonomous vehicle, in an attempt to develop a navigation approach that takes water current into consideration; and a new methodology to evaluate how jellyfish are drifting with the water current with respect to a Lagrangian drifter. As part of the project, we conducted three sea experiments, with a fourth one still pending. The first experiment involved the RV Bat Galim and was carried out in the Haifa Bay. In the experiment, we used the vessel's multibeam sonar to evaluate the spectral content of different sand types and its ability to collect multiple sand samples. The data from this experiment will be analyzed in Revital Buckman's lab. The second experiment, which also took place in the Haifa Bay, was conducted with the RV Shikmona, which deployed the MARSCI's AUV. An inertial sensor logger was attached to the AUV to record its motion; this data will be analyzed in Itzik Klein's lab. The second experiment also involved the AUV traversing above sand ripple patterns at different angles. This data was analyzed at Roee Diamant's lab and yielded a journal paper submitted to the Springer Journal on Autonomous Robots. The third experiment was carried out by a yacht in the Haifa Bay. It involved catching a jellyfish, attaching an acoustic tag to it, and releasing it together with a self-made autonomous submerged drifter. The locations of both jellyfish and drifters were estimated by means of acoustic location, and the conclusion was made that the jellyfish was not following the water current as the drifter did. Data collection and analysis was carried out by researchers and students from the labs of Tamar Lotan and Roee Diamant. A supplemental experiment is planned to evaluate this conclusion for three more jellyfish.

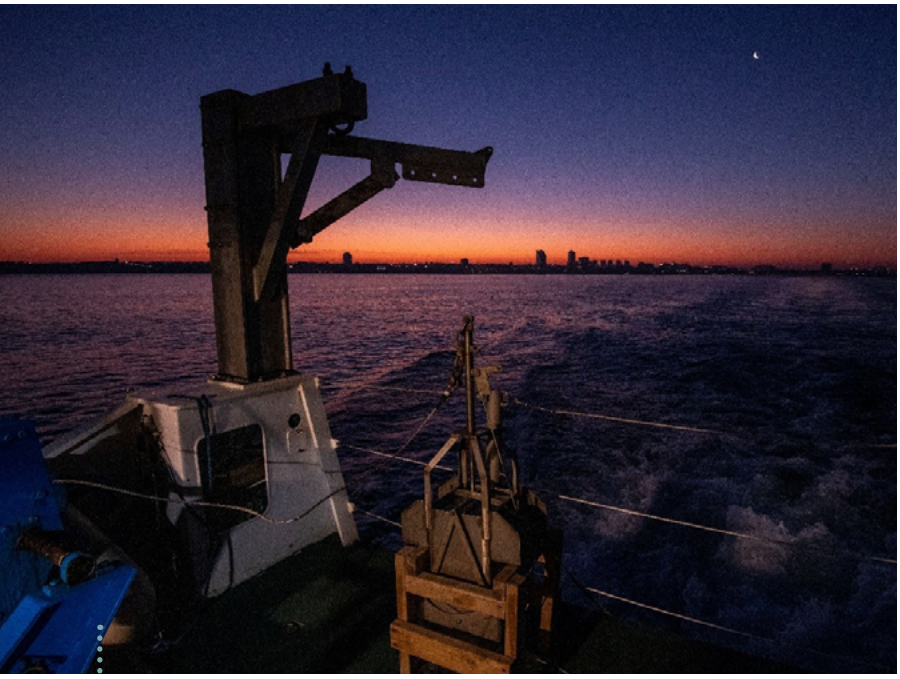
The attached figure shows pictures of the deployed targets and their appearance in the sonar BS image at 300KHz center frequency.



Regulation and function of phosphonate utilization in the Eastern Mediterranean Sea across time and space (submescoscale water patches)

Dept. of Marine Biology: **Prof. Laura Steindler, Prof. Michael Krom**
Dept. of Marine Geosciences: **Dr. Yoav Lehahn**

In 2021, the MKMRS chemistry laboratory, together with the Steindler lab, and with the cooperation of the Lehahn lab, carried out cruises and performed experiments to explore the nature of seasonality changes of nutrients (natural fertilizer) in the off-shore Eastern Mediterranean Sea (EMS). During these cruises, we found major changes in the annual nutrient cycling, which we are investigating further using high sensitivity chemical measurements. The response of the microbial community to these changes in nutrient availability was investigated using a new nutrient limitation experiment, which determines the response of both the photosynthetic bacteria and the entire community. These measurements together with light sensitive protein distribution and other bacterial uptake experiments are expanding our understanding of processes at the base of the food web in the EMS, which represents an important natural laboratory for extremely nutrient-poor areas of the global ocean.



Sunset aboard the Mediterranean Explorer Research vessel. The box corer (shown in the middle of the photo)is used for obtaining sediment samples without disturbing the sediment layers.
Photo: Hagai Nativ

Eli and Anat obtaining clean seawater samples from Niskin bottles arranged in a rosette.
Photo: Hagai Nativ.

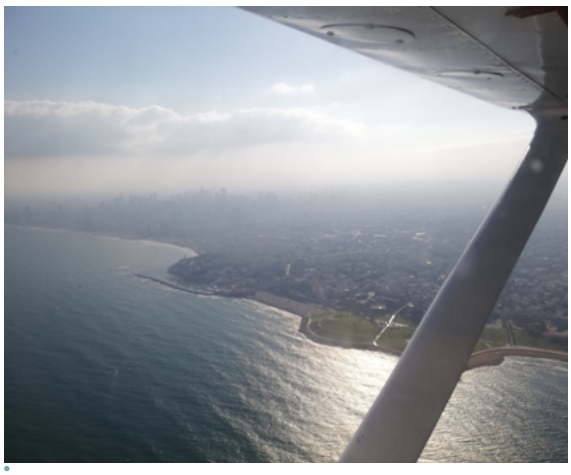
Dynamics of jellyfish swarms along the Israeli coast of the Mediterranean

Dept. of Marine Biology: **Prof. Tamar Lotan, Prof. Daniel Sher**
Dept. of Marine Geosciences: **Dr. Yoav Lehahn**
Dept. of Marine Technologies: **Prof. Tali Treibitz**

During June and July 2021, scientists from the Charney School and colleagues from other institutes went aboard the R/V Mediterranean Explorer to study the dynamics of jellyfish swarms along the Israeli coast of the Mediterranean Sea. Standard oceanographic measurements were complemented by aerial observations from drones and airplanes, which were used to direct the boat to the location of the swarm, and to map the overall distribution of jellyfish along the shoreline. The multi-platform observations collected in this research provide new insights on the motion of jellyfish and on the processes underlying their spatial and temporal distribution.

A drone image shows a part of the jellyfish swarm observed off the Israeli coast of the Eastern Mediterranean Sea in June 2020. Photo: Hagai Nativ.

For more information, take a look at two articles (in English in the Jerusalem Post, and in Hebrew in Colbo News) that appeared recently in the media about this fascinating research.



A view from the small airplane used to detect, in real time, the location of jellyfish swarms, and map their overall distribution along the Israeli coast of the Mediterranean Sea.
Photo: Hagai Nativ

MEET OUR STUDENTS

Niva Tadmor-Shalev - PhD Candidate

Precision aquaculture of marine algae modeling, using data fusion from diverse and multiple sources for food security, is at the center of my research interests. Together with a wonderful multidisciplinary and innovative team, including Prof. Dan Tchernov, the founder and chief scientist of the Morris Kahn Marine Research Station and Prof. Andrea Ghermandi, associate professor at the Department of Natural Resources and Environmental Management (both my supervisors), and in collaboration with Dr. Anna Brook, head of the Spectroscopy and Remote Sensing Laboratory at the Department of Geography and Environmental Studies and Dr. Alvaro Israel from ILOR, we paved this new innovative research trajectory. In my PhD studies, a portable field system for spectral identification of protein content in the red seaweed Gracilaria sp. was developed, providing real-time, high-throughput, non-distractive yield prediction in-situ without using a lab. This approach is basically applicable by using visible and near-infrared (VIS NIR; 400-1000 nm) spectroscopy measurements of the algae phenotype, and a deep machine learning algorithm trained to automatically extract useful patterns to perform protein content prediction.

Cultivated Gracilaria conferta samples - large phenotypic variability observed during the fall season reflecting a seaweed proteinic acclimation mechanism to changes in nutrient supply and incident light exposure. Cultivated biomass samples were classified via reflectance spectral features across the red pigment and protein wavelength (560-680 and 670-680 nm, respectively) using absorption depth.

MEET OUR ALUMNI

Dr. Roy Jaijel

Scientific Director at Agma – Watershed and River Center
PhD, Department of Marine Geosciences

"As part of my doctoral studies, I acquired multiple tools that help me in my work today as the scientific director of Agma – the Watershed and River Center. Among other things, I learned about the need for multidisciplinary study to answer complex questions; the need to examine experimental results and samples in depth; and the need to do everything with the integrative, critical perspective of the main research queries. As part of my studies, I participated in marine research missions in Israel and around the world, as well as in scientific conferences. Both contributed greatly to my professional development and helped me create relationships with researchers from different countries, who help me in my work even today."

CONGRATULATIONS

Congratulations to our faculty for newly funded grants:

Principal investigator	Project name
B. Goodman Tchernov	Pristine micropaleontology (or Pristine Sands) - National Geographic
D. Tchernov	Active sonar project
I. Klein	Inertial navigation systems and sensor fusion
	Decreasing alignment time for ground navigation systems
M. Groper	Enhancing the operability of water-lubricated journal bearings by surface texturing
	Vertical motion mitigation of planing crafts using a passive energy absorber
R. Diamant	Underwater acoustic communication
T. Luzzatto Knaan	The multiple roles of biosurfactants in microbial communities
	Equipment for setting up an analytical lab exploring microbial chemical communication
T. Treibitz	Data-driven fabrication and evaluation for next-generation artificial reefs
Y . Makovsky	Geoacoustic characterization of the seafloor in the Levant Basin
	Model-based spatial mapping of habitats in Israel's Mediterranean Sea Exclusive Economic Zone
	Characterization of seafloor gas emanations and their potential linkage with sub-sea reservoirs in the Levant
T. Mass	Evaluating the mechanisms enabling temperate corals to persist and thrive in diverse environments
T. Mass	"Bringing the sea to Berlin" – the future of marine sciences building on high-resolution X-ray characterization methods at synchrotrons
N. Waldmann	Pliocene precipitation variability and environmental impact across mid-latitude Asia

Congratulations on faculty promotions

Tali Mass - Associate Professor
Tali Treibitz - Associate Professor
Laura Steindler - Associate Professor
Roee Diamant - Associate Professor
Daniel Sher - Associate Professor
Uri Schattner - Associate Professor

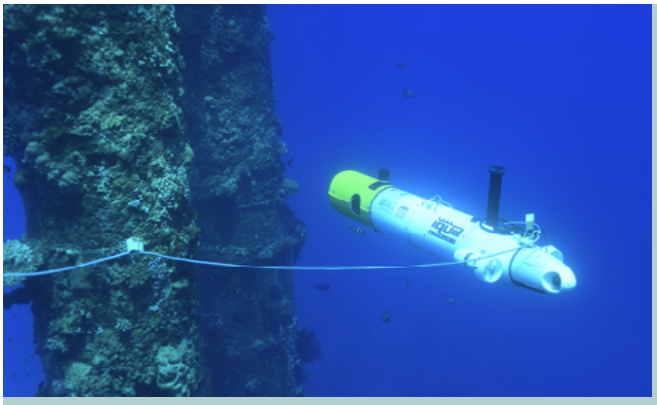
Dr. Aviad Scheinen, Apex Predators Principal Investigator at the School, named National Geographic's 2021 "Emerging Explorer"

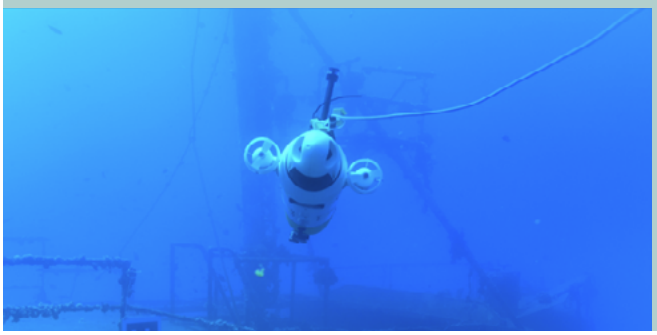
Dr. Aviad Scheinen has been named by National Geographic as one of the 15 Emerging Explorers of 2021, changing the world "one idea at a time."
Dr. Scheinin is the head of the Marine Apex Predator Lab at the Morris Kahn Marine Research Station. In this capacity, he has for decades been one of Israel's leading researchers on sharks, rays and coastal dolphins.
Read more in the Jerusalem Post article

RESEARCH HIGHLIGHTS

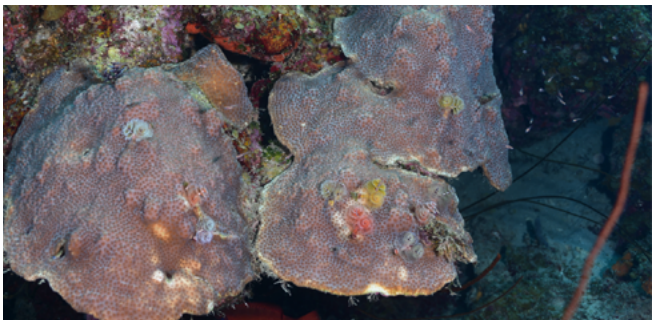
The Viseaon Marine Imaging Lab, Prof. Tali Treibitz

1) Science spotlight on Sketchfab:
The Viseaon Marine Imaging Lab has been working on underwater 3D modeling for the past four years. Recently, we were featured in the Science Spotlight section of the Sketchfab website, a leading platform for online 3D content. We invite you all to have a look at the blog post, which was written for the general public. It describes our motivation, workflow, and thoughts about the future of 3D modeling for science and society.
https://sketchfab.com/blogs/community/underwater-imaging-for-coral-reef-3d-mapping/ [best to add the link to the words "blog post" above, and not as a plain URL here]

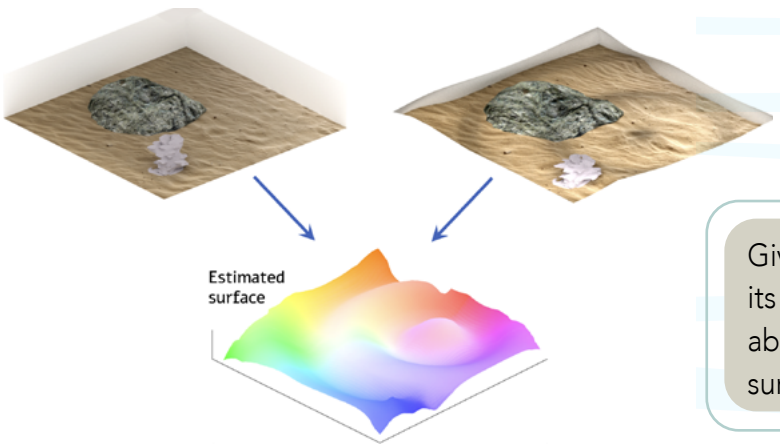




2) The Alice AUV: we conducted initial trials with our integrated forward-looking camera and sonar.



3) Viseaon Marine Imaging Lab team member Matan Yuval is conducting fieldwork in the Southern Caribbean in collaboration with Dr. Pim Bongaerts from the California Academy of Sciences to study the similarities in coral reef ecosystems in different oceanic regions.



Given a known background object and its image through a water surface, we are able to reconstruct the 3D structure of the surface.

The Environmental Sedimentology Lab

Dr. Revital Bookman

The Dead Sea environment never stops surprising us. While the name of this hypersaline lake is a testimony to its extreme conditions, biological life is active in its brine. A new collaboration between Dr. Revital Bookman from the Department of Marine Geosciences, Dr. Sarit Avrani from the Department of Evolutionary and Environmental Biology (U of Haifa), and Dr. Nadya Teutsch from the Geological Survey of Israel explores the interplay between water chemistry and microbial life in one of the most extreme environments on earth. The researchers sample seasonally the waters of hydrological sinkholes that developed along the shores of the Dead Sea due to drastic and continuous anthropogenic-level retreat, with the aim of revealing the biotic life in that environment and its adjustment to the changing extreme conditions.

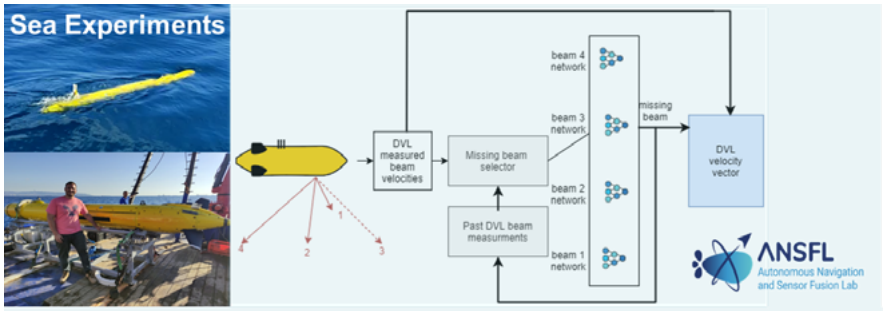
Water samples from different pools exhibit exotic colors that express the dynamic and complex chemistry and biotic life in the region.

The Autonomous Navigation and Sensor Fusion Lab

Dr. Itzik Klein

The purpose of navigation is to determine the position, velocity, and orientation of manned and autonomous platforms, humans, and animals. Obtaining accurate navigation commonly requires fusion between several sensors, such as inertial sensors and global navigation satellite systems, in a model-based nonlinear estimation framework.
At the Autonomous Navigation and Sensor Fusion Lab, we develop data-driven and hybrid mode/ data-based approaches to enhance navigation and estimation tasks.

Those algorithms include:
1) autonomous underwater vehicle (AUV) navigation with partial measurements,
2) adaptive nonlinear filtering with model uncertainty for autonomous vehicles,
3) quadrotor dead reckoning.
Focusing on AUV navigation, a deep learning framework to compensate for situations of partial beam measurements was proposed. To that end, past Doppler velocity log (DVL) beam measurements are plugged into a dedicated network to regress the missing beam velocity. Once obtained, that value is combined with the other measured DVL beams to estimate the vehicle velocity vector in a hybrid mode/learning approach. Sea-based experiments made with the Snapir AUV in the Mediterranean Sea showed the benefits of using the proposed approach.

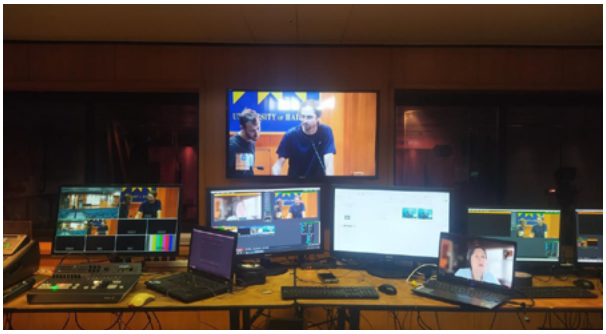


Compensating for partial DVL measurements with a deep learning framework

CONFERENCES/WORKSHOPS

The 8th Haifa Conference on Mediterranean Sea Research:

The Charney School's annual conference on Mediterranean Sea Research was dedicated this year to a combination of marine research, science education, and art. According to conference organizers Dr. Michael Lazar of the Department of Marine Geosciences and Dr. Daniel Sher of the Department of Marine Biology, that integration of different disciplinescan help make marine research more accessible to the public. The combinations that emerged from this conference, and the meetings between researchers, educators, and artists allowed them to realize that they can create a whole greater than the sum of its parts – those achievements represent a great start for us.



FROM THE MEDIA

Link to the full media coverage of CSMS activities:

marsci.haifa.ac.il/en/school/news/

Selected articles:

Showcasing the Dept. of Marine Technologies to UAE Minister of Education

United Arab Emirates Minister of Education, Hussain bin Ibrahim Al Hammadi visited the School as part of a delegation of Emirati senior officials. Introduced to the School's renowned marine sciences research, he remarked that "education is the antidote for challenges in the Middle East and throughout the world".

Forbes Magazine features groundbreaking marine research led by the Charney School

"Unprecedented discoveries led by University of Haifa scientists could transform our understanding of climate change and global sustainability," according to the latest "Editor's Pick" in Forbes Magazine. The magazine article featured high-profile studies underway at the Charney School, including the discovery of the largest concentration of small sharks and shark eggs ever found off the coast of Israel (the discovery was featured in The Daily Mail) and participation in the CETI (Cetacean Translation Initiative) Project.

Rising sea levels threaten coastal biodiversity of rare rocky reefs on Israel's coast

"A new study led by Prof. Gil Rilov (Department of Marine Biology) has found that rocky reefs may disappear in the coming decades due to rising sea levels caused by climate change. The reefs constitute a unique and rare marine ecosystem on the northern shores of Israel. Prof. Rilov's team used 3D topographic mapping and SLR (sea level rise) simulations to reach their conclusions, which were published in Science of the Total Environment.