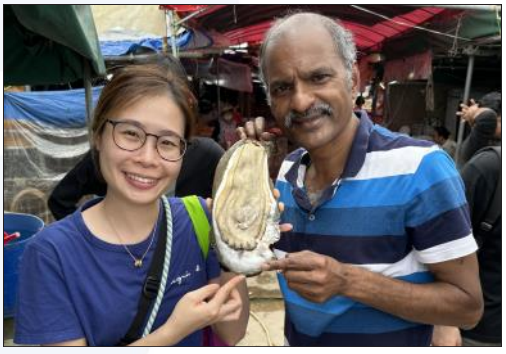
The Swire Institute of Marine Science

太古海洋科學研究所



Annual Report

2022

Gray & Mr Barnaby Swire during his visit to SWIMS

Director's Foreword

A new year and a new Annual Report format! 2022 was a better year for SWIMS as we managed to re-establish operations and open for laboratory work, despite the ongoing COVID saga. The aquarium, including the CO_2 supply system and heating units for the new indoor system, continued to develop and the clean laboratory was also re-designed with facilities for molecular work. Research at SWIMS kicked back into operation!

We were also able to welcome back > 250 visitors, albeit under COVID restrictions, from various groups. We hosted Hong Kong's Oyster Hatchery Kick Off meeting led by Rajan and a Collaborative Research Fund - MarineGEO Collaboration meeting led by Shelby and Dave. We also welcomed colleagues from HKU and outside groups such as Swire Management Team as well as schools and charitable organizations. During International Coastal Cleanup Day consulate members of the European Union in Hong Kong visited, led by Christelle, and conducted a beach clean up at Lap Sap Wan. We also hosted a joint workshop with AFCD staff to discuss future opportunities to better manage and conserve the Marine Reserve. In an exciting few days SWIMS provided an operations base for the Explosive Ordnance Disposal Bureau to detonate an unexploded WWII mine found on the seabed, and SWIMers had a prime view of the explosion!

In terms of our collaborations with Xiamen University, we initiated the SWIMS – MEL Xiamen University postgraduate programme where we admitted two students (Jialu HUANG and Yichi ZHANG) to conduct their PhDs between the two institutions. At the end of 2022 we were extremely pleased to launch The Swire Coastal Outreach Hub, funded by Swire Trust, to develop an outreach program to share SWIMS' science with the local public to help create a sustainable coastal environment.

This year we were very sorry to say goodbye to Stefano who returned to the University of Florence where he has taken up the role of Vice President, International and Postgraduate Studies. We wish Stefano all the best and he will continue to keep in touch with SWIMS to co-supervise students and continue some teaching duties.

Finally, to end the year, we were delighted to host a special visit from Mr Barnaby Swire, Chairman of the Swire Group and son of Sir John Swire who originally opened the Swire Marine Laboratory in 1990!

Best wishes,

Gray A Williams

SWIMS Launches the Swire Coastal Outreach Hub

Although SWIMS is primarily an institute for research in marine science, public outreach and science communication has always been one of SWIMS' main pillars. Prior to construction for the SWIMS' expansion students from international schools and participants from various private organizations visited SWIMS to learn firsthand how scientists conduct research and about discoveries made by SWIMS students and faculty. More than ever, communicating science to students of all levels and outreach about marine research to all public stakeholders is critical for fostering an environmentally conscious public and spreading awareness about the importance of sustaining Hong Kong's marine resources.

Thanks to continued support from the Swire Group and a generous donation from Swire Trust Tomorrow, SWIMS can now allocate resources for staff and facilities devoted to developing and delivering a brand-new outreach and education program at SWIMS called the Swire Coastal Outreach Hub (SCOH). The program will include bespoke science modules that are designed to give participating students and visitors the experience of collecting data using methods employed by SWIMS flagship research projects. In addition, the newly expanded museum room will be converted to become a visitor area which will include professionally designed displays and kiosks for informing guests about marine biodiversity, introducing SWIMS to a broader audience, and spreading awareness about conserving Hong Kong's Marine Reserve. Finally, the SCOH will serve as a communication hub for environmental education organizations, government agencies, marine science institutions, and many other stakeholders in Hong Kong's marine community.

SWIMS has hired postgraduate alumni, Dr Phil Thompson, as publicity and outreach manager to lead the initial development of the SCOH. Phil has been an active member of SWIMS, both as a resident scientist with his research in coral physiology, and as an educator engaging students and the public about conserving Hong Kong's biodiversity during their visits to SWIMS. Mr Calvin Foo, former SWIMS research assistant studying the ecology of mussel and oyster beds, joins Phil as outreach officer to help deliver educational content to more local schools and a broader public audience.

Phil and Calvin

SWIMS Community Outreach in action

Visiting students explore the rocky shore at SWIMS

Science modules at SWIMS

Gray A Williams

Amy and Tun setting up sites in Lantau

Jackson and team manipulating bivalve densities

Ben's mobile physiological laboratory in Middle Bay

Yifei receiving his best presentation award at BECoME 2022

2022 was a great year for work on thermal ecology as July was the hottest on record in Hong Kong with 10 days exceeding air temperatures over 35°C. It was, therefore, an ideal year to complete the ECF funded rocky shore biodiversity assessment led by Valerie and her team of Brian, Steven and Jackson, as maximum rock temperatures were 1.5 °C higher than in 2021 and so the surveys will hopefully reveal changes associated with this stress. It was also a perfect time to kick off the new survey led by Tommy Hui to monitor shores in Lantau, funded by the Marine Conservation Enhancement Fund, where record rock temperatures of 64.9°C were recorded at Tai Long Wan. These high temperatures made fieldwork challenging and it took a real team effort from Tommy, Tun and Amy to establish thermal and salinity loggers around the monitoring sites in Lantau.

Another major challenge was to create the manipulative plots for the new RGC project investigating the impacts of mortality of ecoengineering oyster and mussel species on local biodiversity, led by Jackson. Jackson and his team of Alex, Calvin and a variety of students helpers established plots of different densities of bivalves to mimic mortality events at numerous sites along Hong Kong and are now assessing the impacts on the species which rely on these habitats. In tandem, Ben monitored physiological variation in rock oysters from sites around Hong Kong Island, including mortality rates which will help us assess natural mortality events in these bivalves.

In the cooler laboratory, Sarah conducted some of the first experiments in SWIMS new aquarium, as part of another RGC project. She conducted a common garden experiment to examine inter-individual and population variations in metabolic responses to tease apart the importance of phenotypic plasticity or local adaptation to thermal stress in high shore littorinid snails from Thailand, the Philippines, Singapore and Taiwan.

As COVID restrictions waxed and waned it was great to be able to join the BECoME conference in person, where Yifei won the prize for the best student presentation. We were also able to welcome May and Tun from our collaborator, Farng's group in Prince Songkal University, Thailand who joined to complete research for their Masters Degree and as a RA respectively. Adrian also submitted his thesis of the ecology of the high shore limpet, *Lottia*, where he was able to show that this animal basically aestivates to avoid thermal stress in the Hong Kong summer. Congratulations Adrian!

Bayden Russell

The year of 2022 was interesting for the Marine Futures Laboratory. As with many research groups the world over, we spent much of the year reinvigorating our research programme post-COVID, getting into the field and starting laboratory experiments again. We continued to concentrate our research on the effects of climate change on key species within marine ecosystems and how to design effective conservation and restoration under climate pressures. Ashley led a global meta-analysis of how to achieve effective oyster reef restoration (published in *Science Advances*); Jay published her experimental assessment of the intergenerational effects of marine heatwaves on sea urchins (in *Global Change Biology*); and Rhyn published his long-term research showing the decline in *Sargassum* forests because of decadal ocean heating (in the journal *Science of The Total Environment*). Khan (quantifying biodiversity associated with oyster reefs using molecular techniques) and Kaile (investigating the effects of climate change on algae) were also at the forefront of the activities, doing multiple experiments and a lot of lab work to make up for lost time during the COVID restrictions. Both have made fantastic progress and have set up for 2023 to be a highly productive year!

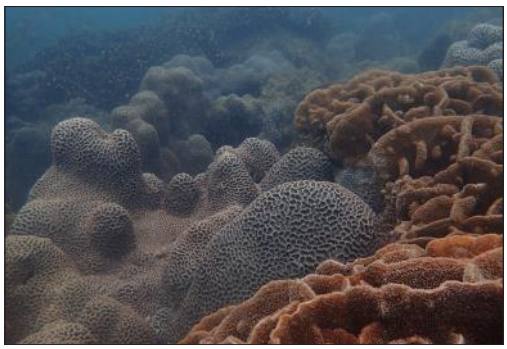
We also had a lot of celebrations with Rhyn, Jake, and Kevin all successfully defending their PhD theses at different times through the year. Congratulations Drs Cheung, Dytnerski, and Geoghegan! Cheryl rounded out a very successful year for the lab, submitting her PhD thesis in December. Overall, it was an inspiring year which promises to make 2023 even better.

The lab also had some big changes in staff throughout the year. We welcomed Dr Rhian Evans to the group. Rhian is using climate models to project the effects of marine heatwaves on populations of fish and invertebrates throughout East and Southeast Asia, using aquaculture species in her initial models because we have the most comprehensive understanding of their physiology. Sadly, we also said goodbye to Ashley and Jay this year, both of them moving to positions at other universities. It's fantastic to see them progress their careers, but they will be missed in our Marine Futures family!

All things considered, 2022 was a year of change for the lab but also very successful. The momentum from this year will continue into 2023 and allow us to build even more!

Bayden sieving samples to quantify the biodiversity on restored subtidal oyster reefs

Winter algal surveys reveal the abundance of juvenile fish associated with Sargassum *forests*



Benthic surveys to monitor change show just how dense coral communities can be in Hong Kong

Bayden is also experimentally assessing how marine heatwaves impact algal-dominated temperate reefs

V. ThiyagaRajan

Xin is showing stress tolerant oyster spats to growers

Kanmani is preparing samples for Electron Backscatter Diffraction study

Fazil, David and Leung are showing hatchery produced oyster larvae, seeds and spats

Group picture showing our interaction with local oyster industry, growers and government officials

Our oyster group has plenty of joyful news to share. We are continuing our outstanding grant success rate with the Research Grant Council, and secured big grants from industry and government to setup the Hong Kong Oyster Hatchery and Innovation Research Unit (HKO-HIRU). With this platform, not only have we published high-quality papers, but our graduate students have excelled to complete their thesis work. Here, we are excited to outline how our interdisciplinary collaborative team has performed.

Identified stress tolerant Hong Kong (HK) oysters: Xin has managed to stay in the oyster hatchery in mainland during this COVID period and successfully studied the transgenerational effects of ocean acidification (OA) on various life stages using three oyster generations. Xin has also traced stress tolerant molecular pathways in these oysters and shown that they are persistent in nature due to epigenetic mechanisms and are elevating the stress tolerance capacity of oysters. From these stress tolerant populations, now we are searching for 'supreme' oysters to produce seeds in the hatchery that can tolerate multiple stressors.

Biomineralization: Kanmani and Alessia have revealed how OA alters shell structure, mechanics and proteins using the power of microscopy and proteomics. Now, Kanmani is trying to mimic those structural features for biomedical applications.

Hong Kong's first oyster hatchery (HKO-HIRU): This is now in operation. Along with the expanded SWIMS outdoor aquarium, now we are equipped to breed stress tolerant oysters that Xin has identified. In this hatchery, David has identified how high salinity stress exacerbates winter mass mortality caused by parasites, and Fazil has optimized proteomics protocols to isolate immune and stress tolerant bioactive peptides. Our new Post Doc, Basanta along with the grower, Mr Leung are managing the hatchery and developing molecular breeding tools for HK oysters.

HK oysters – the nutrient-rich delicacy: Although HK oysters are advocated for their superior taste (more sugar!) by growers, only now, Ivan (our food chemistry Post Doc), in collaboration with the local oyster sauce industry, has shown that HK oysters are rich in essential nutrients.

Link with growers: We have run several workshops for knowledge exchange with local growers, aquaculture officials, NGO's and industry. This consistent link with all has started showing measurable impact on oyster aquaculture in the region – which all together, is now developing as part of an "impact case study".

David Baker - Shelby McIlroy

With the world finally opening up again, the Baker-McIlroy Lab attended both global and local conferences in 2022. One of the big highlights of the year was the lab attending the International Coral Reef Symposium (ICRS) in Germany, making connections with old and new friends. 3rd year students Roisin and Emily were awarded for their outstanding presentations with best student - poster and best oral presentation, respectively.

In local news, the Baker-McIlroy lab took part in HKU's annual Ecology and Biodiversity Research Symposium (EBRS). Wilson, Emily, Roisin and Joe were all on the planning committee and presented during the symposium and Shelby was invited to share the journey of her symbiosis research in a keynote address. Their hard work paid off with a smooth running event and Emily winning best lightning talk, presenting her work on trophic strategy shifts during wet and dry seasons in Hong Kong.

Research projects in Hong Kong also picked up speed in 2022. With the 2022 Seed Fund for Basic Research, Joe began running pilot studies in preparation for his large scale coral bleaching experiment at SWIMS. Alongside at SWIMS, Roisin also successfully ran her first experiment on coral symbiosis. Emily completed her 6 month transplantation experiment looking at coral trophic plasticity with lots of fieldwork aided by the lab team. Wrapping up the data collection for her thesis, Ali prepared samples for amino acid compound-specific stable isotope analyses. Together these projects represent a holoistic effort to understand the response of corals to global change.

The MarineGEO project continues to investigate the impacts of coastal urbanization on marine biodiversity. This year we brought together researchers and volunteers in one of the first "large" research events at our newly renovated facilities. Shelby's daughter Clover (8 yo) "snailed it!" sorting invertebrates alongside secondary school, undergraduate and graduate students. Wilson Wan, who has been an integral part of our coral restoration and biodiversity work transitioned from a Research Assistant to RPG student, and we welcomed Charlotte Ho as a new Research Assistant.

The year was a reminder of how much our research efforts thrive through collaboration and teamwork. We look forward to continuing to reconnect in 2023.

The team at ICRS in Germany

Joe, Wilson, Emily, Roisin and the 2022 EBRS committee

Emily preparing for her transplantation experiment

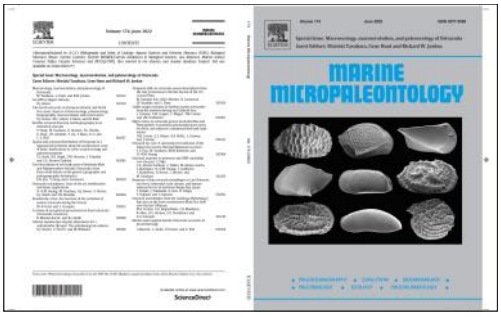
Lab diving selfie

Moriaki Yasuhara

Lab photo during the field excursion at the 19th International Symposium on Ostracoda, Lyon

Moriaki on sabbatical in Muséum National d'Histoire Naturelle, Paris

Vincent Perrier (the organizer) and Moriaki at the 19th International Symposium on Ostracoda, Lyon



Yasuhara et al 2022 cover of Marine Micropaleontology

2022 was an important year for the Yasuhara Lab. Three new PhD students, Jiamian Hugo Hu (deep-learning automation), Yichi Zhang (Ordovician ostracods), and Jialu Huang (Hong Kong oceanography and paleo), joined us. Welcome Jiamian, Yichi, and Jialu! Skye finished her PhD defence successfully, big congrats Skye! Moriaki took his first sabbatical this year (in Muséum National d'Histoire Naturelle, Paris and Natural History Museum of Denmark), which provided a really good time to refresh and to develop new ideas. He also continued to work with international networks including a policy brief on green geoengineering impacts on the deep sea, a Marine Horizon Scan to identify emergent issues and COP related papers, etc.

Moriaki was lucky to be invited to write a perspective piece for a wonderful *Science* paper by Salvatteci and co-workers on a down core reconstruction. *Science* artist Kellie Holoski did a great job to illustrate our big picture of the past, present, and future marine biodiversity where higher temperature and lower oxygen reduces both diversity and body size.

We were very glad that our ostracod special issue in *Marine Micropaleontology* is finally out this year! The issue showcased recent progress of ostracod research especially in macroecology, macroevolution and paleoecology. It includes exciting outcomes from our lab including Hong Kong ostracod distribution (Yuanyuan), the ostracod eye as a paleo depth proxy (Skye), and ostracods in databases (May)!

Moriaki's main interest has been on tropical biodiversity recently. The major review paper we have written for *Oceanography and Marine Biology: an Annual Review* is finally out after a tremendous amount of effort and enthusiasm of our wonderful team which made this possible! We indicated that the Hopping Hotspots model operates globally and showed both synthesis and detailed overview of Cenozoic tropical biodiversity hotspots globally. This is likely the first global synthetic and in-depth review on Cenozoic tropical biodiversity hotspots.

For 2023, many exciting studies are in various stages from in preparation to in press and Moriaki plans to dedicate a considerable time to foundational work, taxonomy, and also kick off new exciting projects after his sabbatical refreshment.

Christelle Not

My research group is a multidisciplinary team of scientists using geochemical tools to investigate environmental changes on recent and quaternary time scales. Our projects are diverse in nature, but all share a common focus on interdisciplinarity and communication. We are committed to making our research accessible to the scientific community and the public at large.

In 2022, my research group continued to pursue two important avenues of investigation: paleoclimate reconstructions and plastic pollution issues. Our focus on paleoceanography reconstruction of the North Atlantic Ocean since the last deglaciation aims to deepen our understanding of the impact of rapid climatic changes on deep water formation and related oceanic circulation. To achieve this, we are employing a multi-proxy reconstruction approach that incorporates various indicators such as foraminifera populations, stable isotopes, trace elements, and other relevant data sources.

Our work on plastic pollution involves assessing the degradation of plastic pieces present in natural environments. To accomplish this, we have deployed plastic pieces in different coastal settings and closely monitored changes in their physical and chemical properties, as well as the microbiome associated with these plastic pieces. Our experiments include a comparison of fossil-fuel based polymers and bio-based plastic polymers, in order to evaluate the environmental impact of so-called "green plastics".

Finally, we have also strengthened our research on mangrove ecosystems this year. In addition to investigating the level of plastic pollution and its impact on ecosystem services, we are estimating the Hong Kong mangrove carbon budget. This includes determining the carbon sink that Hong Kong mangroves represent, as well as the factors that affect carbon sequestration in this ecosystem.

Throughout our work, we remain committed to making our research accessible to both the scientific community and the general public. By fostering interdisciplinarity, communicating our findings effectively, and addressing critical environmental issues, we aim to contribute to the collective knowledge and inspire positive change towards a more sustainable future.

Plastic fragmentation experiment deployment

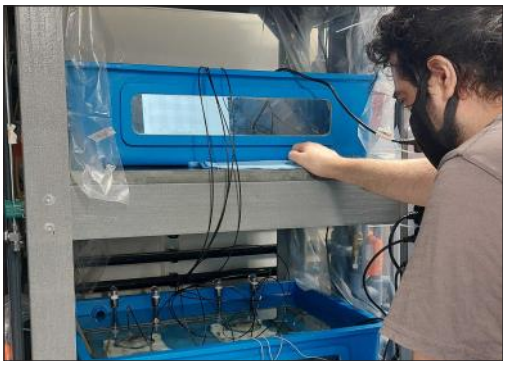
Plastic waste on Hong Kong beaches

Beach cleanup day: cleanup with EU office and EU countries consuls in Hong Kong

Presentation of citizen science project at the French International School

JD Gaitán-Espitia

Seagrass workshop at The Nature Conservancy



Marcelo conducting experiments on sea cucumbers

Simon holding a workshop on sea cucumbers

A montage of sea cucumber indoor aquaculture

In 2022, the activities of our group were focused on two main research areas. The first one aimed to assess the ecological condition of seagrass ecosystems in Hong Kong. In order to enhance the services they provide, we started a restoration program based on different planting approaches combined with genetic tools. This work has established the baseline for blue carbon and particularly seagrass restoration, as a nature-based solution in Hong Kong. We have established links with local NGOs and the private sector in order to expand the impact of this work and the engagement of the community.

The second main research area aims to understand the eco-physiological responses of marine ectotherms to climate change and extreme events. This research area is supported by two UGC -RGC grants (GRF and Joint NFSC-RGC schemes), addressing questions about the resilience of intertidal and benthic marine animals in response to extreme deoxygenation and warming events. These extreme conditions undermine mass mortalities of benthic and intertidal marine organisms documented across the globe. Thus, through these projects, we aim to provide tools for rapid assessment of ecological risks in natural populations facing extreme events in Hong Kong and the South Asia region.

Although our main research efforts were oriented to fundamental science, we also expanded our work into more applied research. As part of this, we developed the first pilot project for sea cucumber aquaculture in Hong Kong. These animals are considered a delicacy in the seafood market sector, particularly in China. As a consequence, they are highly exploited, driving populations to collapse in many parts of Southeast Asia.

Farming sea cucumbers provides a mechanism to mitigate the exploitation pressure and to support the recovery of wild populations. Considering the high economic value of these animals, there is great potential for developing this aquaculture practice in local waters, diversifying the livelihood opportunities for fishermen in Hong Kong.

Through these projects, our group aims to connect science, community and different stakeholders in Hong Kong, facilitating knowledge exchange and the sustainable use of our marine resources. We look forward to future collaborations in these areas!

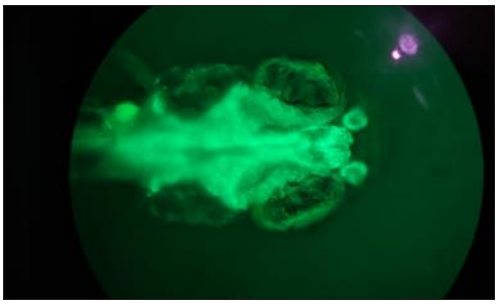
Celia Schunter

The Schunter team has had a fantastic year in 2022 as we started our cryptobenthic fishes project in Hong Kong (Marine Conservation Enhancement Fund). Cryptobenthic fishes are the small cryptic fishes that make up the base of the food web and little to nothing is known about them in HK. For this Maxine joined the lab and we also added Debora, an HKPF fellow, to the team. We also started working with our freshwater model species (the zebrafish) which facilitates many mechanistic fine-scale questions including neuro system effects with climate change. Specifically we are trying to understand how elevated temperature (as predicted due to climate change) affects the behaviour and the neural system in aquatic fishes. For this we look into their brains and study brain activity levels when exposed to different temperatures. Additionally, the whole lab worked on a collaborative project on how to annotate long non-coding RNA (lncRNA) in non-model species and study the regulation of gene expression through these lncRNA elements.

In 2022 we intensified our work on cleaner wrasses (*Labroides* spp.), which are fish species that clean other fish from parasites to keep them healthy. These species are key to fish biodiversity and coral reefs. We looked at what happens in their brains when they interact with so-called client species, based on a study published in 2022 with former MPhil student Sandra as first author. Post Doc Kang was working on assembling a first reference genome for *Labroides dimidiatus* and Post Doc Jose started investigating how cleaner wrasses learn. Daniele, a second year PhD HKPF fellow, went to MARE in Portugal to run further comparative experiments on interspecific interactions between cleaners and clients across species. Stay tuned for more stories on this cool fish!

Some exciting new scientific stories have been published in 2022 with our study on the natural laboratories of ocean acidification. We discovered that it is the difference in evolutionary rate (over millions of years) that provides the fish which evolved more rapidly with the flexibility to adjust to changing environments. This provides certain 'winner' species with an ability to respond to environmental changes such as ocean acidification caused by climate change. With the NSFC Excellent Young scientist award 2022 awarded to Celia the lab will keep pushing boundaries to understand how organisms respond, acclimate and adapt to rapid environmental change.

Behavioural testing of seahares response to ocean acidification run by Jade



We can now study the neural activation in live fish brains by using brain imaging techniques on zebrafish

Out in the field, diving to find little fish

Celebrating the graduation of Munisa

Nicole Khan

Coral microatoll exposed during the lowest tide of the year on a reef flat in Singapore

Howard with other attendees of the Delft Sea-Level Summer School at Zandmotor Beach, Netherlands

Examining marsh sediment stratigraphy with Juliet Sefton and Richard Jones in Venus Bay

PhD students Yonghui and Howard conducting fieldwork in the Mai Po mangroves

With easing of COVID restrictions, the Sea-level and Coastal Change Laboratory began attending conferences and meetings, giving seminars, and carrying out field work internationally in Singapore, the Netherlands, the United Kingdom, and Australia. Nicole attended the Paleo Constraints on Sea Level meeting in Singapore, where on a field trip they examined how coral microatolls precisely record the past position of sea level.

PhD student Howard Yu attended a sea-level summer school at Delft University in the Netherlands, learning about advanced techniques and challenges to measure and predict sea-level change as well as how decision-makers use available knowledge and assessment of uncertainties concerning future sea-level change. He later visited a collaborator at the University of York to discuss taxonomy of estuarine foraminifera from the Pearl River Delta.

After being awarded a Research Grants Council General Research Fund grant to improve knowledge on the drivers of sea-level change in Western Australia, Nicole visited collaborators on the other side of Australia at Monash University in Melbourne, giving a seminar and conducting fieldwork to explore the sediment stratigraphy of salt marshes in Venus Bay.

In Hong Kong, PhD students Howard and Francis Liu continued their work in Mai Po mangroves to use microfossils and environmental DNA to reconstruct past environmental and sea-level changes. The team welcomed a new member, PhD student Yonghui Qin, who started a project to quantify belowground carbon storage in Mai Po through mangrove root ingrowth. She will also try to understand how past sea-level changes have influenced carbon storage at the site over the last several millennia.

Philip Li

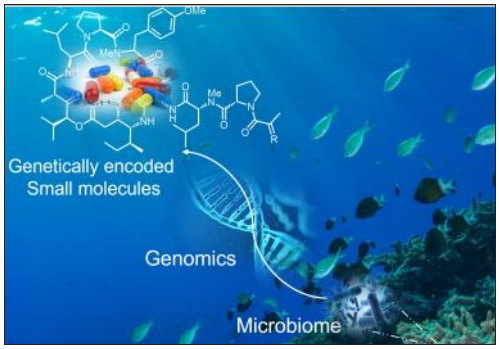
Philip's team is a group of researchers who are passionate about exploring the potential of ocean and human microbiota for innovative therapeutics. They are focused on creating an integrated platform for targeted antibiotic discovery from untapped microbiomes by leveraging the latest advances in bioinformatics, synthetic biology, and chemical biology. The goal is to unlock the genetic potential of ocean and human microbiota and harness the power of small molecule biosynthesis to develop new and effective treatments for global health challenges.

One of their recent studies, published in *Microbiome*, highlights the crucial role of lactic acid bacteria (LAB) in sustaining the human microbiome and regulating microbial communities. Through the analysis of human-associated metagenomes, they discovered new insights into LAB's biosynthetic capacity and its potential to regulate microbial communities in humans.

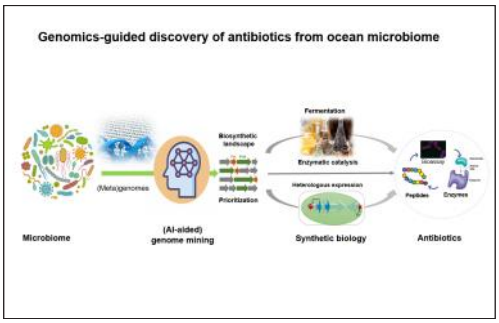
In addition to their work on antibiotic discovery, the team is also deeply committed to studying the chemical ecology of complex microbiota and the intricate "language" of host-microbe interactions. Through their research, they hope to gain a deeper understanding of how microbes communicate and compete with each other in their environments or host, identifying new targets for drug discovery and developing more effective strategies for maintaining ocean or human microbiome homeostasis.

Their latest research published in the *Microbiome Journal* reveals the first lantibiotic and anti-archaeal metabolites found in the archaea domain. The discovery of new lanthipeptides from archaea, which combat other archaea, sheds light on their metabolic potential and interactions in salty environments. These findings will inspire further research into archaeal chemical biology, uncovering new sources of bioactive metabolites.

Another study in collaboration with Zhang's Group from the Ocean University of China found that *Roseobacter* bacteria are crucial in breaking down thiosulfate in marine biofilms. Their research, published in *Nature Communications*, emphasizes the importance of microbial diversity in maintaining a healthy ocean ecosystem and provides new insights into the role of *Roseobacter* bacteria in marine sulfur cycling.

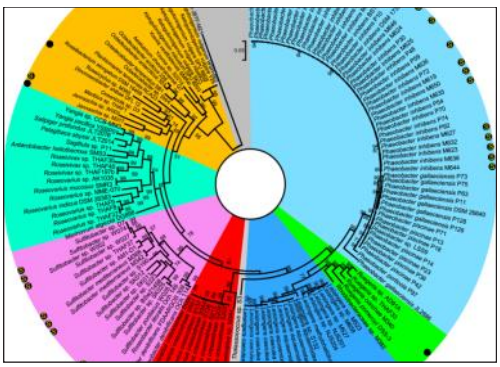


Drug discovery from the untapped ocean microbiome



Genomics-guided discovery of antibiotics from ocean microbiome

Philip and team at the 5th Mycology Symposium and the 3rd Microbial Pharmaceuticals Academic Conference



Roseobacter *bacteria are crucial in breaking down thiosulfate in marine biofilms*

A section of the new SWIMS aquarium system

Research Opportunities

The Laurence Caplin Scholarship in Marine Biology

Established in memory of Laurence Caplin by his widow, Mrs E Caplin and daughter, Mrs J Woodford, to bring young people to SWIMS to undertake research in marine biology with a resident staff member.

The Intertidal Trust Fund

Established in 1982 with profits from the book "The Seashore Ecology of Hong Kong", grants from the Intertidal Trust Fund can be made to overseas students and scientists who wish to undertake research on intertidal ecology at SWIMS.

Cape d'Aguilar Trust Fund

Established in 1995 with profits from the book "An Introduction to the Cape d'Aguilar Marine Reserve, Hong Kong", grants from the Cape d'Aguilar Trust Fund can be made to local or overseas students and scientists who wish to undertake marine biological research on the Cape d'Aguilar Marine Reserve at SWIMS.

Higher Degrees (M.Phil / Ph.D)

Students who are interested in undertaking a research postgraduate degree (M.Phil or Ph.D) in marine biology and ecology should directly contact SWIMS academic staff for more information regarding individual projects.

View of the newly expanded SWIMS sitting in the Cape d'Aguilar Marine Reserve

Student Research Assistantships/Internships

Undergraduate students holding a permanent Hong Kong identity card are encouraged to apply to work as volunteer student research assistants during the semester breaks/summer holidays. Undergraduate students from both local and overseas institutions who are enrolled in a degree programme, which requires the completion of an internship, may also contact us to discuss how we can facilitate that requirement. Interested students should contact SWIMS Secretary, Ms Sylvia Yiu.

SWIMS Publications (Jan - Dec 2022)

Aguilar R, Baeza JA, Prakash S, Ogburn MB, Pagenkopp Lohan KM, MacDonald III KS, Driskell AC, Leray M, Ahyong ST, McIlroy SE, Tuckey TD, Hines AH (2022) Unresolved taxonomy can confound the identification of invasive species: Introduction of a member of the *Lysmata vittata* Stimpson 1860 (Decapoda: Caridea) species complex in the western Atlantic. *Journal of Crustacean Biology* **42**: 1-18

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Other Contributions from SWIMS

Bayden Russell

Editor-in-Chief, *Oceanography and Marine Biology: An Annual Review*
Academic Editor, *PLoS ONE*
Associate Editor, *Frontiers in Marine Science*;
Funding Review College Member, British Ecological Society
Funding Reviewer, Ocean Park Conservation Foundation
Member, Association for the Sciences of Limnology & Oceanography (ASLO)
Member, British Ecological Society (BES)

Christelle Not

Scientific Advisor, "We love the Sea" campaign and exhibition, Agnès b., Hong Kong
Organizer, World Cleanup Day

David Baker

Director, HKU Stable Isotope Ratio Mass Spectrometry Laboratory (SIRMS)
Director, MarineGEO-Hong Kong
Associate Editor, *Limnology and Oceanography*
Associate Editor, *Proceedings of the Royal Society B*

Gray A Williams

Adjunct Professor, Xiamen University
Chairman, International Advisory Committee of the Dongshan Swire Marine Station (D-SMART), Xiamen University
External Advisory Board, CIM, University of Vigo, Spain
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Editorial Board Member, *Journal of Thermal Biology*
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Chair, International Research Group on Ostracoda (IRGO)
Deep Ocean Stewardship Initiative (DOSI), Climate Change Co-lead
Scientific Committee Member, bioDISCOVERY, Future Earth
Member, Global Ocean Oxygen Network (GO2NE), IOC-UNESCO
Member, State Key Laboratory of Marine Pollution (SKLMP)
Editorial Board Member, *Global and Planetary Change*; *Marine Micropaleontology*; *Open Quaternary*
Associate Editor, *Journal of Paleontology*; *Palaeoworld*; *Marine Biodiversity; Paleontological Research*
Editor, *Plankton and Benthos Research; Journal of Micropalaeontology*
Member, PAGES Q-MARE
Member, Annual Meeting Panel, Conservation Paleobiology Network
Advisory Board Member, NSF-funded project: FossilSketch: Developing a Digital Sketching Application That Delivers Personalized Feedback to Improve Student Learning and Engagement in Micropaleontology. NSF EHR DUE: IUSE 1937827
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Academic Editor, *PLoS ONE*
Editor (Review), *Aquatic Biology*, *Inter-Research Journal*
Editorial Board Member, *Global Change Biology*
Contributing Editor, *Aquaculture Environment Interactions*, *Inter-Research Journal*
Academic Member, State Key Laboratory for Marine Pollution
Council Member: Hong Kong Proteomics Society
Founder and Chairman of a symposium series: Interdisciplinary Symposium on Ocean Acidification and Climate Change (ISOACC)

Conferences and Workshops

Bayden Russell

Invited Seminar; The 4th International Symposium for Advances in Marine Mussel Research, 21-23 Nov 2022, University of Exeter, UK.

Celia Schunter

Invited Speaker; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.
Invited Talk; International Congress on the Biology of Fish, 28 Jun-1 Jul 2022, Montpellier, France.
Invited Seminar; Department of Ocean Science Departmental Seminar, 25 Nov 2022, HKUST, Hong Kong.

Christelle Not

Oral Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.
Invited Oral Presentation; Universitad-21 Symposium in Teaching Sustainability, 16-17 Feb 2022 (Online), Lund, Sweden.

David Baker

Keynote Speaker; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

Gray A Williams

Keynote Speaker; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.
Guest Lecture; The University of Johannesburg, 12 May 2022 (Online).
Invited Speaker; Application of advanced genomic tools for conservation of marine biodiversity, Centre for Marine & Coastal Studies (CEMACS), Universiti Sains Malaysia, 6-10 Jun 2022 (Online).
Invited Speaker; Trends and patterns in marine biodiversity in the West Pacific workshop, Asia Pacific Marine Biodiversity Observation Network (AP MBON), 31 Oct-3 Nov (Online).

Moriaki Yasuhara

Invited Keynote/Session Chair; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

Speaker; Big Data+AI+Deep Learning, Mini Symposium on Inter-departmental Research of Faculty of Science, 7 Jan 2022, HKU, Hong Kong.

Speaker; Ocean Science, Mini Symposium on Inter-departmental Research of Faculty of Science, 10 Jan 2022, HKU, Hong Kong.

Speaker; Environment and Climate Change, Mini Symposium on Inter-departmental Research of Faculty of Science, 13 Jan 2022, HKU, Hong Kong

Invited Plenary Keynote; Sun Yat-sen University and The University of Hong Kong Palaeontology Theme Workshop, 14-16 Jan 2022 (Online).

Oral Presentation; Q-MARE 1st Meeting: Climate and Pre-industrial Human Impacts on Marine Ecosystems: Crossing Disciplinary boundaries, 17-19 Jan 2022 (Online).

Oral Presentation/Session Organizer; The 53rd International Colloquium on Ocean Dynamics, 15-20 May 2022, The University of Liége, Belgium.

Invited Speaker; Séminaire CR2P, Muséum National d'Histoire Naturelle, 12 Jul 2022, Paris, France.

Moderator; GO2NE Webinar Series on Ocean Deoxygenation, UNESCO, 13 Jul 2022 (Online).

Oral Presentation/Session Chair/Workshop Organizer; The 19th International Symposium on Ostracoda, 18-25 Jul 2022, Lyon, France.

Invited Oral Presentation; The 129th Annual Meeting of the Geological Society of Japan, 4-6 Sep 2022, Waseda University, Japan.

Invited Seminar; Natural History Museum of Denmark, 28 Sep 2022, University of Copenhagen, Denmark.

Invited Seminar; The University of Southern Denmark, 13 Oct 2022, Odense, Denmark.

Invited Talk; Lund University, 20 Oct 2022, Lund, Sweden.

Invited Speaker; The CMEC External Seminar Series, University of Copenhagen, 25 Oct 2022, Copenhagen, Denmark.

Invited Speaker; Stockholm University, 1 Nov 2022, Stockholm, Sweden.

Invited Keynote/Session Organizer/Workshop Organizer; IPC6 International Palaeontological Congress, 7-11 Nov 2022, Khon Kaen, Thailand.

Invited Plenary Keynote; The Micropalaeontological Society Annual Conference, 10-11 Nov 2022, Bremen, Germany.

Invited Seminar; Talk@Eco-Environment & Health, 17 Nov 2022. (Online).

Shelby McIlroy

Invited Keynote Speaker; The 2nd Annual Ecology and Biodiversity Research Symposium, 1-2 Dec 2022, HKU, Hong Kong.

Conference Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

Nicole Khan

Keynote Speaker; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

Invited talk; International Geoscience Programme (IGCP) Project 725 'Forecasting Coastal Change' , 19 Jan 2022 (Online).

Invited Seminar; Nanyang Technological University, Mar 2022 (Online) Singapore.

Keynote Speaker; The 14th University Consortium of on Aquatic Science (UCAS) Postgraduate Symposium, 28 Mar 2022 (Online).

Invited Seminar; HKUST, Apr 2022 (Online) Hong Kong.

Invited Talk; at Nanyang Technological University, Jul 2022, Singapore.

Keynote Speaker; Paleo Constraints on Sea Level (PALSEA), 17-20 Jul 2022, Singapore.

Invited Seminar; Monash University, Nov 2022, Melbourne, Australia.

Isis Guibert

Conference Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

Phil Thompson

Conference Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

The controlled explosion of an old WWII mine seen from SWIMS

Postgraduates

Benjamin Chiu
Award: Best Presenter; The 2nd Annual Ecology and Biodiversity Research Symposium, 1-2 Dec 2022, HKU, Hong Kong.

Bovern Arromrak
Award: First Runner-up; HKU Three Minute Thesis (3MT) Competition 2022 (Online).

Coco Cheung
Oral Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.
Oral Presentation; MICRO2022 International Conference: Plastic pollution from MACRO to nano, 14-18 Nov 2022 (Online).
Award: Second Runner-up, HKU Three Minute Thesis (3MT) Competition 2022 (Online).

Emily Chei
Award: The 2nd Best Student Oral Presentation, International Coral Reef Symposium, 3-8 Jul 2022, Bremen, Germany.

Hamsun Chan
Oral Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.
Oral Presentation; MICRO2022 International Conference: Plastic Pollution from MACRO to nano, 14-18 Nov 2022 (Online).

Howard Yu
Participant; TU Delft Summer School on Sea Level Change: Evidence, Challenges and Policy, 29 Aug-2 Sep 2022, Delft, Netherland.

Jackson Lau
Participant; The 2nd Annual Ecology and Biodiversity Research Symposium, 1-2 Dec 2022, HKU, Hong Kong.

Joseph Brennan
Participant; International Coral Reef Symposium, 3-8 Jul, 2022, Bremen, Germany.

Kaile Zhong
Participant; The 2nd Annual Ecology and Biodiversity Research Symposium, 1-2 Dec 2022, HKU, Hong Kong.

Khan Cheung
Participant; The 2nd Annual Ecology and Biodiversity Research Symposium, 1-2 Dec 2022, HKU, Hong Kong.

Róisín Hayden
Award: Best Poster Presentation; International Coral Reef Symposium, 3-8 Jul, 2022, Bremen, Germany.

Yifei Gu
Award: Best Student Presentation; The 2nd International Conference on Biodiversity, Ecology and Conservation of Marine Ecosystems (BECoME), 3-7 Jan 2022, CityU, Hong Kong.

Xin Dang
Award: Best Presentation Award, The 2nd International Symposium on Marine Science and Technology, 13-15 Jul 2022 (Online), Hong Kong.

Zhenzhen Li
Participant; Basic Training Course on Multiple Stressors and Ocean Acidification, 24 Oct-4 Nov 2022, IAEA Marine Environment Laboratories, Monaco.

Exchange MPhil student May at Waterfall Bay

Visitors to SWIMS

Official Visitors:
Mr. Barnaby Swire (Swire Group)
Mr. Stuart Heaver (Croucher Foundation)
Mr. Guy Bradley (John Swire & Sons (H.K.) Limited)
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Mr. Aldric Chau (Cathay Pacific Airways Limited)
Mr. Helmuth Hennig (The Photographic Heritage Foundation)
Mr. Nicholas Kitto (The Photographic Heritage Foundation)
Mr. Edward Stokes (The Photographic Heritage Foundation)

Visitors:
Ms. Beatrice Lui (Tatler Asia)
Prof. Vivian Yam (HKU Dean of Science (Interim))
Mr. Shiu-Cheong Chung (Oyster Hatchery (China))
Mr. Wing-Kuen Chow (AFCD)
Dr. James Fang (The HK Polytechnic University)
Mr. Ho-Ka Law (Soonlution Technology Limited)
Mr. Edmund Lau, Mr. Wing-Hung Tam, Mrs. Elizabeth Mok, Ms. Claudia Wong & Mr. Brian Lee (Lee Kum Kee)
Mr. Chi-Ben Chan & Mr. Liu-On Chan (Oyster Farmer)
Mr. Walter Tang, Mr. Anthony Chang & Mr. Lell Luk (Ocean Park Corporation)
Ms. Ellen Mok (Swire Group)
Dr. Jane Wong (with CNN)
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Dr. Pun-Tung Ng, Ms. Flora Mok, Ms. Zoe Ho, Dr. Chun-Kit Kwok, Mr. Edward Wong (AFCD)
Ms. Wing-Kee Huen (Hong Kong Maritime Museum)
Ms. Hilma Choi, Mr. Ryran, Mr. Paco Chan & Mr. Gordon Lau (Gene)
Mr. Chi-Kuen Ng (Department of Civil Engineering, HKU)
Mr. James Ducher, Mr. Patrick Joyce, Ms. Alissa Bass, Dr. Laura Falkeniserg & Ms. Hin-Hung Tsang (CUHK)
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Ms. Isabel Li (Ocean Park Corporation)
Ms. Valerie Yip (Faculty of Education, HKU)
Ms. Jessica Leung (Faculty of Education, HKU)
Ms. Lily Tse, Mr. Aaron Wong, Ms. Winnie Lam, Ms. Mavis Mak, Mr. Shino Chan, Mr. Alvin Mak (Department of Geography, HKU)
Ms. Amy Cheung (Department of Geography, CUHK)
Mr. Ho-Yin Yip (School of Life Science, CUHK)
Dr. Jerome Hui & Mr. Franco Au (CUHK)
Dr. Mat Seymour (SBS, HKU)
Dr. Chao Ren (Faculty of Architecture, HKU)
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Mr. Vaughan Swart (HK)
Mrs. Jennifer Williams (SIS, ESF)
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Mr. Chi-Win Wong (RVD)
Mr. Lee Chun Ho & Mr. Lau Tse Fung (Addify 3D)
Dr. Ronia Sham (WWF-HK)
Dr. Tan Lee Sian (Labway)

Group Visit:
20 staff and students from GoGetters School, Jan 2022
26 staff and students from St. Stephen's Society Ltd, Jul 2022
25 staff and students from Wu Zhi Qiao Charitable Foundation, Aug 2022
12 staff and students from Variety Hong Kong, Aug 2022
50 guests from European Union Office Hong Kong and Macao, Sep 2022
27 staff and students from CUHK, Sep 2022
12 guests from Swire Management Team, Sep 2022
60 staff and students from Faculty of Architecture, HKU, Oct 2022
24 staff members from Department of Geography, HKU, Dec 2022
7 staff and students from HKUGA College, Dec 2022

Workshops/Symposium:
27 May 2022
Hong Kong's First Oyster Hatchery Kick Off Meeting
17 Aug 2022
Collaborative Workshop with AFCD
17 Oct 2022
CRF – MarineGEO Collaboration Meeting

First collaborative workshop with AFCD at SWIMS

Student Graduations

Ph.D

Chandra Rajan, Kanmani - Oyster biomineralisation in acidifying oceans - from genes to shells

Cheung, Wai Yin - Physiological responses and ecosystem functions of key subtidal primary producer under local and global changes

Dytnerski, James Konrad - Can a keystone tropical urchin maintain its ecosystem function under ocean warming?

Hau, Cheuk Yu - Outcomes, challenges and novel enforcement solutions following the 2004 cites appendix II listing of the humphead (=Napoleon) wrasse, *Cheilinus undulatus* (order Perciformes; family Labridae)

Jimenez, Pedro Juliao - Does thermal physiology shape the local and biogeographical distribtuion of intertidal invertebrates? A case study with brachyuran crabs

Lim, Yong Kian - Epigenetic-associated phenotypic plasticity in the edible oyster under ocean acidification

Yan, Wa Tat - A feasibility study on pearl oyster cultivation in mariculture zones in Hong Kong

M.Phil

Ramirez Calero, Sandra Patricia - Neuromolecular signatures of fish social interactions under normal and climate change conditions

Acknowledgements

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Prof. Gong Peng, Vice-President and Pro-Vice-Chancellor, HKU
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Prof. Max Shen, Vice-President and Pro-Vice-Chancellor, HKU
Ms. Jeannie Tsang , Registrar , HKU
Prof. VWW Yam and Prof. Qiang Zhou and staff, Faculty of Science, HKU
Prof. Alice Wong and staff, School of Biological Sciences, HKU
Mr. KL Tam, Director, Estates Office, HKU
Ms. Eva Tam and staff, Estates Office, HKU
Mr. John Sung and staff, Estates Office, HKU
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Dr. Paul Hunt and staff, Safety Office, HKU
Mr. Tony Lo and staff, Finance and Enterprises Office, HKU
Ms. Janet Chung and Ms. Monica Wong and staff, Development and Alumni Affairs Office, HKU
Mr. Paul Lee and staff, Communication and Public Affairs Office, HKU
Ms. Isabella Wong and Ms. Winnie Lai, Mainland Affairs Office, HKU
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Mr. Alan Chan, AFCD
Ms. Maisie Cheng, Director, EPD
Mr. Cheng and staff, PCCW Cape d'Aguilar Station

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