THE WINNING FORMULA: WHAT MAKES A TRAILBLAZING SCIENTIST?
Learning from the Best of the Best

This Faculty Newsletter issue allows us to learn from the best of the best. We have had four Faculty members elected as members of the Chinese Academy of Sciences (CAS) in the past years, one of the most prestigious honours in the Science arena. In this issue, we are fortunate to have all four of them share with us their thoughts on how science comes to fruition.

Science discoveries leave us in awe while pushing the technological frontiers forward. From their stories, we realise that scientific results do not come easy and roadblocks take sweat and tears to overcome. How can one expect to triumph over setbacks without devotion to knowledge generation? One first has to take risks and be not afraid of greatness to create a new research field from ground zero. Having faith in oneself will ultimately lead to the formulation of an innovative theory toward the grand goal of seeking the truth. Most importantly, the path of pursuit of new knowledge does not end. Instead, the road branches off into trailblazing paths, with some leading to unexpected outcomes while some bridging real-life technology gaps. The excitement and commitment displayed by our four grandmasters will hopefully ignite the passion in our readers to appreciate the beauty of fundamental science.

Our Science Faculty members do not settle for less. I am thrilled to share the joy that Professor Ngaiming MOK has been awarded the 2022 Future Science Prize in Mathematics and Computer Science and the Chern Prize. I am also proud to let readers know that Professor Vivian Wing-Wah YAM has received the Silver Bauhinia Star and the InnoStars Award 2021. Professor Zheng Xiao GUO secured over HKD 40 million of theme-based research scheme from the Research Grants Council (RGC) to realise a sustainable society through achieving carbon neutrality. I welcome you all to read this issue to learn more about the full list of external accomplishments and funding obtained by our Faculty of Science professors. Congratulations!

Let us take a sneak peek at what else this issue has to offer beyond accolades and honours. This issue covers news on our research about the global ants census that attracted international media coverage, as well as a HKU startup selected as one of the Forbes Asia 100 to Watch. Research stories cover topics ranging from forest restoration simulation to quantum materials and cancer cell cross-talks to anti-COVID drugs.

Last and most importantly, my heartfelt thanks to our interim Dean of Science, Professor Vivian Wing-Wah Yam, for leading the Faculty of Science to great heights in the past year! I wish Professor Yam all the best in her research endeavours. You can learn more about Professor Qiang ZHOU, the new Dean of the Faculty of Science, in this issue of the Faculty Newsletter. Join me and welcome our new Dean on board!

Yours sincerely,
Dr Edmund Chun Ming TSE
Chief Editor
Assistant Professor, Department of Chemistry
New Dean on Board –
Steering the Faculty in Times of Change

Professor Qiang ZHOU
Dean of Science
Chair Professor, School of Biological Sciences

Before joining HKU Science, Professor Zhou was a Professor of Biochemistry, Biophysics and Structural Biology in the Department of Molecular and Cell Biology at the University of California, Berkeley. He received his PhD from the University of California, Los Angeles in 1992. Between 1993 and 1996, he conducted postdoctoral research in the laboratory of Nobel Laureate Phillip Sharp at the Massachusetts Institute of Technology. He started his academic career at UC Berkeley in 1997, where he rose through the academic ranks to full professorship in 2007.

As a world-renowned scholar, Professor Zhou has a keen research interest revolving around investigating viral-host interactions at the molecular level. His research discoveries, published in top journals and regarded by peers as major breakthroughs with significant and long-lasting impact, have led to the identification and characterisation of a multitude of human proteins that control human host and HIV gene expression. Professor Zhou is also a well-recognised educator. Among the PhD students and the postdocs he has mentored, many now hold independent academic positions in universities worldwide (including UC Berkeley, Harvard Medical School, etc.), or leadership positions in the biotech/pharmaceutical industry.

Professor Zhou has active and extensive international networks both in academia and industry. He had been a Charter Member of the NIH AIDS Molecular and Cellular Biology (AMCB) Study Section and served as an organiser of international symposiums held in the US, Europe, and Asia. He has been serving on the editorial board of Cell & Bioscience since 2010 and was a scientific consultant to Novartis and Fochon Pharmaceuticals. He directed the Tang Distinguished Scholarship Program, bringing in many highly qualified scholars to UC Berkeley over the years.

While welcoming our new Dean, we would also like to extend our gratitude to Professor Vivian Wing-Wah YAM for her committed stewardship of the Faculty as the Interim Dean during the transition period.

The modern world is evolving at an unparalleled rate, and so must the scientific community. In the face of today’s unprecedented challenges, we need leaders who can inspire innovative solutions, impact society, and launch the Faculty into the future. We are pleased to announce Professor Qiang Zhou as the new Dean of Science and Chair Professor of the School of Biological Sciences. Professor Zhou has just been on board this November.

Our world would not exist in its present form without scientific research, which made scientists especially important for our society.

But what makes a successful scientist? This is a question often raised by people who are pursuing a career in the scientific field.

In this issue, four members of the Chinese Academy of Sciences (CAS) at HKU Science will share with us the paths of their scientific journeys, valuable research experiences, and youth experiences that shaped them to who they are today.

Listen to their stories, learn from their experience and start your own fruitful adventure! 
Cancer, one of the leading causes of death worldwide, accounted for about one in six deaths in 2020. Despite modern medical advancements, finding a definite cure for cancer is still hard, not to mention suitable treatment without bringing severe side effects. This gap in progress is why Professor Chi-Ming Che dedicates his time to New Anti-Cancer Metal Targeted Chemotherapy and Traditional Chinese Medicine (TCM) research in the hope of finding a way to eradicate all cancer cells that metastasize into the patient’s body with minimal unwanted effects on patients’ systems and health conditions.

Professor Che enrolled in the physical science stream (Physics, Chemistry & Mathematics) at The University of Hong Kong in 1975 and chose Chemistry as his Major. The eminent chemist of today was not encouraged by his teacher at the time. ‘I was always the last one who finished the classwork. My classmates also attributed this to my personality – I am not the kind of person who tracks a single idea. But it is also attributed to my personality – I am not the kind of person who tracks a bunch of habits at a time. This allows me to concentrate on conducting research. Having too many hobbies would inevitably deter one from pursuing knowledge in the laboratory. As a scientist, you have to take Science as part of your life: this is my philosophy and what I do.’

From Synthesis to Pharmacy

2003 is a watershed year. Before that, Professor Che’s research interests were focused more on fundamental topics, such as chemical synthesis, photochemistry and excited state dynamics. In 2003, here came the turning point – Professor Che received funding from the University Grants Committee under the Areas of Excellence Scheme (AoE) that opened up another opportunity for his research path. He used this opportunity to set up an Open Laboratory of Chemical Biology for the AoE programme, focusing on pharmaceutical research. Being the coordinator of the AoE project, ‘Institute of Molecular Technology for Drug Discovery & Synthesis’, he broadened his research from synthetic chemistry to pharmaceutical and drug discovery.

Not long afterward, Professor Che was offered a chance to explore Traditional Chinese Medicine (TCM), while working on a project outsourced by the Government’s Department of Health about TCM analysis and identification. This experience opened the doors for him to explore using TCM as a core component in treating cancer.

Developing TCM as a Cancer Treatment

There are around three main types of cancer treatments to date, besides surgery and precision radiotherapy: chemotherapy, targeted therapy, and immunotherapy. The current clinical used chemotherapy drugs cannot prevent relapses in final-stage patients. On the other hand, targeted therapy normally suppresses proliferation of cancer cells rather than eliminating them. When targeted therapy drugs fail to work, immunotherapy is used to treat cancers.

In the treatment of stage IV lung cancer where targeted therapy and immunotherapy alone become ineffective, a combination of immunotherapeutic drugs, an anti-angiogenesis drug and two chemotherapeutic drugs is used for the treatment. However, the clinically used chemotherapeutic drugs are highly toxic but are not quite effective against the cancer stem cells and metastatic cancer cells. In addition, cancer is a complex disease. It is forecasted that simply based on immunotherapy and targeted therapy is less likely to provide a definite cure for the cancer patients in the advanced, late stages in the next 10 to 15 years? Professor Che said.

His goal is to contribute to turning advanced cancer into a treatable chronic disease, and hence, he began to study TCM, and hoping it will help cancer patients to take it on a long-term basis without harming their bodies.

‘It is a formidable challenge for synthetic drugs to achieve this because of drug resistance and the complexity of cancers. Chinese medicine itself is a cocktail treatment. The Chinese herbal compound can enhance the immune capacity, effectively block tumor angiogenesis, and be used in the long term without common side effects,’ said Professor Che.

Professor Che’s laboratory has been studying TCM in order to achieve this outcome. His recent findings revealed that the TCM under his investigation is effective in treating both breast and lung cancers. His team is carrying on the study to evaluate its efficacy and in launching clinical trials study. Professor Che is also working on new platinum targeted chemotherapy with higher efficacy and safety. He is pushing the new platinum targeted chemotherapy to enter into clinical trials in the next two to three years. ‘I hope I can successfully develop an anti-cancer drug that can treat metastatic cancer with minimal side effects, or at least enable the patients not to relapse in five or six years,’ he said.
The search for beauty and benevolence that binds truth-seekers in mathematics across generations will continue to enable the flourishing of mathematics.

The Beauty of the Truth-seeking Process in Mathematics

Professor Ngaiming MOK
Edmund and Peggy Tse Professor in Mathematics and Chair Professor of the Department of Mathematics

Research interests: Several Complex Variables, Complex Differential Geometry, Algebraic Geometry, Arithmetic Geometry

Research achievements: Professor Mok has received several major mathematical problems, including his solution in 1988 of the Generalized Frankel Conjecture, his solution in 1999 of the Lazarsfeld Problem with Professor Jun-Muk Hwang at KIAS, his solution in 2012 with Dr Sui-Chung Ng at HKU of a problem of Clozel and Ullmo in Arithmetic Dynamics on bounded symmetric domains, and his solution in 2019 of the Ax-Schanuel Conjecture on Shimura varieties with Professor Jonathan Pila at Oxford and Professor Jacob Tsimerman at U. Toronto.

Selected Awards and Achievements
- 2022: Future Science Prize in Mathematics and Computer Science
- 2022: The Chern Prize in Mathematics, ICMS
- 2019: Fellow of the American Mathematical Society
- 2013: Member of the Hong Kong Academy of Sciences
- 2011: Fellow of the Academy of Mathematics and Systems Science, CAS
- 2010: Distinguished Research Achievement Award (DRA)
- 2009: Bergman Prize, the American Mathematical Society
- 2007: Shaw Natural Science Award, China
- 1998: Croucher Senior Research Fellow

Research interests:
- Several Complex Variables
- Complex Differential Geometry
- Algebraic Geometry
- Arithmetic Geometry

Research achievements:
- Solution of the Generalized Frankel Conjecture in 1988
- Solution of the Lazarsfeld Problem in 1999 with Professor Jun-Muk Hwang at KIAS
- Solution of a problem of Clozel and Ullmo in Arithmetic Dynamics in 2012 with Dr Sui-Chung Ng at HKU
- Solution of the Ax-Schanuel Conjecture in 2019 with Professor Jonathan Pila at Oxford and Professor Jacob Tsimerman at U. Toronto

He also reiterated that we can always gain inspirational ideas when we listen and learn from others. In the meantime, meeting and chatting with people from different backgrounds, academically, culturally, and ethnically, can amaze us serendipitously. ‘They just make you feel like you are not doing research but developing a long-term friendship and a social circle that can offer you countless happiness and unforgettable moments in your life,’ he added. ‘Therefore, I always encourage students to socialise more with others,’ said Professor Mok.

Developing a passion for truth

I went to the library, I would search for books that were filled with fascinating contents, particularly those related to mathematics. Reading has cultivated his enthusiasm and enriched his mathematical knowledge. ‘It has long been the impetus which spurs me to be a mathematician,’ added Professor Mok, agreeing that he has to attribute his academic accomplishments to reading.

Apart from mathematics, he is also an enthusiast of linguistics. He can speak seven languages, including Cantonese, Mandarin, English, French, Italian, German and Japanese, and, with the obvious exceptions and German, he masters these languages all by self-learning.

His communicative competence is one of the key factors fostering his success in academic. ‘One of the essential things about scientific research is to learn and assimilate knowledge from various angles. During his time in academic research, Professor Mok always develops a close connection with fellow mathematicians across the globe. He often chats with them in different languages.

As a renowned mathematician, Professor Mok is well-known in the mathematical community for his global perspective on pure mathematics and for having solved a series of important conjectures and problems using a combination of analytic, algebraic and geometric methods.

His contributions brought him numerous prestigious honours along his scientific journey. 2022 is certainly a good harvest year for him as he was awarded the Chern Prize in Mathematics at the International Congress of Chinese Mathematicians, as well as the 2022 Future Science Prize in Mathematics and Computer Science, also known as China’s Nobel Prize, which aims at recognising scientific breakthroughs and innovations in the Greater China Region. It is a well-deserved award for his exceptional contributions to promoting the development of mathematics and computer science-related basic research in the Greater China region.

Some say mathematicians are introverts, but his journey of curiosity led him to explore the world. After completing his PhD at Stanford University in 1980, he embarked on his exciting research career in mathematics at Princeton University, Columbia University and University of Paris. Finally, in 1994, he returned to Hong Kong and took up the role of the Chair Professor at the Department of Mathematics of HKU.

From a magnificent book lover to an accomplished mathematician

Talking about what opened his door to mathematics, Professor Mok provided a certain answer – books. Back in the old days, the City Hall Library was his favourite spot in his spare time as a student. ‘You can always find something interesting and intriguing in books. Whenever I went to the library, I would search for books that were filled with fascinating contents, particularly those related to mathematics.’ Reading has cultivated his enthusiasm and enriched his mathematical knowledge. ‘It has long been the impetus which spurs me to be a mathematician,’ added Professor Mok, agreeing that he has to attribute his academic accomplishments to reading.

Some people may think research-related work is tedious, but Professor Ngaiming Mok holds a different view. In his opinion, mathematics is not just about numbers and calculation but can be integrated into various theories and other aspects of life, ‘It’s a journey in search of beauty and benevolence,’ said Professor Mok with a charming smile.

As a renowned mathematician, Professor Mok is well-known in the mathematical community for his global perspective on pure mathematics and for having solved a series of important conjectures and problems using a combination of analytic, algebraic and geometric methods.

His contributions brought him numerous prestigious honours along his scientific journey. 2022 is certainly a good harvest year for him as he was awarded the Chern Prize in Mathematics at the International Congress of Chinese Mathematicians, as well as the 2022 Future Science Prize in Mathematics and Computer Science, also known as China’s Nobel Prize, which aims at recognising scientific breakthroughs and innovations in the Greater China Region. It is a well-deserved award for his exceptional contributions to promoting the development of mathematics and computer science-related basic research in the Greater China region.

Some say mathematicians are introverts, but his journey of curiosity led him to explore the world. After completing his PhD at Stanford University in 1980, he embarked on his exciting research career in mathematics at Princeton University, Columbia University and University of Paris. Finally, in 1994, he returned to Hong Kong and took up the role of the Chair Professor at the Department of Mathematics of HKU.

From a magnificent book lover to an accomplished mathematician

Talking about what opened his door to mathematics, Professor Mok provided a certain answer – books. Back in the old days, the City Hall Library was his favourite spot in his spare time as a student. ‘You can always find something interesting and intriguing in books. Whenever I went to the library, I would search for books that were filled with fascinating contents, particularly those related to mathematics.’ Reading has cultivated his enthusiasm and enriched his mathematical knowledge. ‘It has long been the impetus which spurs me to be a mathematician,’ added Professor Mok, agreeing that he has to attribute his academic accomplishments to reading.

Apart from mathematics, he is also an enthusiast of linguistics. He can speak seven languages, including Cantonese, Mandarin, English, French, Italian, German and Japanese, and, with the obvious exceptions and German, he masters these languages all by self-learning.

His communicative competence is one of the key factors fostering his success in academic. ‘One of the essential things about scientific research is to learn and assimilate knowledge from various angles. During his time in academic research, Professor Mok always develops a close connection with fellow mathematicians across the globe. He often chats with them in different languages.

As a renowned mathematician, Professor Mok is well-known in the mathematical community for his global perspective on pure mathematics and for having solved a series of important conjectures and problems using a combination of analytic, algebraic and geometric methods.

His contributions brought him numerous prestigious honours along his scientific journey. 2022 is certainly a good harvest year for him as he was awarded the Chern Prize in Mathematics at the International Congress of Chinese Mathematicians, as well as the 2022 Future Science Prize in Mathematics and Computer Science, also known as China’s Nobel Prize, which aims at recognising scientific breakthroughs and innovations in the Greater China Region. It is a well-deserved award for his exceptional contributions to promoting the development of mathematics and computer science-related basic research in the Greater China region.

Some say mathematicians are introverts, but his journey of curiosity led him to explore the world. After completing his PhD at Stanford University in 1980, he embarked on his exciting research career in mathematics at Princeton University, Columbia University and University of Paris. Finally, in 1994, he returned to Hong Kong and took up the role of the Chair Professor at the Department of Mathematics of HKU.

From a magnificent book lover to an accomplished mathematician

Talking about what opened his door to mathematics, Professor Mok provided a certain answer – books. Back in the old days, the City Hall Library was his favourite spot in his spare time as a student. ‘You can always find something interesting and intriguing in books. Whenever
If you are passionate, dedicated, and believe in yourself, you can excel at anything.

Let Passion Blaze in Your Pursuits

Professor Vivian Wing-Wah YAM

Philip Wong Wilson Wong Professor in Chemistry and Energy
Chair Professor of Chemistry

Research interests: Inorganic and Organometallic Chemistry, Supramolecular Chemistry, Photophysics, and Photochemistry

Molecular Functional Materials for Optoelectronic and Solar Energy Conversion, etc.

Research achievements: Molecular design and spectroscopic studies of luminescent molecular functional materials and supramolecular assemblies, particularly in the manipulation and harnessing of excited states for light-enabled technologies and functions.

What makes a great scientist and influencer? Since she was a child, Professor Vivian Wing-Wah YAM has been contemplating the connection between science and nature. Back in primary school, she observed the liquid state of mercury from a broken thermometer and was fascinated by how unique it was compared to other metals. This led to her lifelong passion for chemistry. "I have always been observant and tend to see things objectively. As a scientist, this has been very useful for my research," Professor YAM noted.

Professor YAM values creativity in chemistry, as it allows her to experiment with new molecules and better understand the functions of existing ones. As a central science, chemistry forms a very good foundation for applying to other fields, for example, one can work at the interface of chemistry, physics, and engineering to develop new materials to combat environmental and energy-related issues, she explained. She also mentioned the close connection between chemistry, biology, and medicine for developing new drugs, vaccines, and diagnostic tools for biomedical applications.

Born and raised in Hong Kong, Professor YAM attended an Anglican grammar school, where she began to develop her curiosity about the natural world. As a gifted learner, she could excel in areas that pushed her analytical skills, which encouraged her to pursue science. "When I was at secondary school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importance of taking on the ownership, while enjoying with full commitment and dedication to everything you choose to do in life," she said. Years later, she graduated from Chemistry school, I developed a strong sense of feeling for the need to value and respect one's own doing and work, the importan
Science as a Painstaking Process

Professor Guochun ZHAO
Chair Professor, Department of Earth Sciences

Research interests: Metamorphic Petrology, Precambrian Geology and Supercontinents

Research achievements: Discoveries of two 1.95-1.85 billion years old continental collisional belts in North China, recognition of global-scale 2.8-1.8 Ga collisional events leading to the assembly of a supercontinent and a new reconstruction of East Asian continental blocks in supercontinent Pangaea.

For decades, eminent Earth Scientist Professor Guochun Zhao has dedicated himself to researching plate tectonics and supercontinents. His inimitable research has unraveled the fundamental yet unsolved conundrums regarding when plate tectonics began to shape the Earth’s surface. It has also revealed how the continental blocks have periodically assembled into supercontinents and subsequently disassembled throughout the Earth’s history.

It was a drizzling day when Professor Zhao met us at the Stephen Hui Geological Museum for a portrait session. Suddenly, he got excited when spotting a panel poster explaining Precambrian geology, and he told us it is one of the focal areas that his research interest lies. That marked the beginning of our interview, followed by chatter and laughter that centred around his challenging yet fulfilling research journey.

Despite the wet and chill weather outside, the burning passion in his eyes was too noticeable to be neglected.

From a serendipitous start to a pioneering career

So, how did you become a researcher in the first place? Thinking the story was such a cliché to tell, this question put a smile on the amiable gentleman’s face. Growing up in a rural area in Liaoning, Professor Zhao had long been captivated by the peculiar textures and colours of rocks that one could find everywhere. His interest grew when observing the intriguing fieldwork of the national geology team in his village. His childhood encounters might have been inspiring, but it was not until the day of submitting his university application that teenager Professor Zhao chose to pursue geology.

Here the fun tale goes: while vacillating among myriad university choices, Professor Zhao bumped into a geology team member who swayed him to the benefits of studying geology – getting a plum job and a well-made marriage upon graduation. Dubious about the joke, the young man nevertheless joined the geological department. This casual remark became specious, and he later found that the decision was seminal to his research career. It all changed after attending his first lecture on introductory geology – he was fascinated by the broad scope of geological study ranging from the gargantuan celestials in the universe to the minuscule minerals on Earth. From that lesson, geology was no longer a synonym for rapid mining work to him. Driven by his burgeoning interests, he often immersed himself in the library, delving deeply into the world of rocks and minerals. Eventually, geology became his life-long career – this fortuitous chance to study geology uncovered the enthusiasm of the talented scientist.

Success does not come easy. It is not surprising that the early stages of a scientific career are fraught with many difficulties. Professor Zhao shared his experience of surmounting obstacles in his early years. He recalled during his PhD study at Curtin University in Australia, he was stumbled upon his rejected paper which he had spent two years on, as experts cast doubts on his bold proposition on a supercontinent that was assembled about 1.8 billion years ago. It took him years to revise the research, glean more evidence and corroborate his theory further, after which the journal paper has become a significant reference in the field of supercontinents. ‘Had it not been the tenacity, I would not have accomplished these research findings,’ said the esteemed professor in a hortatory tone.

Soon after completing his PhD, Zhao joined HKU as a postdoctoral fellow in 2000, and it has been more than twenty years since then. He has forged a tight bond with the University, mainly due to the HKU’s and Faculty’s full support of his research projects and initiatives, especially in building connections and fostering international collaborations. ‘As a research-oriented university, HKU has been a good incubation hub for generations of scientists. I am thankful for the ample opportunities all these years,’ Professor Zhao remarked. The active minds of scientists never stop: Professor Zhao recently wants to explore issues of what had happened before plate tectonics started on our planet – pre-plate tectonics and its bearings on the origination of continents. He is preparing to establish an institute of pre-plate tectonics and origin of continents on the HKU Shenzhen campus. As understanding the early Earth is the main purpose of this proposed institute, we envisage Professor Zhao would tell us more in the future.

Becoming erudite through extensive reading

Continuing with his story, Professor Zhao shared his views about becoming an outstanding geologist. He noted that the rewards of earth science research are contingent on the efforts paid rather than one’s smartness or serendipity. ‘The efforts are inevitably painstaking, and success always comes after dedication and struggles,’ said Professor Zhao, firmly and implacably. He also indicated two essential keys for researchers to succeed: interest and perseverance — one should follow their interests and strive to solve potential problems. When it comes to the practical aspects, he thought extensive reading makes experts; one could acquire knowledge through reading and address various scientific questions around us.

For a distinguished researcher like Professor Zhao, becoming erudite through extensive reading is almost a must. ‘Reading is my bread and butter,’ he said. For decades, he has learned from reading books and journals to keep abreast of the latest research findings in the field of geology. ‘I have always read books that I have not studied before, so I can always learn something new from them.’ With a passion for reading, Professor Zhao has set up an extensive personal library, which he often consults when he is not in the laboratory. ‘I want to keep myself updated with the latest research in my field, and reading is the best way to do it.’

In conclusion, becoming a successful researcher requires dedication, perseverance, and a love for reading. Professor Zhao’s story is a testament to the importance of these qualities in the field of geology. His journey is an inspiration to all aspiring scientists, reminding us that with hard work and passion, anything is possible. As he once said, ‘The efforts are inevitably painstaking, and success always comes after dedication and struggles. I am thankful for the ample opportunities all these years, Professor Zhao remarked. The active minds of scientists never stop: Professor Zhao recently wants to explore issues of what had happened before plate tectonics started on our planet – pre-plate tectonics and its bearings on the origination of continents. He is preparing to establish an institute of pre-plate tectonics and origin of continents on the HKU Shenzhen campus. As understanding the early Earth is the main purpose of this proposed institute, we envisage Professor Zhao would tell us more in the future.’
Our Earth Scientists Simulated the Future: The Restored Forests Will Grow Strong and Survive!

Forest restoration is a nature-based solution that removes carbon dioxide from the atmosphere, yet whether restored forests can withstand the impacts of future climate change has long been uncertain. To ensure previous efforts would not be wasted, our Earth Scientists performed hundreds of computer simulations with a dynamic global vegetation model, concluding that it is hopeful tropical forests restored today will survive until the end of the century.

Evolution Speed is Key to Marine Survival

Botanists Cracked the Code of How Guard Cell Chloroplasts Obtain Energy

The Science Behind

Restoring all potential tropical forest areas is likely not feasible; hence, targeting and prioritizing forest restoration is needed. Although forest is an effective and natural solution to combat climate change, it is not feasible to restore all tropical forest areas to counteract the impacts of climate change. Therefore, prioritizing and targeting forest restoration is crucial to ensure the survival of restored forests in the future.
Breaking the Crosstalk between Cancer Cells and Immune Cells May Help in Reducing the Spread of Ovarian Cancer

Researchers // Professor Alice Sue Taii WONG and Postdoctoral Fellow Dr Sally Kit Yan TO

The team discovered that orally administrated bismuth drug colloidal bismuth subcitrate (CBS) together with N-acetyl cysteine (NAC) could be a broad-spectrum anti-coronavirus cocktail therapy. Bismuth could subsequently suppress virus replication of a panel of clinically relevant coronaviruses by inactivating multiple essential viral enzymes.

Further molecular analyses suggested that 'β-catenin signalling' upregulates cancer cell surface metadherin, which communicates through CEA/CA15, expressed by macrophages, thus turning metastatic cells into polyploid; causing cancer cells to spread.

Learn more: https://bit.ly/3AgCBRV

NAC can stabilise bismuth-containing metallodrugs at stomach-like conditions and enhance the uptake of bismuth drugs in tissues and antiviral potency through oral administration.

Learn more: https://bit.ly/3R5oru1

Physicists Make a Stride Closer in the Quest for Quantum Materials

Researchers // Associate Professor Dr Zi Yang MENG, PhD student Mr Jianrui ZHAO and Postdoctoral Fellow Dr Zheng YAN of Department of Physics.

The research team developed a new and more efficient quantum algorithm to measure the entanglement entropy of objects. With this new tool, they measured the entanglement entropy at the Deconfined Quantum Critical Points (DQCP), a state that cannot be measured by the traditional method, and found the scaling behaviour of the entropy, advancing the exploration of more comprehensive laws in quantum mechanics and moving closer towards the actualisation of application of quantum materials.

Quantum entanglement is the property of particles that are entangled with each other in a quantum system. By studying quantum entanglement, physicists can better look at quantum phase transitions, which could help to find quantum materials for practical applications, such as building super quantum computers.

Learn more: https://bit.ly/3R5oru1

Chemistry

Discovery of a New Broad-spectrum Oral Anti-Covid Drug

Researchers // Chair Professor Hongzhao SUN, Postdoctoral Fellow Dr Running WANG, and PhD student Miss Siye WANG of Department of Chemistry

The team used single-cell time-lapse microscopy to observe cellular behavior and revealed that in the presence of macrophages, a subset of the metastatic cells seems to survive better, which could promote tumour aggressiveness and therapeutic resistance.

The team found that blocking tumour aggressiveness and therapeutic resistance.

Further molecular analyses suggested that 'β-catenin signalling' upregulates cancer cell surface metadherin, which communicates through CEA/CA15, expressed by macrophages, thus turning metastatic cells into polyploid; causing cancer cells to spread.

The research team discovered that orally administrated bismuth drug colloidal bismuth subcitrate (CBS) together with N-acetyl cysteine (NAC) could be a broad-spectrum anti-coronavirus cocktail therapy. Bismuth could subsequently suppress virus replication of a panel of clinically relevant coronaviruses by inactivating multiple essential viral enzymes.

Further molecular analyses suggested that 'β-catenin signalling' upregulates cancer cell surface metadherin, which communicates through CEA/CA15, expressed by macrophages, thus turning metastatic cells into polyploid; causing cancer cells to spread.

The team used single-cell time-lapse microscopy to observe cellular behavior and revealed that in the presence of macrophages, a subset of the metastatic cells seems to survive better, which could promote tumour aggressiveness and therapeutic resistance.

The team discovered that orally administrated bismuth drug colloidal bismuth subcitrate (CBS) together with N-acetyl cysteine (NAC) could be a broad-spectrum anti-coronavirus cocktail therapy. Bismuth could subsequently suppress virus replication of a panel of clinically relevant coronaviruses by inactivating multiple essential viral enzymes.

Further molecular analyses suggested that 'β-catenin signalling' upregulates cancer cell surface metadherin, which communicates through CEA/CA15, expressed by macrophages, thus turning metastatic cells into polyploid; causing cancer cells to spread.

The team used single-cell time-lapse microscopy to observe cellular behavior and revealed that in the presence of macrophages, a subset of the metastatic cells seems to survive better, which could promote tumour aggressiveness and therapeutic resistance.

The team discovered that orally administrated bismuth drug colloidal bismuth subcitrate (CBS) together with N-acetyl cysteine (NAC) could be a broad-spectrum anti-coronavirus cocktail therapy. Bismuth could subsequently suppress virus replication of a panel of clinically relevant coronaviruses by inactivating multiple essential viral enzymes.

Further molecular analyses suggested that 'β-catenin signalling' upregulates cancer cell surface metadherin, which communicates through CEA/CA15, expressed by macrophages, thus turning metastatic cells into polyploid; causing cancer cells to spread.

The team used single-cell time-lapse microscopy to observe cellular behavior and revealed that in the presence of macrophages, a subset of the metastatic cells seems to survive better, which could promote tumour aggressiveness and therapeutic resistance.
Efficient Sampling Algorithms for Manipulating Light in Photonic Crystals

Researchers // Dr Guanglian LI and PhD student Yueqi WANG of Department of Mathematics
Collaborator // Imperial College London, UK

Photonic crystals (PCs) are highly structured materials, in which, electromagnetic waves propagating in them can interfere with each other such that certain frequency ranges cannot propagate in the PCs. This prohibited range, called band gap, can be utilised to design many practical devices such as low-loss optical mirrors and zero-threshold lasers. However, the calculation of the band gaps is very time-consuming.

The team applied research tools such as multiscale analysis, sampling theories, approximation theory, partial differential equations, and finite element methods to develop efficient numerical algorithms to estimate these band gaps, which will reduce production costs and increase device accuracy.

Q&A in Science — Our First Video Programme Hosted by Animated Mascot

A s the host of this funny Science video programme, Currio, our Science Mascot, will present you with some cutting-edge scientific research conducted by our researchers, informing how these research projects could be integrated into daily life.

![Image](https://example.com/currio.png)

Let’s get down Currio 嘿，快來一同緊跟最新趨勢！

Songbirds like it Sweet!雀鳥愛吃甜—關人咩事！

Home and Hub

Wildlife trade consequences of Toxay gekkos in Hong Kong

Research Story: The Geckos’ Calling

Ecologists from HKU Conservation Forensics Lab and School of Biological Sciences found evidence that pet and medicine trades brought Toxay gekkos from across Asia into Hong Kong. Featuring Toxay gekkos in this video, the team even recorded a special song ‘performed’ by them, hoping to raise concerns about the preservation of this reptile species.

Introduction of Food & Nutritional Science Major

The Food and Nutritional Science Major of BSc programme at HKU Science, aims to offer an exciting, dynamic and challenging environment for students to prepare their career opportunities in food and nutritional science. Our Lead Curriculum Coordinator Dr Jetty LEE will tell you how this programme will equip you for the challenges at the workplace.

Q&A in Science — Our First Video Programme Hosted by Animated Mascot

As the host of this funny Science video programme, Currio, our Science Mascot, will present you with some cutting-edge scientific research conducted by our researchers, informing how these research projects could be integrated into daily life.

![Image](https://example.com/currio.png)

Let’s get down Currio 嘿，快來一同緊跟最新趨勢！

Songbirds like it Sweet!雀鳥愛吃甜—關人咩事！

Home and Hub

Wildlife trade consequences of Toxay gekkos in Hong Kong

Research Story: The Geckos’ Calling

Ecologists from HKU Conservation Forensics Lab and School of Biological Sciences found evidence that pet and medicine trades brought Toxay gekkos from across Asia into Hong Kong. Featuring Toxay gekkos in this video, the team even recorded a special song ‘performed’ by them, hoping to raise concerns about the preservation of this reptile species.

Introduction of Food & Nutritional Science Major

The Food and Nutritional Science Major of BSc programme at HKU Science, aims to offer an exciting, dynamic and challenging environment for students to prepare their career opportunities in food and nutritional science. Our Lead Curriculum Coordinator Dr Jetty LEE will tell you how this programme will equip you for the challenges at the workplace.

Q&A in Science — Our First Video Programme Hosted by Animated Mascot

As the host of this funny Science video programme, Currio, our Science Mascot, will present you with some cutting-edge scientific research conducted by our researchers, informing how these research projects could be integrated into daily life.

![Image](https://example.com/currio.png)

Let’s get down Currio 嘿，快來一同緊跟最新趨勢！

Songbirds like it Sweet!雀鳥愛吃甜—關人咩事！

Home and Hub

Wildlife trade consequences of Toxay gekkos in Hong Kong

Research Story: The Geckos’ Calling

Ecologists from HKU Conservation Forensics Lab and School of Biological Sciences found evidence that pet and medicine trades brought Toxay gekkos from across Asia into Hong Kong. Featuring Toxay gekkos in this video, the team even recorded a special song ‘performed’ by them, hoping to raise concerns about the preservation of this reptile species.

Introduction of Food & Nutritional Science Major

The Food and Nutritional Science Major of BSc programme at HKU Science, aims to offer an exciting, dynamic and challenging environment for students to prepare their career opportunities in food and nutritional science. Our Lead Curriculum Coordinator Dr Jetty LEE will tell you how this programme will equip you for the challenges at the workplace.
My research focuses on the molecular regulation of photosynthesis and plastid development. As photosynthesis is a fundamental reaction that produces food for most life on our planet, my research is committed to knowing how photosynthesis works and resolving new ways to optimise photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy cooking, outdoor sports and travel. I look forward to exchanging more global warming and climate change. Apart from research, I enjoy photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy cooking, outdoor sports and travel. I look forward to exchanging more global warming and climate change. Apart from research, I enjoy photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy photosynthetic efficiency, ultimately securing food security in the context of global warming and climate change. Apart from research, I enjoy cooking, outdoor sports and travel. I look forward to exchanging more ideas with the talented colleagues and excellent students at HKU.

Dr Peng WANG
Assistant Professor of Department of Biology
Research interests: photosynthesis, plastid development, proteome horizontal, pigment metabolism and plastid adaptation to climate change

I am particularly interested in using the Earth’s ambient vibrations to do CT scans for earthquake faults, sedimentary basins and deep ocean trenches. I am also applying machine learning techniques to denoising seismic data and mining for more information in the modern smart city.

Dr Paolo MOMIGLIANO
Assistant Professor of School of Biological Sciences
Research interests: speciation genomics, genomics of local adaptation, demographic modeling from genetic data, snpscape genomics and conservation genomics of marine fauna

After completing my PhD in Australia, I spent five years in Helsinki before deciding it was time to move to a warmer climate. My research interests lie at the intersection between evolutionary genetics and conservation. I am generally interested in the processes that lead to local adaptation and the evolution of new species, but I tend to work on organisms (fishes and plants) for which the study of evolutionary processes can inform management and conservation in concrete ways. I love scuba diving, trekking, kitesurfing and cooking in my free time.

Dr Yi YANG
Assistant Professor of Department of Physics
Research interests: topological photonics, plasmonics, photonic crystals, free electron optics

I am thrilled to join HKU! I visited HKU several times when my wife studied here in the past. I was mesmerized by its mountainous beauty and did not expect I could come back one day as a Faculty member. My group will work on optical physics and nanophotonics, a research area that deals with light at nanometer scales. I play many sports in my free time like football, basketball and swimming. I am a loyal supporter of Arsenal in the Premier League. I also listen to rock music.

Dr Chun Yin HUI
Assistant Professor of Department of Mathematics

My general research interests lie in the field of machine learning and high-dimensional statistics. In particular, I am currently focusing on developing statistical machine-learning methodologies for medical imaging analysis. Beyond academics, I am passionate about tennis. I look forward to working with all the talented Faculty members and hope to contribute to the Department!

Dr Yan Hei LI
Assistant Lecturer of Department of Earth Sciences
Teaching area: field geology, geological mapping, geochemistry, ocean science and climate change

As a graduate of HKU, I am so glad I got the opportunity to teach here. I am a field geologist, and my goal is to help students to build up solid field skills and experience. I am also researching the behaviour of Rare Earth Elements and other strategic metals in Earth’s surface environment to form world-class ore deposits through geochemical and mineralogical techniques. In my leisure, I like hiking, camping, and outdoor water sports.

Dr Weiran LI
Assistant Professor of Department of Earth Sciences
Curator of Stephen Hui Geological Museum
Research interest: volcanology, petrology, geochronology and thermodynamics

I am delighted to join the Faculty after seven years of study and work in Singapore, and also a year and a half of postdoctoral research in Cambridge, UK. I use multidisciplinary methods to study magmatic processes from the Earth’s interior to the surface, including mantle geochemistry, arc magma generation and evolution, hydrothermal ore formation, and volcanic eruption dynamics and hazards. Besides science, I love arts and am passionate about science outreach.

Dr Long FENG
Assistant Professor of Department of Statistics & Actuarial Science
Research interest: statistical machine learning, image data analysis and high-dimensional statistics

I am particularly interested in using the Earth’s ambient vibrations to do CT scans for earthquake faults, sedimentary basins and deep ocean trenches. I am also applying machine learning techniques to denoising seismic data and mining for more information in the modern smart city.

Dr Weiran LI
Assistant Professor of Department of Earth Sciences
Curator of Stephen Hui Geological Museum
Research interest: volcanology, petrology, geochronology and thermodynamics

I am delighted to join the Faculty after seven years of study and work in Singapore, and also a year and a half of postdoctoral research in Cambridge, UK. I use multidisciplinary methods to study magmatic processes from the Earth’s interior to the surface, including mantle geochemistry, arc magma generation and evolution, hydrothermal ore formation, and volcanic eruption dynamics and hazards. Besides science, I love arts and am passionate about science outreach.

Dr Long FENG
Assistant Professor of Department of Statistics & Actuarial Science
Research interest: statistical machine learning, image data analysis and high-dimensional statistics

I am particularly interested in using the Earth’s ambient vibrations to do CT scans for earthquake faults, sedimentary basins and deep ocean trenches. I am also applying machine learning techniques to denoising seismic data and mining for more information in the modern smart city.
Internal Awards

Professor Quentin PARKER, Director of Laboratory for Space Research and Professor of Department of Physics, and his collaborators were awarded Le Prix Gemini 2022 (the 2022 Gemini Prize) co-organised by La Société astronomique de France (SAF) and Société Française d’Astrophysique (SF2A), for their project ‘Search for and Confirmation of Planetary Nebulae Candidates’.

Professor Angela TONG, Associate Professor of Teaching and Associate Professor of the Department of Chemistry, received the Learning 2021-22 for her remarkable efforts at the Department of Chemistry, received the教学助理奖 2021-22 for her dedication to teaching excellence.

Professor Ngaiming MOK, Edmund and Peggy Tsie Professor in Mathematics and Chair Professor of the Department of Mathematics was awarded the 2022 Future Science Prize in Mathematics and Computer Science in recognition of his exceptional contributions to promoting the development of mathematics and computer science related basic research in the Greater China region. He was also awarded the Chern Prize presented at the 9th International Congress of Chinese Mathematicians (ICCM) for his important contributions to several complex variables and complex differential geometry, leading to solutions to difficult geometric problems on quotients of bounded symmetric domains arising from number theory.

Professor Vivian Wing-Yah YAM was awarded the Silver Bauhinia Star on the 2022 Honours list in recognition of her remarkable achievements and contribution to a wide spectrum of research areas in the chemistry discipline and services to the institution and technology community. She also earned another signature accolade – The InnoStars Award 2021 from Our Hong Kong Foundation, in recognition of her dedications to cutting-edge research that fosters the frontiers of chemistry.

Dr Joseph MICHALSKI, Associate Professor of the Department of Earth Sciences and Deputy Director of the Laboratory for Space Research, was elected as a Fellow of the Geological Society of America in recognition of his efforts in forging novel and paradigm-shifting theories about Mars in the areas of volcanism, climate history, and a potential deep biosphere, as well as mentoring and training young planetary scientists, and his thoughtful leadership of geoscience programmes.

Dr Ka Ho LAW, Lecturer of the Department of Mathematics, was honoured with the Faculty’s Award for Teaching Excellence 2021-22 for his dedication to high-quality teaching.

Miss Hannah Bethany TILLEY, a PhD student of the School of Biological Sciences, was awarded the Faculty’s Excellent Teaching Assistant Award 2021-22 for her enthusiasm in providing teaching support in classes.

Two Research Postgraduates Won the 1st and 2nd Runner-ups in HKU 3MT Competition

PhD student Bovern Suchart ARROMRAK and MPhil Student Ka Hei CHEUNG won the first and second runner-ups, respectively, in HKU Three Minute Thesis (3MT ®) Competition 2022. Revisit their appealing presentations and learn more about bacteria and nano pollution from here: https://youtu.be/ixdsDk7aBXI

Dr Eddy Kwok Fai LAM, Associate Professor of the Department of Statistics and Actuarial Science, together with his team received the Faculty Knowledge Exchange (KE) Award 2022 for their KE project about a comprehensive assessment tool, MD5-HC(HK), which evaluated the health outcomes and care needs of Hong Kong Chinese elders.

Dr Angles TONG, Associate Head (Teaching & Learning) and Associate Professor of Teaching at the Department of Chemistry, received the Faculty’s Award for Teaching Innovations in Enhancing Student Learning 2021-22 for her remarkable efforts in enhancing students’ learning experience.

External Awards and Honours

Professor Vivian Wing-Yah YAM was awarded the 2022 Future Science Prize in Mathematics and Computer Science in recognition of his exceptional contributions to promoting the development of mathematics and computer science related basic research in the Greater China region. He was also awarded the Chern Prize presented at the 9th International Congress of Chinese Mathematicians (ICCM) for his important contributions to several complex variables and complex differential geometry, leading to solutions to difficult geometric problems on quotients of bounded symmetric domains arising from number theory.

Dr Joseph MICHALSKI, Associate Professor of the Department of Earth Sciences and Deputy Director of the Laboratory for Space Research, was elected as a Fellow of the Geological Society of America 2022 in recognition of his efforts in forging novel and paradigm-shifting theories about Mars in the areas of volcanism, climate history, and a potential deep biosphere, as well as mentoring and training young planetary scientists, and his thoughtful leadership of geoscience programmes.

Dr Ka Ho LAW, Lecturer of the Department of Mathematics, was honoured with the Faculty’s Award for Teaching Excellence 2021-22 for his dedication to high-quality teaching.

Miss Hannah Bethany TILLEY, a PhD student of the School of Biological Sciences, was awarded the Faculty’s Excellent Teaching Assistant Award 2021-22 for her enthusiasm in providing teaching support in classes.

Faculty’s Award for Outstanding Professional Services Staff (2021-22) went to Miss Eva Wu Ching TAM, Senior Clerk of the School of Biological Sciences, for her contribution to various areas, including all undergraduate matters and administrative works of the teaching programmes.

Miss Hannah Bethany TILLEY

Miss Hannah Bethany TILLEY

PhD student Won Third Place in the Langmuir Best Oral Presentation Award

Dengping LYU, PhD student of HKU Chemistry, won third place in the Langmuir Best Oral Presentation Award at the 96th ACS Colloid and Surface Symposium. Dengping demonstrated the synthesis of a new type of low-symmetry, anisotropic particles, which paves the way for creating functional materials with precise control over their architectures at various length scales.

Learn more: https://bit.ly/3IJZXmV

PhD students winning at the International Coral Reef Symposium 2022 in Bremen, Germany

Róisín HAYDEN won the First Prize in The Best Poster Presentation for her poster entitled ‘Competition in the coral microbiome’, which illustrated how nutrient competition structures coral-algal symbiosis. Another student Emily CHEI also did well in the symposium, winning The Second Best Student Oral Presentation for her talk ‘Trophic plasticity of coral in response to seasonal fluxes’. Emily examined the trophic strategy shifts of seven coral genera between Hong Kong’s wet and dry seasons.

Emily CHEI

Róisín HAYDEN

Two Research Postgraduates Won the 1st and 2nd Runner-ups in HKU 3MT Competition

PhD student Bovern Suchart ARROMRAK and MPhil Student Ka Hei CHEUNG won the first and second runner-ups, respectively, in HKU Three Minute Thesis (3MT ®) Competition 2022. Revisit their appealing presentations and learn more about bacteria and nano pollution from here: https://youtu.be/92ZBPIW5fCA

Is a ‘hungry bacteria’ a ‘jocky-eater’? by Bovern Suchart ARROMRAK: https://youtu.be/67dEn17hXK

Bioplastic: from a novel solution to nano pollution by Ka Hei CHEUNG: https://youtu.be/FZMFMxwXCA

Chemistry Postgraduates Winning Design Award at HK InnoX Academy

PhD students WANG Wanying and ZENG Tian from the Department of Chemistry, along with their teammates from different universities, were awarded the Best Product Design Award by Hong Kong InnoX Academy for their creative design of a water e-flow system to improve planting efficiency through nitrogen recycling.

Hong Kong InnoX Academy is an innovative non-profit educational institution aiming to cultivate students’ scientific innovation and entrepreneurial quality through design thinking and project-based teaching.

Year 3 PhD students Wanying Wang (1st from the left) and Year 4 PhD student Zeng Tian (2nd from the left), both from the Department of Chemistry.

Dr Eddy Kwok Fai LAM

Professor Vivian Wing-Yah YAM

Professor Ngaiming MOK

Dr Ka Ho LAW

Dr Joseph MICHALSKI

Miss Hannah Bethany TILLEY

Emily CHEI

Róisín HAYDEN

Bovern Suchart ARROMRAK

Ka Hei CHEUNG

Bovern Suchart ARROMRAK
HKU Science research about the global abundance and biomass of ants covered by more than 340 media outlets!

According to Almetric, a data science company that tracks the coverage of published research, our research story about estimating the total number of ants on Earth conducted by Dr Benoit GUÉNARD of the School of Biological Sciences, has been covered by more than 340 media outlets and 606 tweeters, ranking in the top 0.0076% of all research outputs scored by Almetric.

The team came up with a novel approach to count every ant on Earth and figured that the Earth harbours around 20,000,000,000,000,000 ants, and they weigh more than wild birds and mammals combined!

The article was published in the Proceedings of the National Academy of Sciences of the USA (PNAS).

Learn more: https://bit.ly/3rk9zNb

HKU start-up has been selected as one of the Forbes Asia 100 To Watch

ArchiREEF, a spinoff company co-founded by Dr David BAKER and PhD student Vriko YU from the School of Biological Sciences, has been featured in Forbes Asia 100 To Watch 2022! The list spotlighted 100 small companies and start-ups across the region that are addressing real-world challenges with fresh thinking and innovative products and services.

ArchiREEF is on a mission to restore 4,000 coral fragments across the Atlantic, Pacific and Indian oceans by 2025 with 3D-printed terracotta tiles, bringing hope to revolutionise coral restoration.

Learn more: https://bit.ly/3rk9zNb

First Year Experience of Science Master Class

Jerry NG, one of the top scorers in HKDSE 2021, is now in his second year of the 6688 Science Master Class at the School of Biological Sciences. Let us hear his story and get first-hand information on what it would be like to study in this elite programme.

Please tell us about your research experiences in your first year.

My field of interest is plant ecology, and I am supervised by Dr Jin WU, a specialist in this field.

I have been involved in a project about building a programme to classify different land classes in Hong Kong, such as secondary forests and grasslands. I am in charge of selecting training samples of different land classes and teaching the deep learning machine to recognise the corresponding land classes in a later stage.

My research involves intensive usage of geospatial analysis software and some AI techniques to explore mechanisms of plant-climate interaction. I am lucky to have had this opportunity to get familiar with the skillsets, and it definitely is an advantage to learn it in the early stage of the study, so I will master the skill when I become a research postgraduate.

Thanks to my master Dr Jin WU, and other researchers in my lab who helped me through it. Dr Wu gave me lots of advice, such as managing the time allocated to do different things. Most importantly, his wisdom inspired me to do research effectively.

Is it a challenging programme, and who would you recommend this programme?

I would recommend people who are passionate about science and determined to pursue a research career to join this programme. This programme is designed for students who are prepared to study at a faster pace. Therefore it is rather intense, and it would be easier for you if you love science. You should be ready to spend most of your time working with course materials. I take six courses every semester, but I don’t think the workload is really that heavy, provided that you put enough time into studying and finishing assignments. If you love science, you should be happy with doing science all the time!

Where will this programme lead you?

This programme will take me to the research field of botany and ecology. My plan after graduation will be to finish a doctorate degree first and then conduct research on my favourite succulent plants in their wild habitats, such as South Africa and Madagascar. I am also interested in re-introducing vegetation in the seriously degraded area.
A Seamless Transition from Science to Veterinary Profession

Unlike his friends in the cohort who were determined to become veterinarians since childhood, Jason’s enthusiasm gradually developed during his teenage and undergraduate years. His first experience of having animal companions could be traced back to his late high school period when he had this precious opportunity of fostering and training two Labrador puppies until they were ready for official guide dog training. The exposure to vet clinic visits, training sessions and the behind-the-scenes of a working animal sparked his interest in the field of Veterinary Medicine.

In 2019, Jason enrolled in HKU School of Biological Sciences to study Molecular Biology and Biotechnology (MBB). ‘The main reason I selected MBB was because I was genuinely interested in biology since high school, and the fact that the degree gives me the freedom to choose between different disciplines of science really appealed to me. I was also aware that there is an articulation pathway with this degree to Veterinary Medicine, which further encouraged me to join this programme,’ Jason said.

This Major offers specialised training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications, and he was given research opportunities to work in the animal lab, where stationed veterinarians were responsible for ensuring that animal welfare and practices were up to standard for good science to be conducted. It made him aware of the broad range of roles that a veterinary surgeon could take and made this career path more appealing. To further explore his interest in the field, he proactively joined various vet clinics as a volunteer and was fascinated by the fast-paced, challenging work style involving synergistic team collaboration and impeccable client communication.

Jason raised two puppies, Joy (left) and Q, in his late high school period.

Setting on the path to becoming a veterinarian

All these experiences added to his growing desire to become a veterinarian. He successfully enrolled in the Doctor of Veterinary Medicine (DVM) programme at University of Melbourne (UoMelb) after completing six semesters at HKU and has just started his first year of study in UoMelb since February 2022.

With the help of his academic advisor Dr Chi Bun CHAN of HKU School of Biological Sciences and the Faculty, the transition from HKU to UoMelb was smooth. He also thanked the experience working with animal models during his undergraduate period at the animal lab, ‘It was when the concept of biosecurity and animal husbandry were first introduced to me. Both are continually being expanded on and refined in my first year of vet school and will undoubtedly remain as a central part of my veterinary career.’

Seamlessly articulating a pathway to his dream

Moving to a new city could be daunting. But with the help of the amiable people in Melbourne, this transition has been almost seamless for him. He admired the Melburnians’ collaborative spirit, ‘In vet school especially, everyone would share materials, solve each other’s problems and push each other into achieving our goals. There is also a profound awareness of mental well-being in Melbourne. Maintaining a good work-life balance is highly emphasised here.’

One piece of advice he would offer to anyone considering a path to veterinary is that it is a challenging and workload-heavy field that requires extra effort, decisiveness and ability to withstand pressure. ‘Finding a sustainable work-life balance and having hobbies that can give you a break from studying is essential!’

Learn more about the articulation pathway to the Doctor of Veterinary Medicine (DVM) at the University of Melbourne: https://bit.ly/3R7eOv4

Full Story: https://bit.ly/3TCSDoB

From Bread to Beer - Rescuing Leftover Bread from Landfill

Would you be surprised to know that by opting for a beer made from excess bread, you could be protecting the planet just as you unwind with a refreshing beverage? This is the concept behind Alaric HUI, our alumnus of Master of Science in Environmental Management. His Bread-to-Beer project innovatively adopts the circular economy model to upcycle surplus bread by brewing them into beer. This waste management project saves these baked goods from ending up in landfills.

Upcycling the under-valued staple

While pursuing his Master’s degree in Environmental Management at HKU, Alaric and his teammate Tiffany HUI decided to conduct a research project, using it as an opportunity to apply their classroom-learned theories to real life. After months of brainstorming, an idea finally clicked as he was reminded of this food waste problem from his days working at Cathay Pacific Catering Services (CPCS). As a waste-conscious person and a beer lover himself, Alaric was then inspired by a UK brewing company’s upcycling solution, which dawned on him to actualise the Bread-to-Beer idea in Hong Kong’s market.

The duo invested hours into conducting background research. They even stood outside numerous small and chain bakeries at the end of the working day, and carried the to-be-discarded bread back home to be counted and made their own statistical estimates. Though, the biggest challenge was yet to come. They struggled to convince breweries to help produce a prototype batch without any tangible proof of their idea. Finally, they tried their luck by reaching out to their instructor of the home-brewing course they signed up together earlier. Little did they know that the instructor was actually the founder of HEROES Beer Co., a locally renowned craft brewery. ‘Funny enough, without any hesitation, he just said yes. Fast forward to a month and a half later, the beer was successfully made, and he sent me 12 bottles of it,’ laughed Alaric at his lucky chance encounter.

‘I realised that there was a great impact created by human activities on our surroundings, especially problems like pollution and waste that are prevalent in Hong Kong. Learning this triggered me to want to do something focused on this area.’

Creating a more sustainable society

Consolidating his idea into a practically-applicable proposal using insights gained from the MSc programme, Alaric successfully persuaded his then employer CPCS to give the green light to implement his project. This gave birth to the VHHX Vienna Lager, completing his own circular journey of giving back to the place from where he got his inspiration.

After thanking his supervisor Dr Janet CHAN of the School of Biological Sciences, Alaric wished to impart the essence of being altruistic to future students. ‘Think about how a project can benefit society, not only you. Because you will already benefit a lot from the process of doing the project itself,’ he emphasised. ‘I think the outcome of what you and your teammates have done can go beyond what you initially imagined,’ he reiterated as he looks forward to branching out into the industry on the back of this triumphant pilot project.

From idea to implementation

The duo invested hours into conducting background research. They even stood outside numerous small and chain bakeries at the end of the working day, and carried the to-be-discarded bread back home to be counted and made their own statistical estimates. Though, the biggest challenge was yet to come. They struggled to convince breweries to help produce a prototype batch without any tangible proof of their idea. Finally, they tried their luck by reaching out to their instructor of the home-brewing course they signed up together earlier. Little did they know that the instructor was actually the founder of HEROES Beer Co., a locally renowned craft brewery. ‘Funny enough, without any hesitation, he just said yes. Fast forward to a month and a half later, the beer was successfully made, and he sent me 12 bottles of it,’ laughed Alaric at his lucky chance encounter.

‘I realised that there was a great impact created by human activities on our surroundings, especially problems like pollution and waste that are prevalent in Hong Kong. Learning this triggered me to want to do something focused on this area.’

Creating a more sustainable society

Consolidating his idea into a practically-applicable proposal using insights gained from the MSc programme, Alaric successfully persuaded his then employer CPCS to give the green light to implement his project. This gave birth to the VHHX Vienna Lager, completing his own circular journey of giving back to the place from where he got his inspiration.

After thanking his supervisor Dr Janet CHAN of the School of Biological Sciences, Alaric wished to impart the essence of being altruistic to future students. ‘Think about how a project can benefit society, not only you. Because you will already benefit a lot from the process of doing the project itself,’ he emphasised. ‘I think the outcome of what you and your teammates have done can go beyond what you initially imagined,’ he reiterated as he looks forward to branching out into the industry on the back of this triumphant pilot project.

From idea to implementation

The duo invested hours into conducting background research. They even stood outside numerous small and chain bakeries at the end of the working day, and carried the to-be-discarded bread back home to be counted and made their own statistical estimates. Though, the biggest challenge was yet to come. They struggled to convince breweries to help produce a prototype batch without any tangible proof of their idea. Finally, they tried their luck by reaching out to their instructor of the home-brewing course they signed up together earlier. Little did they know that the instructor was actually the founder of HEROES Beer Co., a locally renowned craft brewery. ‘Funny enough, without any hesitation, he just said yes. Fast forward to a month and a half later, the beer was successfully made, and he sent me 12 bottles of it,’ laughed Alaric at his lucky chance encounter.

‘I realised that there was a great impact created by human activities on our surroundings, especially problems like pollution and waste that are prevalent in Hong Kong. Learning this triggered me to want to do something focused on this area.’

Creating a more sustainable society

Consolidating his idea into a practically-applicable proposal using insights gained from the MSc programme, Alaric successfully persuaded his then employer CPCS to give the green light to implement his project. This gave birth to the VHHX Vienna Lager, completing his own circular journey of giving back to the place from where he got his inspiration.

After thanking his supervisor Dr Janet CHAN of the School of Biological Sciences, Alaric wished to impart the essence of being altruistic to future students. ‘Think about how a project can benefit society, not only you. Because you will already benefit a lot from the process of doing the project itself,’ he emphasised. ‘I think the outcome of what you and your teammates have done can go beyond what you initially imagined,’ he reiterated as he looks forward to branching out into the industry on the back of this triumphant pilot project.

From idea to implementation

The duo invested hours into conducting background research. They even stood outside numerous small and chain bakeries at the end of the working day, and carried the to-be-discarded bread back home to be counted and made their own statistical estimates. Though, the biggest challenge was yet to come. They struggled to convince breweries to help produce a prototype batch without any tangible proof of their idea. Finally, they tried their luck by reaching out to their instructor of the home-brewing course they signed up together earlier. Little did they know that the instructor was actually the founder of HEROES Beer Co., a locally renowned craft brewery. ‘Funny enough, without any hesitation, he just said yes. Fast forward to a month and a half later, the beer was successfully made, and he sent me 12 bottles of it,’ laughed Alaric at his lucky chance encounter.

‘I realised that there was a great impact created by human activities on our surroundings, especially problems like pollution and waste that are prevalent in Hong Kong. Learning this triggered me to want to do something focused on this area.’

Creating a more sustainable society

Consolidating his idea into a practically-applicable proposal using insights gained from the MSc programme, Alaric successfully persuaded his then employer CPCS to give the green light to implement his project. This gave birth to the VHHX Vienna Lager, completing his own circular journey of giving back to the place from where he got his inspiration.

After thanking his supervisor Dr Janet CHAN of the School of Biological Sciences, Alaric wished to impart the essence of being altruistic to future students. ‘Think about how a project can benefit society, not only you. Because you will already benefit a lot from the process of doing the project itself,’ he emphasised. ‘I think the outcome of what you and your teammates have done can go beyond what you initially imagined,’ he reiterated as he looks forward to branching out into the industry on the back of this triumphant pilot project.
ACKNOWLEDGEMENTS

We would like to express gratitude to our donors for their recent support, which is paramount for us to grow and scale new heights. Listing of donors in alphabetical order of organisation names and surnames.

Corporate donors
- Halcrow China Limited
- Marine Ecology & Fisheries Enhancement Funds Trustee Limited
- New World Group Charity Foundation Limited
- The Swire Group Charitable Trust
- The Hong Kong and China Gas Company Limited
- NCSI(HK) Limited
- Ocean Park Conservation Foundation, HK

Individual donor
- Mr William Hung Cheung CHAN

FACULTY OF SCIENCE

G/F, Chong Yuet Ming Physics Bldg., The University of Hong Kong, Pokfulam Road, Hong Kong
Tel: 3917 2683  Email: science@hku.hk

Science@HKU is not for sale. The Faculty reserves the right to publish and edit any material submitted for publication. Views expressed in Science@HKU by individual contributors do not necessarily represent those of the Faculty and/or the University. Science alumni and friends can subscribe to Science@HKU online through the homepage of Faculty website.

Please scan the QR code to view our past newsletters.