

香港大學理學院通訊



香港大學理學院
FACULTY OF SCIENCE
THE UNIVERSITY OF HONG KONG



HKU SCIENCE
Oak Anniversary
明德於樸 格物以理

ISSUE
27

Science @HKU 港理

FACULTY OF SCIENCE NEWSLETTER

Science Philanthropy:
Gift to create impacts and benefit mankind



80 Glorious Years
of Home
to Science



Message from the Chief Editor & Associate Dean (Development and External Relations)

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*If you want happiness for an hour, take a nap.
If you want happiness for a day, go fishing.
If you want happiness for a year, inherit a fortune.
If you want happiness for a lifetime, help somebody.*

~Chinese proverb

Dear readers,

This newsletter is dedicated to the theme
"Science Philanthropy".

While having a drink with an alumnus, he informed me about his plan to make the biggest donation in his life to support our undergraduate students, who need help financially to finish their study and to explore the world via exchanges with other universities. He shared that "because of some caring people, I was able to graduate from the university. I will always remember the people who have helped me when I needed it".

To give and receive is to welcome the abundance of this universe, and by doing so, we participate in the eternal cycle of sharing. When we give, we not only help the immediate recipient of our gift, we also spur a ripple effect of generosity to people around us. Our relationships become more vibrant and fulfilling because these exchanges promote a sense of trust and cooperation that strengthens our connection with others, adding richness and depth in all areas of our lives by building stronger communities as a whole. Humans have evolved and have grown stronger together through time because within each of us, we feel the innate need to understand, reach out and care. It is within our capacity to help regardless of our financial or physical abilities.

In this issue of the newsletter, we witness several eminent philanthropists of Faculty of Science who have made generous donations to our students and scientists. They have shared with us their views and philosophy in helping science development and literacy in Hong Kong. I am grateful to them not just because of the amount they have given to us, I am grateful to them because they have created that ripple effect to make a difference. I urge you all to follow the examples of our generous donors and participate in giving to the Faculty what you can and when you can. Together, we can all make a difference.

Yours sincerely,

Professor Billy K C CHOW

Chief Editor

Associate Dean (Development and External Relations)

Professor, Chair of Endocrinology





Science is the foundation of human society advancement. It creates substantial impacts on the world in the form of scientific breakthrough and policy advocacy. In recent years HKSAR government has put greater emphasis on innovation and technology, along with the opportunities emerged in mainland China. To tap on these opportunities and sharpen our edges to create new knowledge, apart

from governmental support, gifts from society (either on individual or corporate basis) are crucial for the long-term development of our Faculty to achieve interdisciplinary synergy.

Science philanthropy is not simply a monetary concept, it reflects visions about what Science and our community could be. Our strong supporters have shared their insights, with the hope of philanthropic spirit succession across generations.

Visions of Our Strong Supporters

Words from
our alumni

Unfailing Investment in Education

Dr Patrick Sun Cheong POON

1970 BSc graduate

Chairman, Harvest SCP Group Co. Ltd.

“Embrace what you
have and give back.”



University is the place where creation of knowledge and nurturing of future generations happen. “We should invest in students so that they can help improve the world,” said Dr Patrick Sun Cheong POON. Dr Poon is always very thankful to HKU for his irreplaceable experiences at HKU during his school years, motivating him to give back to HKU and the community.

One way of giving back is to provide funds and scholarships for optimising students’ learning experiences, transforming them and pushing them forward to lead the path in their interested fields.

Education is not confined to knowledge. Residential college experience somehow shapes the students into what kind of adults they are. Dr Poon is the main donor of Lap-Chee College of the HKU Jockey Club Student Village III. He believes that “university dormitory serves as a place for students to greatly improve their self-management and interpersonal skills, to learn how to behave and work ethically, as well as to become part of a greater community.” He wishes to provide an environment filled with the spirit of community service and warm support among members.

Research is another indivisible part of Science. It creates knowledge and brings enlightenment. Yet currently in Hong Kong, not much support is devoted to basic research. When talking about his support in research facilities and resources, Dr Poon mentioned the importance of basic science, which indeed benefits the human race. He shared that “Hong Kong is a good place. The only thing we have to do is to create the environment for our top-tier scientists”.

University is the perfect place for students to explore new opportunities and absorb knowledge in every way possible, a platform for scientists to achieve research breakthrough. It is our understanding and care for the world that pushes philanthropy forward. Philanthropy comes from within.

Article contributed by BSc student Miss Jackie Tsoi



Philanthropy at HKU

- Established Patrick Poon Endowed Professorship in Statistics & Actuarial Science
- Established Patrick Poon Lecture Series in Actuarial Science
- Established Patrick Poon Scholarships in Statistics & Actuarial Science
- Established Patrick S C Poon Scholarship in Statistics and Risk Management
- Established Patrick Poon Exchange Programme of Actuarial Science Teachers with mainland China
- Established Patrick S C Poon Endowed Professorship in Analytics and Innovation (Faculty of Business and Economics)
- NAM-HKU Fellowship (Faculty of Medicine)
- Benefactor of HKU Lap-Chee College



Roles at HKU

- Court Member of The University of Hong Kong
- Council Member of The University of Hong Kong
- Deputy Chairman of the Board of Directors of the HKU Foundation
- Chairman of The University of Hong Kong Convocation Standing Committee
- Chairman of Advisory Committee, Lap-Chee College
- Honorary Fellow of HKU 2011

To Mr Stanley Yu Lun CHU, there is a distinction between philanthropy and charity. "The idea of charity is to reduce the suffering caused by natural and human disasters; whereas philanthropy seeks to eliminate social problems, such as alleviating wealth gap by equipping the underprivileged with self-provisioning skills. That is why we do philanthropy. We strive for sustainability," Mr Chu remarked.

Sustainability here has two implications. First it is about the sustainable act of doing philanthropy among society. Mr Chu expressed his wish that his philanthropy could cultivate a sense of gratefulness and pay it forward. "I am very thankful that I received tertiary education at my time, enabling me to climb up the social ladder. Therefore, I have always wanted to contribute back to the society; and most vitally, practising philanthropy brings me joy and happiness," Mr Chu stressed, "exhibiting philanthropy is a blissful thing, nothing extraordinary".

Another implication is the sustainable development and the betterment of our community. Mr Chu believes that science philanthropy could nurture talents with not only rich knowledge, but also with integrity, ethics and other positive values. This brings up his expectation on students. "Students receiving scholarships indeed bear expectation from the donors," said Mr Chu. He stated that donation is with purpose. He hopes students would not only enjoy a joyful holiday abroad, but also take few more steps to observe and immerse into different cultures, to learn problem-solving skills and broaden their horizons.

With either implication, "philanthropy" reads like a big word, yet Mr Chu quoted the motto "Live present life fully and boldly" 「此時、此地、此身」 to elaborate that as long as you do your best at your current situation, you do not need to compare with anyone else; and you are making a difference already.

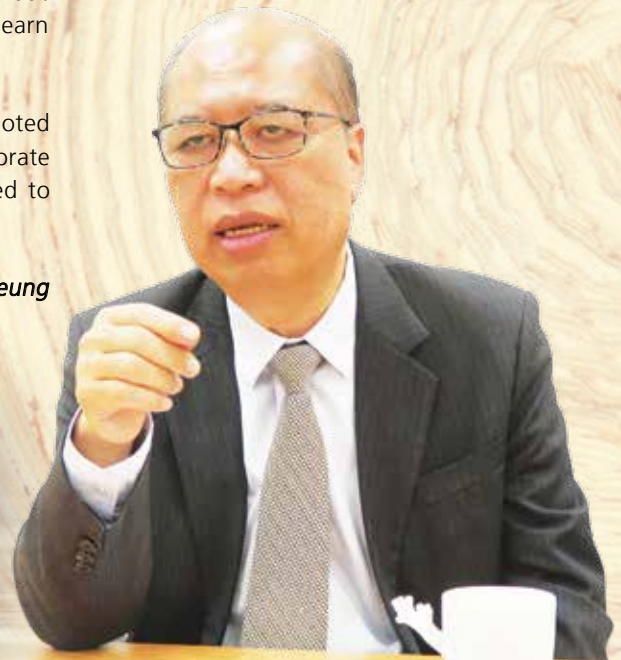
Article contributed by BSc student Miss Eunice Leung

Mr Stanley Yu Lun CHU

1973 BSc graduate

Founder and Chairman, Adsale Group

"We are blessed,
so that can be
blessing of others."



Philanthropy at HKU

Donations for

- HKU DreamCatchers
- HKU First-in-the-Family Education Fund
- Stanley Chu and Annie Chow Scholarship in Student Enrichment



Philanthropy made with fellow HKU alumni

- HKUGA College
- HKUGA Primary School



Roles at HKU

- Founding Senior Member of the HKU Foundation
- Founding President of the HKU Science Alumni Association Ltd.
- Ex-Co Member and Vice Chairman of the Hong Kong University Graduates Association Education Foundation
- Honorary Fellow of HKU 2011

Be the Enabler for Building a New World – TCL Corporation

Words from
the industry

The world is rapidly changing. While we are being pushed forward by the flow of changes, we could indeed be the force of the advancement.

TCL Corporation devotes itself in research and development that advances the state-of-the-art in the technology field, applying Artificial Intelligence (AI) to TCL products and to new domains. To pursue such changes and create impacts, collaborations with scientists are inevitably crucial. Being the loyal supporter and enabler of HKU Science, we believe only by new knowledge and novel applications derived from science research projects, there could be amazing benefit to mankind.

Artificial Intelligence (AI) is one good example. It demonstrates exciting new ways in electronics, smart home, Internet of Things (IoT) manufactory, semiconductor materials, etc., solving problems for our users, our customers, and the world. In order to bring artificial intelligence theory, technology, and application to the world's leading level, talents, research and teaching excellence are the key points; that is why we keep on making progress and dedicate to science philanthropy.



HKU signed agreement with TCL on Innovative Research Fund for Faculty of Science 80th Anniversary

HKU and TCL signed an agreement on joint research centre in artificial intelligence (AI)

Dr Dahai YU

General Manager,
Director of AI Research Institute,
TCL Corporate Research (HK) Co. Ltd.



TCL and HKU Science

In light of HKU Science Oak Anniversary, TCL has made a gift for launching the "TCL Innovative Research Fund for Faculty of Science 80th Anniversary". The scheme supports 10 PhD students to develop innovative research projects in biomedical science, big data analytics, artificial intelligence, and material science for four years.

This year, TCL further pledges a fund to the Faculty of Science and Faculty of Engineering, for supporting artificial intelligence research undertaken at the "HKU-TCL Joint Research Centre for AI" for a fixed term of five years.

Dr Winnie Shuk Ming TANG

1999 PhD graduate
Founder and Chairman,
Esri China (Hong Kong) Limited
Donor of Winnie S M Tang Scholarship in
Applied Artificial Intelligence



"Artificial Intelligence (AI) is expected to be a ubiquitous part of our lives. As an alumna of the Science Faculty, I am proud that the Faculty is taking a lead in introducing a new interdisciplinary undergraduate programme in Applied AI, which will meet the needs of a future-ready city. That is why I am pleased to support the funding of the undergraduate scholarship for the programme.

I believe the gift can help nurture the younger generation, assist the University to stay pre-eminent in the AI race, and strengthen Hong Kong's position as a talent hub in the Greater Bay Area. Let's make a gift and realise our visions together to make a better Hong Kong."

A Grounded Contributor – The Swire Group Charitable Trust

To The Swire Group, “it has been in family’s blood to give back. The Trust was formally established in 1983 as a philanthropic arm of the corporation,” remarked Ms Tina CHAN, Head of Philanthropy of The Swire Group Charitable Trust.

“Swire started their business as a shipping company and has been running for 200 years; the ocean is very close to our hearts.” Ms Chan mentioned that marine conservation is their key focus. “We hope to use policy change, research and education to resolve the issues of biodiversity loss, overfishing and pollution in our waters.” Ms Chan understands that it is a long journey and only through collective effort, the above goals could be realised; and science philanthropy is one of the keys.

Science enables us to understand the world, it is also the ground to advocate policy change and arouse public awareness. Scientific evidence is necessary to pinpoint the problems around us – the first step to change. Only with science, one can strive to achieve policy change and create impacts. The Trust hopes to build a platform to transform the good causes into reality. In this sense, science philanthropy does not merely help supporting science research, it indeed plays an important role to foster the translation of science knowledge to societal impacts.

Apart from basic science research, education is equally essential; Ms Chan remarked “teaching is not done by teaching, it is by inspiring”. Only by inspiring the future generations, we can achieve and create sustainable values. The Trust established The Swire Institute of Marine Science (SWIMS) to provide a multidisciplinary research environment, as well as to grow a research culture and train young scientists.

On a final touch, Ms Chan concluded with Swire’s motto “Esse Quam Videri” (“to be, rather than to seem to be”) – to be grounded and contribute to society.

Article contributed by BSc student Mr Harrison Li

Ms Tina CHAN

*Head of Philanthropy,
The Swire Group Charitable Trust*



“Science Philanthropy is the catalyse to create impacts from scientific research and education.”

*Swire Institute of Marine
Science (SWIMS)*



Philanthropy at HKU

Funded the off-campus research centre The Swire Institute of Marine Science (SWIMS) at the Faculty of Science to foster research and education links and collaborations.



More about the Trust

Established in 1983, the Swire Trust is the philanthropic arm of Swire Pacific Limited and a registered Hong Kong charity. The Trust aims to create positive change in Education, Marine and Arts.



Dr Gerald L CHAN

Co-Founder, Morningside Group

Established Morningside Professorship in Chemical Biology in 2005

Dr Gerald L CHAN believes that translation of Science is utterly essential for bringing tangible benefits to society.

“There is a treasure trove of scientific discoveries that hold promise of benefiting society if only more resources can be devoted to translational work.”

— quoted from Dr Chan’s speech at The Carnegie Lecture, University of Glasgow, Scotland. March 6 2019, “On Translational Science — The Alchemy of Turning Science into Medicine” on <https://www.geraldchan.net/>

Grow Our Oak

Faculty of Science Oak Anniversary Fund

Benefiting mankind with
innovative research and scientific training

Your support will help us grow

Your gift might be eligible for matching with the upcoming Eighth Government Matching Grant Scheme. Make a gift now!



Special facilities at
new science building &
expansion of SWIMS



Innovative
research



Student enrichment
& scholarship

Oak Anniversary Tree

- Show your support of the Faculty's continuous advancement in our key areas:
 - special facilities at the new science building & expansion of SWIMS
 - innovative research
 - student enrichment and scholarship
- We are ambitious to scale new heights ahead and we need HK\$10 million plus 3 Endowed Professorships to fund our initiatives
- Create a tangible memory of your fond times at HKU, as your name/message will be inscribed onto our Oak Anniversary Donor Tree
- The donor tree is installed on a prominent wall at the Faculty of Science and its permanent home would be one of our science buildings

Inscribe your own message, either honoring your loved ones or celebrating a special occasion

Make a gift and help us grow our oak!



Oak Leaf Donor

HK\$ 10,000 or above
(entitled to inscribe on
a leaf for each donation
of HK\$10,000)



Oak Acorn Donor

HK\$ 50,000 or above
(entitled to inscribe on
an acorn)



Oak Flower Donor

HK\$ 200,000 or above
(entitled to inscribe on
an oak flower)



Oak Foundation Donor

HK\$ 1,000,000 or above
(entitled to inscribe on the
foundation)
(Faculty of Science Patron Circle)

Contact point:

Naussica Lau (Tel: 3917-7897 Email: nauslau3@hku.hk)
Cindy Chan (Tel: 3917-5286 Email: cindycst@hku.hk)

More information:



<https://www.scifac.hku.hk/giving>

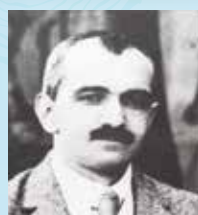
80 Glorious Years of Home to Science



Our Glamorous History

1910s

- Subjects of Pure and Applied Mathematics, Physics and Chemistry were offered when the University was founded
- Department of Physics was established in 1914



1939

Professor Walter BROWN
The first Dean of Science

Founding of Faculty of Science with four departments: Biology, Chemistry, Mathematics and Physics; Professor Walter BROWN as the first Dean of Science

1967

Department of Statistics and Actuarial Science was established; joined the Faculty of Science in 2004

1990



Swire Marine Laboratory in Cape d' Aguilar opened, later renamed as Swire Institute of Marine Science (SWIMS) in 1994

1995

Earth Science Unit became Department of Earth Sciences

2007

- Introduction of common admission to 6901 Bachelor of Science (BSc) programme
- Formation of School of Biological Sciences with the merging of the Botany, Ecology & Biodiversity and Zoology departments



2010

A Partner State Key Laboratory was established on Synthetic Chemistry



2012

4-year undergraduate degree curriculum was launched under the education reform in Hong Kong



2015

- Worldwide alumni number hit 20,000
- Total number of Chinese Academy of Sciences (CAS) academicians reached 4



2017



Five-year Plan has been formulated for Faculty's strategic moves, aiming high by targeting academic staff growth of 20% and maximising research performance

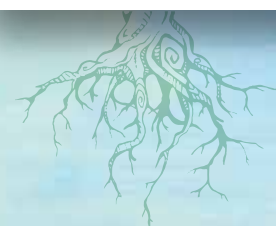
6 Research Divisions are being established to maximise research performance, identify and nurture research strengths, and incentivise research activities:

- Chemistry
- Earth and Planetary Science
- Ecology and Biodiversity
- Mathematical and Statistical Science
- Molecular and Cell Biology
- Physics and Astronomy

2019



Walking through 80 years, footprints of generation of alumni, staff, teachers and students form diverse paths, impacting the world with their unique strengths and visions. It is a momentous time to reunite, reminisce the stories of HKU Science family members, and to review the achievements in teaching and research. It is an anniversary of all and the celebration belongs to everyone.



Laughter Filled the Air at the Launch of Oak Anniversary Celebrations

HKU SCIENCE OAK ANNIVERSARY

Opening Ceremony cum
Home-Coming Day



From the left: Dean of Science Prof. Matthew EVANS, the President Prof. Xiang ZHANG, Vice-President Prof. Andy HOR and Associate Dean of Science Prof. Billy CHOW

The official launch of our Oak Anniversary at the Opening Ceremony cum Homecoming Day on March 9, 2019 marked the commencement of a host of year-long celebration activities. The event was attended by more than 200 alumni, friends and members of HKU Science family.

The reunion brought memories of joy and laughter for all, and through fun-filled games, exhibits, campus tours and the chance to mingle with faculty members and students, our alumni reminisced about their fond memories of university life and got to know about the latest developments of the Faculty. To add meaning to the Oak Anniversary, we also invited our guests to witness the planting of our anniversary oak and its growth over the coming years.

Oak Anniversary emphasises the “connect” message among generations of HKU Science family. Our alumni may step into different industries after graduation and live diversely, but undoubtedly they share the same starting point — HKU Science; our teachers, students and staff may come from various backgrounds and have their own past, but undeniably their present and future attach to HKU Science. We wish these stories could arouse resonance among HKU Science community and together we grow the Oak tree.



Guests toasting on this happy occasion



The HKU Science family



HKU President Professor Xiang ZHANG and Dean of Science Professor Matthew EVANS planting the oak tree for the Faculty of Science 80th Anniversary



Distinguished alumni and guests witnessing the planting of the oak tree



Research Eminence

LEADS 5 AREAS OF EXCELLENCE (AoE)

projects to foster international and inter-institutional collaboration

Our Strengths

World-class Rankings of HKU

THE By Times Higher Education World University Rankings 2019

#4 among the universities in Asia

#36 in the world

QS WORLD UNIVERSITY RANKINGS By Quacquarelli Symonds (QS) World University Rankings 2019

#2 by QS Asia University Rankings

#25 in the world

Top-ranked Scientists

According to Clarivate Analytics' Essential Science Indicators 2018

16% of our professoriate staff are the world's **Top 1%** scholars

Highlights of Our Celebrations in 2019



9 March



20 February - Mr Chiu Ying Lam
 4 March - Mr Wing Luk Chan
 9 April - Dr Patrick S C POON



25 May



13-26 July



6 September



17 November





FACULTY OF SCIENCE
THE UNIVERSITY OF HONG KONG



HKU SCIENCE
Oak Anniversary
明德於樸 格物以理

HKU SCIENCE OAK ANNIVERSARY



Let Memories Sparkle

17 NOVEMBER 2019 (SUN)

7 pm – 9:30 pm
(Cocktail Reception from around 6 pm)

Convention Hall, Old Wing,
Hong Kong Convention & Exhibition Centre

TICKETS ARE SELLING FAST. BOOK NOW TO ENJOY THE EARLY BIRD OFFER!

Guests

Early Bird	HK\$1,300/ per person (early bird offer available till June 30, 2019)
Regular	HK\$1,500/ per person

*Your class can save HK\$ 2,400 if you have successfully
formed a table of 12 with the early bird offer)*

For enquiries, please contact the Faculty of Science at



3917-2683



scialum@hku.hk

Please visit
<https://www.scifac.hku.hk/galadinner>
to register



Termites Mitigate Effects of Drought in Tropical Rainforest

By Dr Louise ASHTON, Assistant Professor of School of Biological Sciences



Termites are highly abundant in tropical ecosystems. They are one of the few living creatures that can break down cellulose found in plant material. Termites' unknown side was recently revealed by a major new study published in the prestigious journal *Science*. The collaborative research, co-led by Dr Louise ASHTON of The University of Hong Kong, researchers from The University of Liverpool and the Natural History Museum of London, has discovered that termites actually help mitigate against the effects of drought in tropical rain forests.

A large-scale field experiment was established in Bornean rainforest at the beginning of the 2015 El Nino drought and carried on through 2016 during non-drought conditions. This allowed the team to investigate not only the roles of termites in tropical rainforests, but also how drought influences termite activity and the knock-on effects in the ecosystem.

The doubled number of termites during the drought resulted in higher rates of leaf litter decomposition and nutrient heterogeneity, and increased soil moisture and seedling survival rates compared with the non-drought period. This work has far-reaching implications for understanding carbon cycling in tropical rainforests and their resilience to further climate change.



For Further Reading



Press release:
<http://bit.ly/2lxq1ov>



Dr Ashton's
research website:
louiseashton.net

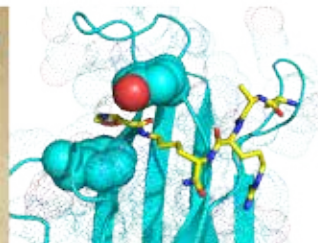
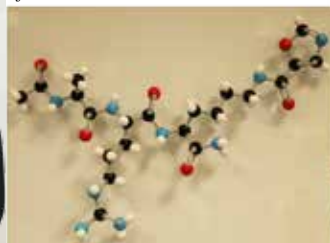
First-in-class YEATS Inhibitors Showing Promise for Leukemia Treatment

By Dr Xiang David Li, Associate Professor of Department of Chemistry

Acute myeloid leukemia (AML), a fast-growing cancer that attacks bone marrow and blood cells, is the second most common type of leukemia in children and adults. To search for new strategy to treat this disease, the research team zoned in on ENL, a recently identified leukaemia-boosting protein.

ENL contains a small domain called YEATS. Just as a barcode-reading scanner, the ENL YEATS recognises special "tags" (known as acetylation) on our genome causing faulty activation of cancer-promoting genes in human AML cells. Taking an interdisciplinary approach, the team developed the first-in-class ENL inhibitor that was able to successfully tune down the cancer-promoting gene expression in human AML cells. Their discovery opens a new avenue for treating this life-threatening disease.

The first-in-class ENL inhibitor developed by Dr Li's group shows promise for leukaemia treatment.



For Further Reading



Press release:
<http://bit.ly/2uWIPVY>

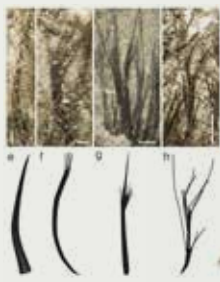


Lasers Help to Push Back the Origin of Feathers

By Dr Michael PITTMAN, Research Assistant Professor of Department of Earth Sciences

Exceptional fossils have demonstrated that feathers originated in non-flying carnivorous dinosaurs 160+ million years ago and were later refined into aerodynamic structures when they took to the skies, giving rise to modern birds. Feather-like structures discovered in more distantly related dinosaurs and in flying pterosaurs — close relatives of dinosaurs — point to a much earlier origin for feathers, but this has been highly controversial.

Four types of early feather are known in both pterosaurs and carnivorous dinosaurs.



Reconstruction of a feathered pterosaur



Press release:
<http://bit.ly/2UmTZ0z>

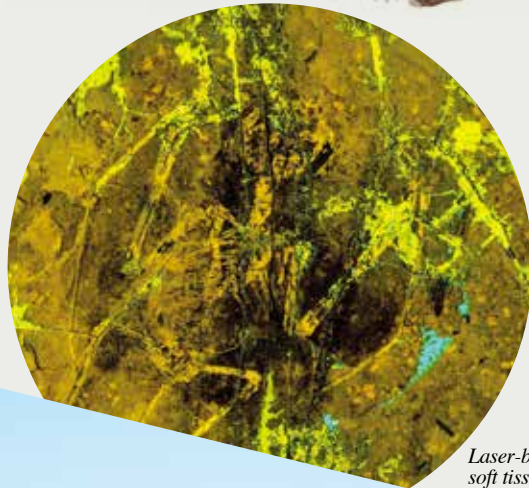


'Pterosaur integumentary structures with complex feather-like branching':
<https://go.nature.com/2KDX78x>



News & Views Article in Nature Ecology & Evolution*:
<https://go.nature.com/2lI4Pmd>
*Remarks: available to subscribers only

Reference book 'Pterosaur integumentary structures with complex feather-like branching' by Z. Yang, B.Y. Jiang, M.E. McNamara, S.L. Kearns, M. Pittman, T.G. Kaye, P.J. Orr, X. Xu & M. Benton in *Nature Ecology and Evolution* 3, 24-30 (2019)



Laser-based imaging revealed preserved soft tissues in pterosaur fossils (in black)

The Alternating Direction Method of Multipliers (ADMM)

By Professor Xiaoming YUAN, Professor of Department of Mathematics

The Alternating Direction Method of Multipliers (ADMM) was proposed in 1975; and it is now a benchmark algorithm being widely used in many fields. Many critical mathematical issues of ADMM, however, had remained unsolved for a long time until the work of Professor YUAN and his collaborators has been published. They had made several widely-acknowledged breakthroughs to this algorithm, including the first proof of its convergence rate and the first counter example showing that the direct extension of ADMM to multi-block convex programming problems is not necessarily convergent.



Planet Discovered Orbiting the Second Closest Stellar System to the Earth

By Dr Man Hoi LEE, Associate Professor of Department of Earth Sciences and Department of Physics



Artist's impression of the planet under the orange tinted light from Barnard's star. (Image credit: IEEC/Science-Wave - Guillem Ramisa. Licence: Creative Commons with Attribution)

An international team of astronomers that includes Dr Man Hoi LEE has discovered a candidate planet in orbit around Barnard's star, the closest single star to the Sun and second only to the Alpha Centauri triple stellar system. The planet is a super-Earth with a minimum of 3.2 Earth masses, and it orbits its cool red parent star every 233 days. The analysis used observations from seven different instruments, spanning 20 years, making this one of the largest datasets ever used for radial velocity studies. The discovery of this planet and a planet in the Alpha Centauri system confirms the statistical result by the Kepler space telescope that most stars should have planets around them.

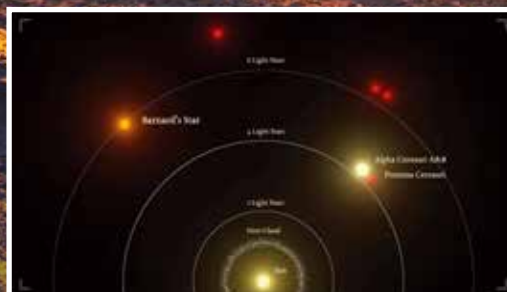
For Further Reading



Press release:
<http://bit.ly/2VO9hwW>



Research video:
<http://bit.ly/2GpgbDn>



Graphic representation of the relative distances to the nearest stars from the Sun. Barnard's star is the second closest star system, and the nearest single star to us. (Image credit: IEEC/Science-Wave - Guillem Ramisa. Licence: Creative Commons with Attribution)

Background image caption: Artist's impression of the planet's surface. (Image credit: ESO - M. Kornmesser. Licence: Creative Commons with Attribution)

Scalable Learning for Massive and Online Data in PK/PD Modeling and Drug Repositioning

By Dr Jinfeng XU, Associate Professor of Department of Statistics and Actuarial Science; Dr Steven XU, Janssen Company, US

With the accelerating growth in size of datasets, it becomes increasingly prevalent to embrace the core inferential need to allow efficient use of available resources. At the early stages of drug development, pharmacokinetic/pharmacodynamics (PK/PD) modeling and simulation (M&S) is an important tool for Drug Safety and Efficacy Evaluation. In drug repurposing, *In silico* modeling and target docking are empowered by leveraging the thousands of drugs and compounds, and integrating many different types of data such as clinical reports, peer-reviewed, patent literature and gene-regulation mining. The team is currently developing novel scalable inferential learning tools to enhancing the AI-assisted PK/PD modeling and drug discovery.



Dr Jinfeng XU



Dr Steven XU

For Further Reading

Journal of Machine Learning Research 19 (2018) 1-21:
<http://bit.ly/2XfVDD0>



Press article:
<http://bit.ly/2ZhVdJs>



The North Atlantic Ocean Circulation at Its Weakest Since the Past 1,500 Years

By Drs Christelle NOT (Assistant Professor) and Benoit THIBODEAU (Research Assistant Professor), Department of Earth Sciences and the Swire Institute of Marine Science

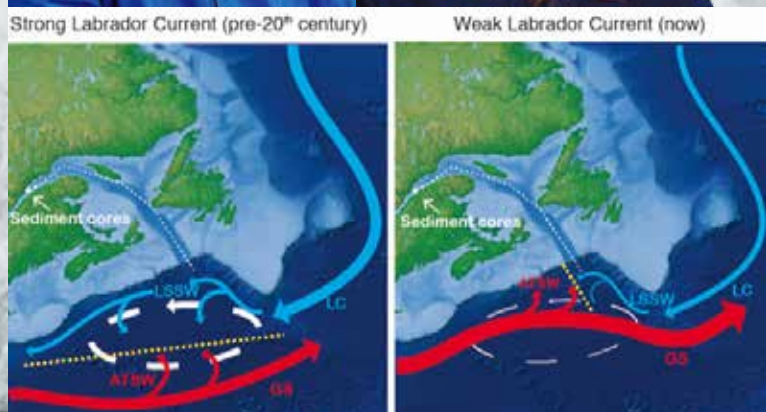
Climate models have predicted a weakening of the circulation in the Atlantic due to the release of freshwater by the melt of the Greenland ice sheet. However, until now no field data could observe this weakening because of the technological challenge of quantifying the strength of ocean circulation. Our research developed a new proxy to reconstruct the strength of the circulation, one that can be applied in the past through the study of sediment cores. By this we could demonstrate, for the first time at high resolution, that the circulation is currently at its weakest in the past 1,500 years. This is a crucial information required to anticipate near-future change in global climate.

Foraminifer specie
used in this study



Dr Benoit
THIBODEAU

Dr Christelle
NOT



For Further Reading



Press release:
<http://bit.ly/2GpMC4K>

Revisiting Photosynthesis

By Dr Boon Leong LIM, Associate Professor of School of Biological Sciences

Do you feel that Hong Kong is getting hotter? Climate change caused by carbon dioxide (CO₂) accumulation in the atmosphere is an imminent threat to us. Photosynthesis captures CO₂ and converts it into carbohydrates, which provides energy directly or indirectly to all live forms. To fix CO₂, both ATP (energy) and NADPH (reducing power) generated from photosystems are consumed at a specific ratio in the chloroplasts. Since 1969, it has been generally accepted that cytosolic ATP can enter chloroplasts to support CO₂ fixation and supply energy to chloroplasts at night. Dr Lim's team has overturned this belief and showed that cytosol ATP does not enter mature chloroplasts. This finding has revised our understandings in photosynthesis and chloroplast biology.



Seedlings with ATP sensor



For Further Reading

Press Release:
<http://bit.ly/2GtiKV5>



Science Daily:
<http://bit.ly/2InUUMP>



Asian Scientist:
<http://bit.ly/2InVH0f>



Think Big and Be the Next Global Leader

Doing science is not confined to the laboratories, and it is with purpose. Science is the foundation of societal advancement, so it is important for us to step out of the laboratories and translate science into applications benefitting the mankind. Our students have ample opportunities to get in touch with leading scientists and be inspired to be the next global leaders. Let's hear what Jay says about her precious experience in Global Young Scientists Summit (GYSS).

"Global Young Scientists Summit (GYSS) 2019 was held in Singapore. It is a multi-disciplinary summit, inviting PhD students & post-docs from all over the world across all disciplines in science, technology, engineering and mathematics. Being selected as the representative of HKU and the media ambassador of the summit, I was honoured to have the opportunity to interact with eminent world leaders, including Nobel Prize laureates, recipients of Fields Medal, Millennium Technology Prize and Turing Award.

The theme of the summit was "Advancing Science, Creating Technologies for a Better World". To address global issues and cultivate creative solutions, interdisciplinary is an inevitable trend. In the summit, there were plentiful intellectual exchange with scientists and world leaders all around the globe, which were truly inspirational for me. I was also able to share my work and seek advice and ideas from other researchers whom I would not have the chance to converse with in Hong Kong.

The summit was a very rewarding experience. Witnessing the modernity and historical side of Singapore was an eye-opening experience to me; and learning the life lessons from esteemed scientists has inspired me to pursue my dream in science."



Miss Jay J MINUTI

- PhD candidate in Marine Biology, School of Biological Sciences
- Marine Futures Laboratory, Swire Institute of Marine Science (SWIMS)
- HKU representative at the Global Young Scientists Summit (GYSS) 2019 in Singapore

Students' Achievements



BSc students: **Long Hei CHENG, Sing Yuen FONG, Tsz Ching KONG, Tsz Chun SO, Sing Yi WOO, Anthony Chung Tai YEUNG, Nicole YU**

BEd & BSc student:
Lok Yan SIU



<http://bit.ly/2GkEAc7>



Our students from the Ecology & Biodiversity Society and Ecology & Biodiversity Major won the **top prize in the 2nd Sustainable Development Promotion Award for Students of Higher Education Institutions**, organised by the Council for Sustainable Development (CSR) of the HKSAR Government.

Their project "Criss Cross Country Parks" was conferred with The Outstanding Project Award. The Chairman of CSR was impressed with the high standard of the entries, and the wisdom, passion, creativity and commitment among university students.



HKU Three Minute Thesis (3MT) 2019 Competition

Mr Alfred AMRUTH, MPhil candidate of Department of Physics, won the **Championship Award for the HKU 3MT 2019 Competition**, with his topic "Illuminating Dark Matter with Nature's Time Machine". 3MT is an annual academic competition that challenges research postgraduate students to explain their research within three minutes to a general audience.



Ms Sarah Oi Kwan MAK, PhD candidate of School of Biological Sciences, won the **1st runner-up**. The competition helped crystallising her research and strengthening the link between research outcome and humanity.



Ms Ashini Dias MAHADURA, MPhil candidate of School of Biological Sciences, won the **Online People's Choice Award**, with presentation titled "Visualising Evolution: Origin of New Species in Hong Kong".



Two BSc students from Department of Statistics and Actuarial Science, **Ho Yeung WONG and Carrie Siu Chun LO**, are young hackathon enthusiasts and formed a team called "cyda", aiming at leveraging cutting-edge technologies to revolutionise different industries, scooped various awards:

- **Champion in the Deloitte x HKUST hackathon**
- **Champion of TechCrunch Hong Kong Hackathon**
- **Champion of Ontology Task and Grand Prize in the Shenzhen Hackathon**



Won the champion in the "Deloitte x HKUST hackathon" by providing a solution utilising computer vision and blockchain in medical industry



Won the champion of TechCrunch Hong Kong Hackathon



Ms Bingqiu ZHENG, Master of Statistics student in Department of Statistics and Actuarial Science, was awarded the **first prize in the 20th New Concept Essay Contest** for her outstanding performance. The contest, organised by *Mengya Magazine* as well as 14 top universities in mainland China, and supported by Shanghai Association, is one of the most famous competitions in literature and attracted over 90,000 youth writers to enter.



External Awards

Faculty Achievements

Professor Xiaoming YUAN

Professor of Department of Mathematics, was awarded the **2018 Higher Education Outstanding Scientific Research Output Award (Second Prize)** from the Ministry of Education in China, for his outstanding research project (joint with Professor Bingsheng HE from Nanjing University) on "Theoretical and Algorithmic Study on Alternating Direction Method of Multipliers (ADMM)".



Professor Ngaiming MOK

Edmund and Peggy Tse Professor in Mathematics and Chair Professor of Mathematics, was elected as **Fellow of the American Mathematical Society 2019**, for his distinguished contributions to complex differential and algebraic geometry.



Professor Andy HOR

Vice-President (Research) and Chair Professor of Metallic Chemistry & Materials, was elected a **fellow of the European Academy of Sciences (EurASc)**, for his achievements and contributions to academia in the area of structural metallic chemistry.

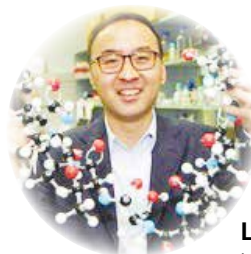


The massive open online course "Dinosaur Ecosystem" designed and instructed by **Dr Michael PITTMAN**, Research Assistant Professor of Department of Earth Sciences, was selected as one of the ten finalists for the **2018 edX Prize for Exceptional Contributions in Online Teaching and Learning** at The edX Global Forum 2018.



Professor Xuechen LI

Professor of Department of Chemistry, was awarded the **Rao Makineni Lectureship (2019)** by American Peptide Society.



Internal Awards

HKU Excellence Awards 2017-18



Professor Alice S T WONG

Professor of School of Biological Sciences, for the Outstanding Teaching Award.



Professor Xuechen LI

Professor of Department of Chemistry, for the Outstanding Researcher Award.



Dr Benjamin R KANE

Assistant Professor of Department of Mathematics, for the Outstanding Young Researcher Award.

Faculty Awards



Dr Michael PITTMAN

Research Assistant Professor of Department of Earth Sciences, received Award for Teaching Innovations in E-learning.



Mr Ting Yu CHAN

MPhil student of Department of Earth sciences, received Award for Excellent Teaching Assistant.



Ms Cindy CHAN

Assistant Director of Communications of Faculty of Science, received Award for Outstanding Professional Services Staff.



Dr Gary Ying Wai CHAN

Assistant Professor, School of Biological Sciences

Research interests: interplay between DNA repair, chromosome segregation and genome instability, mechanism of enzymes involved in DNA repair and segregation

"After the postdoctoral training at the Francis Crick Institute in London, I decided to return to my beloved hometown, studying the interplay between DNA repair and chromosome segregation, which are the two fundamental processes contributing to the fidelity of our genomes. I believe the new knowledge will help us understand how genome instability occurs in cancer cells."



Dr Tak Wing CHING

Assistant Lecturer, Department of Mathematics

Teaching interests: Waring Goldbach problems, sieve methods

"I had my undergraduate and PhD study at HKU. It is my pleasure to pass on my knowledge gained here to the younger generations. I hope more students will find mathematics interesting and will try my best to impart the useful skills to people who are keen on learning mathematics."



Dr Jed Oliver KAPLAN

Associate Professor, Department of Earth Sciences

Research interests: Earth system modelling, climate change, paleoenvironmental reconstruction, human-environment interactions

"After a long career in Europe, I am very pleased to join HKU. My research focuses on the development and application of computer models, studying the interactions between land cover and climate, also the interplay between climate change and society. I am particularly interested in the interdisciplinary study of global environmental history, from the Pleistocene to the Anthropocene."



Dr Rocky LAW

Senior Professional Practitioner, Faculty of Science

Teaching interests: knowledge transfer, start-ups coaching, entrepreneurship network and innovation & entrepreneurship education

"With almost 20 years of experience in university knowledge transfer and consulting business, I realised that one of the major factors leading to the failure of start-ups in HK is founders' mind set. My goal is to help students to found high quality start-ups with better entrepreneurship mind-sets, skillsets and most importantly interdisciplinary founding team members."



Dr Zi Yang MENG

Associate Professor, Department of Physics

Research interests: computational condensed matter physics, large-scale high-performance quantum computations, new paradigms in quantum matter including quantum phase transitions, Non-Fermi liquid, dynamical signatures in novel quantum magnets

"My research interests lie in developing and employing cutting-edge large-scale numerical techniques to discover and understand novel phenomena in quantum many-body models and condensed matter materials beyond the conventional paradigms."



Dr Celia SCHUNTER

Assistant Professor, School of Biological Sciences

Research interests: molecular ecology, population genetics, transgenerational effects, phenotypic plasticity

"I am fascinated by how organisms and populations deal with change. I use genetic, molecular and computational tools to investigate the response as well as long-term adaptations to a change in the environment."



Dr Chenjie WANG

Assistant Professor, Department of Physics

Research interests: condensed matter physics

"It is my great pleasure to join the HKU family. I am a theorist working on condensed matter physics, such as topological phases of matter and quantum transport. My current research focuses on understanding the interplay between symmetry, topology and entanglement in strongly correlated quantum many-body systems."



Dr Gang CHEN

Associate Professor, Department of Physics

Research interests: hard condensed matter theory, atomic molecular optics physics

"Being a condensed matter theorist, I work broadly in various topics of modern condensed matter physics, including quantum magnetism, quantum spin liquid, non-Fermi liquid, topological phases of matter, ultra-cold atoms and molecules, et al. In addition to research works, I emphasise and enjoy the interaction and mentorship with students and postdocs."



Professor Zheng Xiao GUO

Professor, Department of Chemistry

Research interests: materials chemistry, low-dimensional and porous structures for photo- / electro- / chemical catalyses, DFT/MD simulations, hydrogen purification/storage, batteries and fuel cells, sensing and sorption.

"After a long period of studying and working in the UK, from Manchester (PhD), Oxford (PDRA), to London (Lecturer to Professor), I decided to join another institute of excellence – HKU, to make new friends, tackle new challenges and create impact in science and society."



Dr Dong Keun KI

Assistant Professor, Department of Physics

Research interests: quantum coherence and correlations effects in low-dimensional electronic systems

"I am an experimental physicist who eagerly searches for new physical phenomena that originate from quantum nature of electrons, particularly in graphene and 2D materials, as their atomic thicknesses greatly enhance such quantum effects and allow us to explore, and even engineer, the new quantum phenomena."



Dr Wentao LI

Assistant Professor, Department of Statistics and Actuarial Science

Research interest: bayesian inference, computational statistical methods, nonlinear dynamical system

"After studying in USA and working in England, it is exciting to return to Asia. Standard statistical methods face great challenges currently, and the emergence of computational statistics has a strong liberating influence on analysing complex model and non-standard data. My goal is to develop a new generation of statistical tools to aid scientific breakthroughs in the data revolution."



Dr Takashi NAKAGAWA

Associate Professor, Department of Earth Sciences

Research interest: geophysics and planetary physics

"My research aims to reveal how the Earth can be the habitable planet based on the Geophysical Fluid Dynamics applied for dynamics and evolution of the planetary system from deep interior to surface environment with high-performance computing and theoretical approaches."



Dr Edmund Chun Ming TSE

Assistant Professor, Department of Chemistry

Research interests: electrochemistry, inorganic, biomaterials

"I received my postdoctoral training at Caltech and my PhD degree at UIUC. My research focuses on designing hybrid electrocatalytic platforms for renewable energy applications, governing the selectivity of reaction products for sustainable process technologies, and identifying unknown redox-active proteins as new biomarkers for early detection of cancer and infectious diseases."



Dr Jin WU

Assistant Professor, School of Biological Sciences

Research interests: plant physiology ecology, ecosystem ecology, biogeochemistry, global change, satellite remote sensing, vegetation spectroscopy, and Earth system modeling

"My research seeks to understand the causes, consequences and mitigations of climate change problems. I use ecological, ecophysiological, and evolutionary theories as my scientific guidance, while assimilating cutting-edge space technology, mathematical modeling, and high performance computing to help achieve these goals."



Dr David Hoi Fung YU

Assistant Lecturer, Faculty of Science

Research interests: gamma-ray bursts, pulsars, compact objects and bayesian astrostatistics

"I am an astrophysicist and science communicator from Hong Kong. I did my PhD degree at the Max Planck Institute for Extraterrestrial Physics in Germany and postdoctoral research at the Royal Institute of Technology in Sweden. My goal is to become a scientist who is capable in high-quality research, teaching, and science literacy."



Dr Chaogu ZHENG

Assistant Professor, School of Biological Sciences

Research interests: developmental neurobiology, genetics, genomics, neurodegeneration and regeneration, evolutionary biology

"My goal is to understand the organising principle of the nervous system by investigating the molecular mechanisms of cell fate decisions, subtype diversification, neuronal morphogenesis, and circuit assembly in a model organism called *C. elegans*. I am also interested in modelling neurodegenerative diseases and studying how bacteria-neuron interaction affects neurodegeneration in the host."

Alumni Corner

HKU Science Alumni Association (HKUSAA) has organised a few tours in late 2018 and 2019, allowing alumni to take a break from the busy urban life, and to experience the beauty of nature and revisit the history of our city. A spa & guided tour was taken place at T · PARK on November 17, 2018; and a Mai Po nature reserve tour was held on January 26, 2019, with Dean Evans as the guest eco-guide. They also went to Long Valley for an eco- & heritage tour on April 13, 2019.

Apart from these relaxing activities, a career dialogue exchange was also held on March 1, 2019 with Science Society, HKUSU, to gear Science students up for their future career via the exchange with Science alumni. Stay tuned for more in second half of 2019!



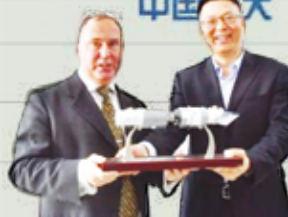
News

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In October 2018, The Laboratory for Space Research (LSR) of The University of Hong Kong, announced its plan to immediately establish a new **LSR at HKU Zhejiang Institute of Research Innovation (HKU-ZIRI)** in Hangzhou. With a strategic investment of HKD 10 million, the laboratory is designed to help put Space and Planetary Sciences and related activities squarely on the map at HKU.

Later in March 2019, LSR delegation opened an avenue for collaboration with the Mainland National Astronomical Observatories. Access was gained to mainland national observatory facilities for the entire Hong Kong astronomer community.



April
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Dean EVANS and Director General of SIMM Professor Jia LI signed a **Memorandum of Understanding on Cooperation** in Shanghai on April 18, 2019. The agreement does not only foster research collaborations and joint laboratory establishment, but also enhance students' learning experience by offering student exchange opportunities and joint training at graduate levels.



March
2019
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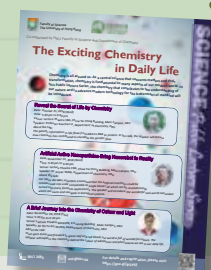
Two Endowed Professorships of Faculty of Science were inaugurated on March 20, 2019. We congratulate **Professor Hongzhe SUN** for their being conferred of the "**Norman and Cecilia Yip Professorship in Bioinorganic Chemistry**", and **Professor Guosheng YIN** on succeeding "**Patrick S C Poon Professorship in Statistics and Actuarial Science**".



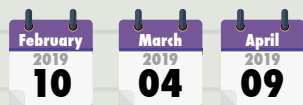


A series of public lecture titled **"The Exciting Chemistry in Daily Life"** was held on October 31, November 14 & 29, 2018, with **Professor Xuechen LI, Dr Jinyao TANG and Dr Ho Yu AU-YEUNG**

of Department of Chemistry as the speakers, introducing the chemistry that contributes to the understanding of our nature and to advance modern technology for the betterment of mankind.



Curated and led by **Dr Billy HAU**, the HKU Foundation and the Faculty of Science will co-present an **East-Africa Wildlife Eco-tour** in July 2019. At this fireside chat, Dr Hau and his former students shared their ecological teaching and learning experiences, and gave a preview of this eye-opening and exciting trip.



In light of Oak Anniversary, three distinguished alumni, **Dr Patrick S C POON, Mr Chiu Ying LAM, Mr Wing Luk CHAN (Uncle Six)**, were invited

to share their walks of life and precious experience with Science family and the general public in our **Dialogue Sessions with Distinguished Alumni**. The dialogue sessions demonstrated how they utilise their knowledge, analytical skills and scientific mind set to explore and achieve goals and visions, as well as their insights in career and professions, university education and Hong Kong's societal development.



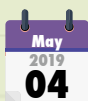
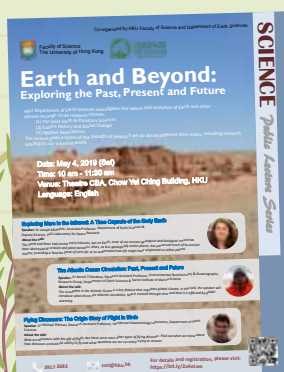
Dr Patrick S C POON



Mr Chiu Ying LAM



Mr Wing Luk CHAN (Uncle Six)



A public lecture "Earth and Beyond: Exploring the Past, Present and Future" was held on May 4, 2019. With **Dr Joseph MICHALSKI, Dr Benoit THIBODEAU and Dr Michael PITTMAN** from Department of Earth Sciences, the lecture gave a taste of the breadth of research we do across different time scales, including research relating to our warming world.



HKU Science Faculty website won **Award of Distinction in The Communicator Awards 2019** – a leading international awards programme founded over two decades ago. The new Faculty website aims to present a fresh look with global and international image, simultaneously serves as a user-friendly gateway for visitors to better understand our commitment in teaching and research.



Acknowledgement

We would like to express gratitude to our donors for their recent support, which is paramount for us to grow and scale new heights.
(in alphabetical order)

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- Professor Kwan Ming CHAN and Mrs Karen Kung Mei CHAN LAK
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